University of Nevada Cooperative Extension

PEER REVIEWED

Special Publication 14-06

The Lander County Sustainable Development Committee – Transforming a Community

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This case study of the Lander County Sustainable Development Committee has been completed as part of the five-task requirement of a 2008-2009 grant from the U.S. Bureau of Land Management in support of the Future Industrial Needs Discovery (FIND) Project. Task 5 “Development of a FIND case history summary publication” represents the final task of the FIND Project.

The Lander County Sustainable Development Committee – Transforming a Community

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Executive Summary

In February 2013 Lander County and the Lander Economic Development Authority contracted with University of Nevada Cooperative Extension to complete this case study of the Lander County Sustainable Development Committee and the Future Industrial Needs Discovery (FIND) Project as part of Task 5 of a U.S. Bureau of Land Management grant. Using the Logic Model, as developed by Ellen Taylor-Powell, as this case study's primary methodology, several key inputs and outputs and several key outcomes and impacts associated with the Lander County Sustainable Development Committee and the FIND Project are identified in this case study. The purposes of this case study are:

- To celebrate and document the accomplishments of the Lander County Sustainable Development Committee.
- To develop important lessons learned and best practices.
- To provide a record of the Lander County Sustainable Development Committee's efforts and the impacts of the FIND Project for the U.S. Bureau of Land Management so that those lessons learned and best practices can be shared with other communities throughout the United States.

Key inputs associated with the Lander County Sustainable Development Committee's efforts include: (1) development of the Gold Belt Coalition, (2) organizational development of the Lander County Sustainable Development Committee and (3) a 2008-2009 grant from the U.S. Bureau of Land Management.

Key outputs associated with the Lander County Sustainable Development Committee's efforts include: (1) the FIND Project, (2) the Renewable Energy Development Feasibility study, (3) the Battle Mountain Business Enhancements Program and (4) the Lander County Housing Gap Analysis. Two additional outputs associated with the efforts of both the Lander County Sustainable Development Committee and the Lander Economic Development Authority include: (5) the 2009 Lander County Comprehensive Economic Development Strategy; and (6) the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan.

Key outcomes associated with the Lander County Sustainable Development Committee's efforts include: (1) an increase in regional networked development; (2) an increase in collaboration, trust, and reciprocity; and (3) the increased use of "tool" development and data-driven policy, program, and project development.

Key impacts, especially long-term impacts, of the Lander County Sustainable Development Committee's efforts are still difficult to ascertain. According to employment by industry category data provided by the U.S. Census Bureau, Lander County still remains dependent on mining and natural resource extraction as its primary employment industry. Between 2007 and 2011, according to U.S. Census Bureau American Community Survey data, agriculture, forestry, fishing and hunting, and mining accounted for 38.3 percent of Lander County's total annual employment, the single largest employment category in Lander County. Comparatively, agriculture, forestry, fishing and hunting, and mining accounted for just 1.5 percent of total statewide annual employment in Nevada between 2007 and 2011.

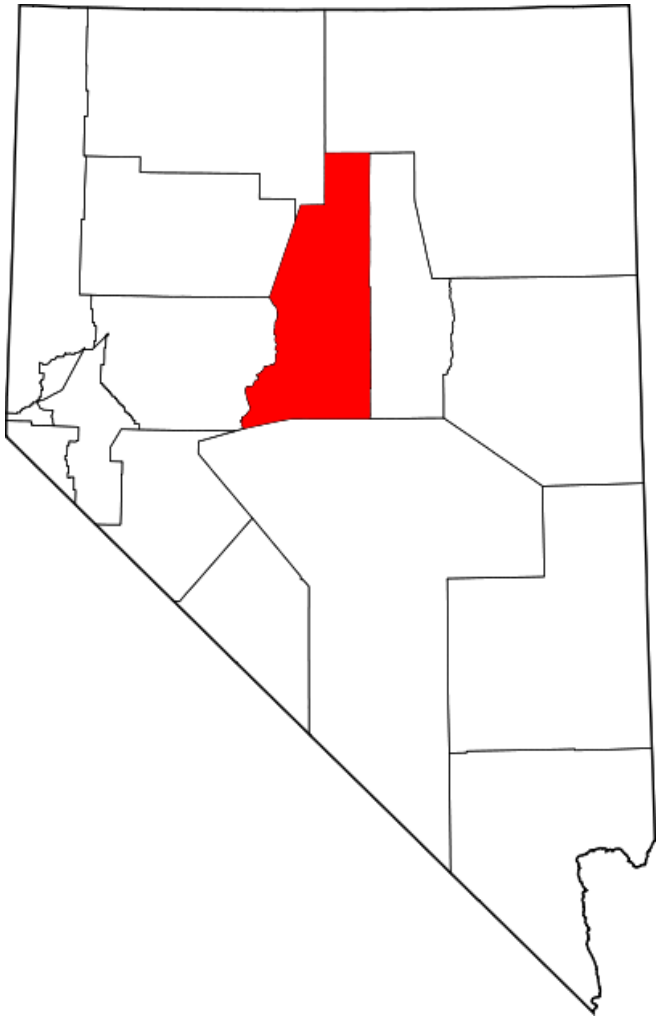
The lack of sizable and measurable long-term impacts should not be taken as a measure of failure of the Lander County Sustainable Development Committee. To the contrary, the Lander County Sustainable Development Committee has shouldered the primary responsibility, since its formation in 2005 as part of the Gold Belt Coalition, for economic development and diversification in Lander County. The Lander County Sustainable Development Committee has laid a strong foundation upon which the county and organizations such as the Lander Economic

Development Authority are beginning to build several long-term economic development policies, programs and projects designed to diversify and develop a sustainable economy in Lander County.

Introduction and Overview of the Lander County Sustainable Development Committee

Founded in 1861 and named after Frederick W. Lander, Lander County (highlighted in Figure 1) is centrally located in the State of Nevada and is surrounded by Churchill County and Pershing County to the west, Humboldt County to the northwest, Elko County to the north, Eureka County to the east, and Nye County to the south.

Figure 1 – Lander County



Lander County's unincorporated towns consist of Battle Mountain (the county seat), Austin, Galena, Kingston, Pittsburg and Rixie. In 2010, according to the U.S. Census Bureau, the countywide residential population was 5,775 people with a 2010 median household income of $46,067 and a 2010 median family income of $51,538.

According to the Lander County Sustainable Development Committee's website (2013), "Sustaining the long-term economic health of Lander County is the goal of the multi-faceted Lander County Sustainable Development Committee. In simple terms, the goal is to end the boom and bust cycle that is typical of Nevada's rural communities which have been tied to extraction of natural resources and those commodity prices since turning from territory to state. By reaching out to all walks of life in Lander County, the Sustainable Development Committee is helping shape a new future vision with the region's residents."

Lander County, like many rural communities across the United States that have relied heavily on resource extraction (mining) as their primary economic base, has learned the hard way that economic diversification is critical to ensuring long-term economic stability. Many rural communities that rely heavily on resource extraction suffer the economic highs and lows of a boom-and-bust cycle that can change the fortunes of a community in an instant because of global and national forces the ability of that community's control.

The Lander County Sustainable Development Committee (LCSDC) was initially conceived of as part of a larger coalition in 2003, the Northeastern Nevada Partnership, which initially consisted of the LCSDC, the Northern Nevada Partnership (Elko) and the Humboldt-Pershing Sustainable Development Partnership. According to the Northern Nevada Partnership (2007) website, the Gold Belt Coalition was a collaborative regional effort with the goal of fostering solutions for long-term regional sustainability in the central-northeastern part of Nevada where mining was

the region's primary economic base. Under the Gold Belt Coalition partnership, each of the three organizations, the Northern Nevada Partnership, the Humboldt-Pershing Sustainable Development Partnership and the LCSDC, would work together to accomplish the following four primary efforts:

1. Develop collaborative associations for educational and informational exchange.

2. Coordinate local partnerships to explore post-mine use of facilities. This would be done using, in part, mine site databases from across the region describing mine site and regional infrastructure suitable for industrial uses and/or regional planning application, known as the FIND Project (Future Industrial Needs Discovery).

3. Promote community capacity for engaging with public land agencies in resource management planning processes as they relate to community sustainability.

4. Advance synergies for community sustainability through activities such as recycling, developing healthy rangeland ecosystems, alternative energy projects and others.

The beginnings of the Northeastern Nevada Partnership, and ultimately the LCSDC, started with a two-day workshop that was held in November 2003, hosted and sponsored by the Northeastern Nevada Stewardship Group. This two-day workshop brought together several different interest groups, including government interests from the federal, state, and local levels, mining companies, engaged citizens and community leaders, conservation groups, and others that had a vested interest in the long-term sustainability and viability of the central-northeastern part of Nevada.

After 2003, as part of a series of follow-up workshops, the LCSDC was formed in 2005. Then the Humboldt-Pershing Sustainable Development Partnership was later formed in 2007. Joining with the Northern Nevada Partnership, these three organizations formed the Gold Belt Coalition. Ultimately, each community group; Elko, Humboldt and Pershing counties; and Lander County, would work to pursue their own specific interests and agendas with respect to their own needs. However, each of the three organizations agreed to work collaboratively with each other, through the Gold Belt Coalition, on issues that transcended established political and county boundaries and borders. As early as 2003, and then again in 2005 and 2007, each of the four counties that joined to eventually form the Gold Belt Coalition understood the need to work collaboratively within a regional service delivery provider network to achieve regional goals within the central-northeastern part of Nevada that could not be achieved through traditional command-and-control bureaucratic hierarchies that have dominated the delivery of public services since the late 1800s and early 1900s in the United States.

Collaborative and regional service delivery provider networks have become popular responses to complex problems faced by the public sector. Daniel Mazmanian, Richard Callahan and Frederick Steinmann have each explored the potential benefit of collaborative and regional provider networks in the delivery of public services and in the solving of complex problems that transcend traditional political borders. Mazmanian explores the use of networks in environmental protection using the Southern California Air Quality Management District as a case study. Callahan recounts the use of networks in overcoming conflict in the development of mass transportation and the Alameda Corridor project in Los Angeles County. Steinmann examines the use of networks in collaborative approaches to regional economic development and urban revitalization in Nevada and California.

<u>Sustainable Development – Lessons From the Experience of the REgional CLean AIr Market (RECLAIM)</u>

Daniel Mazmanian, in his book "Los Angeles' Transition from Command-and-Control to

Market-Based Clean Air Policy Strategies and Implementation", traces the historical development of environmental policy and sustainable development through each of the three national environmental epochs. The first environmental national epoch was defined by a command-and control approach in which the federal government set policy and emission-reduction targets and state and local governments were required to comply. State and local governments were given increasing amounts of flexibility in setting emission reduction targets during the second environmental national epoch. The third and current national epoch is defined by the use of market-based approaches at the regional level. Mazmanian's work demonstrates the importance of taking into account local variation. In-terms of environmental policy, these local variations include emission levels, weather patterns, differences in lifestyles and individual susceptibility to different pollution levels, all of which need to be taken into consideration when crafting complex sets of public policy.

In dealing with air pollution, Mazmanian (1999) argues that, "From the outset of the battle against air pollution, the political challenge of policymakers has been to achieve a balance between reductions in emissions unequivocally required by law and population and economic growth at the heart of the region's prosperity." This approach, in trying to balance environmental and economic needs, was a hallmark of the second epoch of national environmental policy in the United States. But due to a series of forces including the national recession of the early 1990s and a changed political climate in California that became more conservative, wariness of state and local government officials to add new regulatory burdens, and continued political turnover of the Southern California's Air Quality Management District (AQMD) appointed board of governors, a new market-based approach to air quality management and regulation in Los Angeles began to develop.

In discussing the development of the third epoch of environmental policy in the United States, Mazmanian (1999) argues that, "Market incentives, which received just passing mention in 1991, were the new plan's center-piece. Nearly one hundred programs were included. A new implementation plan was declared, aimed at 75 percent of all smog-causing activities: fees on car miles driven and on fuel consumption; credits and rebates for cleaner technologies; financial incentives to switch to electric or low-emitting vehicles and fuel-cell vehicles; expansion of RECLAIM (REgional CLean AIr Market) to 1,200 industrial facilities; the planting of shade trees to reduce peak summer heat." Central to this new approach was a series of various policies, programs and projects, instead of just one approach, and the desire of policymakers to bring together different stakeholders to develop, implement, and administer those policies, programs and projects within a wider regional network.

As it pertains to sustainable development, Mazmanian (1999) argues that the AQMD's and RECLAIM's efforts to develop a series of comprehensive policies, programs and projects and to develop, implement and administer them regionally within a large stakeholder network is central to the effort of developing sustainable communities. Whether or not it is environmental policy, transportation policy or economic development policy, successful sustainable development can only be achieved when policymakers, practitioners and stakeholders work collaboratively and comprehensively. It is this point that most closely echoes the experience of the LCSDC acting both within and then independently of the Gold Belt Coalition. Since its formation in 2005, the LCSDC has worked to form large coalitions of business leaders, mining interests, agricultural interests, political interests and many other interests including the general public, to develop, implement and administer sustainable development-oriented policies, programs and projects at both a regional and countywide level.

A wide variety of policies, programs and projects, ranging from comprehensive projects, such as the Future Industrial Needs Discovery (FIND) project, to select and target projects, such as a community beautification program for Battle Mountain, Nev., have been championed and developed by the many stakeholder partners that comprise the current LCSDC and the regional sustainable development network it has helped create and grow.

Embracing Conflict – Lessons From the Experience of the Alameda Corridor Transportation Authority (ACTA)

But conflict, even despite the best intentions of the network participants and despite the most noble of reasons, is inevitably going to challenge the ability of the network to effectively develop, implement and administer policies, programs and projects designed to achieve specific outcomes. Richard Callahan examines the success of three different approaches to the development of transportation in Los Angeles County between 1978 and 2002. In doing so, Callahan (2007) concludes that "What emerges is an untold story of American politics: the evolution of mechanisms that promote cooperation. Four findings emerge: (1) conflict is inevitable; (2) public agencies can succeed despite the problems of politics; (3) successful regional solutions are intensely local; and (4) cooperation emerges from supply-side mechanisms that create new resources rather than reallocate existing resources."

Between 1978 and 2002, three different public agencies each built regional rail projects throughout Los Angeles County. The Los Angeles County Transportation Commission (LACTC), the Los Angeles Metropolitan Transportation Authority (MTA) and the Alameda Corridor Transportation Authority (ACTA) were each an experiment in regional governance. According to Callahan (2007), "The Los Angeles County Transportation Commission (LACTC) offers a case study in politics designing conflict into the structure of an agency from the start." Eventually, the LACTC was merged with the Southern California Rapid Transportation District to form the Los Angeles Metropolitan Transportation Authority (MTA). The initial inclusion of conflict into the design of the LACTC remained a prominent design feature of the MTA. Although the MTA would prove to become financially insolvent due to a series of poor financing decisions, the inclusion of conflict into the design of the LACTC and then the MTA became a critical component of the Alameda Corridor Transportation Authority (ACTA) as well.

Callahan (2007) points out that, "The state and local elected officials who designed each of the three agencies – the LACTC, MTA, and ACTA – were well versed in politics. The politics included choices about representation on the governing boards, the agencies' respective missions, and the authority provided to each agency. The evolution of each agency reveals the impact of politics." Here, again, are echoes of the experience of the Gold Belt Coalition and, later, the LCSDC. The founders of the Gold Belt Coalition and then the LCSDC consciously and purposefully chose to involve many disparate and historically hostile groups in the development of both regional collaborations. Various business interests; mining interests; agricultural interests; federal, state, and local political interests; and the general public at-large were each invited to participate in the creation of sustainable development policies, programs and projects that would be implemented and administered through both the Gold Belt Coalition and the LCSDC.

Although these various interests have historically chosen conflict over collaboration, and have often sought to disrupt or inhibit the other's efforts altogether, the founders of the Gold Belt Coalition and the LCSDC purposely included these various interests at the start, as opposed to allowing one group or one interest to dominate the early stages of development. Callahan (2007) points out that, "The impact of political considerations (or conflict) on the

design of new public agencies is central to the framework that Terry Moe calls the *politics of structural choice*. Moe starts with the premise that public agencies are not designed to be efficient: 'Because American politics is unavoidably a process of compromise, then, public agencies will tend to be structured in part by their enemies – who want them to fail.'"

Regional, self-organizing collaborative efforts that are similar to the Gold Belt Coalition and the LCSDC tend to exhibit five predominant features, including:

1. Adaptation, whereby agencies rely on local autonomy to craft solutions, with significant participation from all appropriators.

2. Credible commitment, with an expectation among participants that any commitment to future allocations will be honored.

3. Conflict resolution, with grievance processes that respond to allocation, equity, enforcement and other concerns among all those sharing the resource.

4. Credible enforcement, which prevents overappropriation by any one user or group of users and the depletion of the shared resources.

5. Effective monitoring of the resources with an agreed-upon, neutral source of reliable information.

Each of these five features are evident in the efforts of the LCSDC to develop, implement and administer a wide variety of sustainable economic development policies, programs and projects throughout Lander County. Even though the LCSDC was initially part of the Gold Belt Coalition and works countywide, and has even worked in parts of neighboring Eureka County including the unincorporated town of Crescent Valley, parts of Humboldt County including surveys of the infrastructure associated with the Lone Tree mine, and individual communities such as Austin and Battle Mountain in Lander County, each individual community has the freedom to adapt the policies, programs and projects developed by the LCSDC partnership to fit its own local needs.

A primary reason for the LCSDC's short-term and medium-term success, and its longevity since its formation in 2005, has been the commitment of its members to the shared goals of breaking the boom-and-bust economic cycle Lander County had historically been subjected to and to put Lander County on a path of long-term sustainable growth. A strong shared commitment to conflict resolution among the various partners within the LCSDC framework is a second reason for the LCSDC's short-term and long-term success. Members and partners are encouraged to deliberate issues using either interpersonal methods, such as email, telephone calls or in-person meetings, or the public meeting process through regular meetings of the LCSDC and the Lander Economic Development Authority.

Collaborative management of the LCSDC's resources, and the resources of other agencies and entities such as Lander County and the Lander Economic Development Authority, is clearly evident in the minutes of each group's public meeting. Finally, the LCSDC and its members have relied heavily on the University of Nevada, Reno; the University of Nevada Center for Economic Development; and University of Nevada Cooperative Extension as neutral sources of reliable information. This information, including the development of a comprehensive housing study and a business plan for the town of Battle Mountain in Lander County, has helped guide and shape sustainable economic development policy since the LCSDC's formation in 2005.

<u>Regional and Complex Approaches to Economic Development – Lessons From the Redevelopment Era in Nevada and California</u>

In evaluating the historical success of current urban economic development efforts in Nevada and California, and the reliance of local governments in both states on the use of

redevelopment as a primary economic development and urban revitalization tool, Steinmann (2010) outlines five major criticisms of redevelopment, including:

1. Property-based economic development strategies are insufficient to meet the goals of urban revitalization and urban economic development.

2. Local redevelopment agencies lack a regional focus, and without a regional focus, true local economic development is unattainable.

3. Redevelopment's role in the "fiscalization of land use" undermines true local economic development.

4. The use of eminent domain by local redevelopment agencies has limited ability and authority to revitalize neighborhoods.

5. Redevelopment is subject to principal-agency corruption, thereby retarding true local urban revitalization efforts.

Relying on past scholarly work done by the American Planning Association (APA) and the International Economic Development Council (IEDC), Steinmann (2010) concludes that each of these five criticisms of redevelopment have inhibited the ability of local governments in Nevada and California to reach five primary goals of local economic development, including (1) creating mid-to-high skill level jobs that (2) pay mid-to-high level wages and (3) offer individuals opportunity for general upward mobility while (4) improving a community's overall quality of life and (5) helping to stabilize locally collected tax revenues. The first two criticisms listed above, that property-based approaches alone are insufficient and that a lack of a regional focus makes each of these five goals of local economic development unattainable, have broad applicability to the efforts of policymakers and economic development professionals in both the rural and urban environments.

First, Steinmann (2010) argues that since the end of federal urban renewal policies in the 1970s and 1980s, local governments in Nevada and California have over-relied on property-based approaches to economic development. Using institutional approaches such as redevelopment, local governments have, for the past 30 to 40 years, pursued programs, policies and programs designed to fix the physical aspect of the built environment and local or regional economy without equally addressing the nonproperty-based conditions of their community, such as the development of new technologies and innovation, the quality of a community's workforce, the development of new small businesses and entrepreneurial efforts, the broad marketing of their communities, or other aspects pertaining to neighborhood and community conditions.

Steinmann (2010) states that, "Local redevelopment agencies have increasingly moved away from a broad approach designed to diversify a local economy and have increasingly turned to either commercial-retail development or tourism development through the financial subsidy of large hotels and convention centers." In examining the consequences of this dominant orientation toward economic development, Fulton and Shigley (2005) find that, "Given this narrow purpose, redevelopment cannot by itself hope to solve California's urban problems. It cannot prevent crime. It cannot eradicate drug abuse. It cannot keep troubled kids in school and give them the training they need to become productive citizens."

Although Lander County has never and does not currently have an active redevelopment agency, the conclusions arrived at by Steinmann (2010) and Fulton and Shigley (2005) regarding the pitfalls of over-reliance on the use of property-based approaches to economic development are just as applicable to Lander County as to any other urban or rural community anywhere in Nevada and California. Although the LCSDC has, since its formation in 2005, been most focused on property-based issues and projects, such as the Future

Industrial Needs Discovery (FIND) project, the LCSDC has directly supported the development of a complex economic development network within Lander County and throughout the region with partners outside Lander County. Moving forward, Lander County and the LCSDC, through organizations like the Lander Economic Development Authority, will have to ensure that nonproperty-based approaches, alongside traditional property-based approaches, to economic development are employed.

Second, Steinmann (2010) argues that many local governments in Nevada and California have failed to take into account the need to organize local economic development policies, programs and projects at the regional level. According to Steinmann (2010), "Local communities and local municipal and county governments are increasingly finding that their future economic prosperity is tied directly to the economic futures of wider regions that transcend local municipal and county political boundaries…the economic development policies, programs, and services that local municipal and county governments continue to deliver remain fundamentally grounded in the belief that their efforts should only concentrate on the local issues within their political boundaries."

The failure to organize and act regionally typically means that local governments are not matching their efforts to the realities of how markets organize themselves in the present day. Presently, markets tend to organize regionally and often ignore political boundaries. According to Porter (1998), "Now that companies can source capital, goods, information, and technology from around the world, often with the click of a mouse, much of the conventional wisdom about how companies and nations compete needs to be overhauled. In theory, more open global markets and faster transportation and communication should diminish the role of location in competition."

Steinmann's (2010) and Porter's (1998) observation regarding the importance of organizing local economic development policies, programs and projects regionally is an observation that helped guide much of the LCSDC's initial efforts following its formation in 2005. As already stated, the LCSDC was initially formed as part of the Gold Belt Coalition, a partnership of Humboldt and Pershing counties, Lander County, and Elko County. Although not a formal partner of the Gold Belt Coalition, Eureka County and members of the Eureka County Economic Development Program Board were active participants in the early development of the LCSDC and, especially, the FIND Project. The overall goal of the Gold Belt Coalition was to foster solutions for long-term regional sustainability where mining is the region's primary economic base. As a member of the Gold Belt Coalition, the LCSDC would seek to end the boom-and-bust cycle that is typical of Nevada's rural communities, which have historically been tied to the extraction of natural resources and those commodity prices since turning from territory to state.

Although the LCSDC continues to operate largely independently of its initial Gold Belt Coalition partners, the regional legacy of the Gold Belt Coalition is still present in the current efforts of the LCSDC to organize and implement its economic development policies, programs and projects at a regional level. As part of the State of Nevada's reorganization of statewide economic development efforts, undertaken in the 2011 session of the Nevada State Legislature in Nevada Assembly Bill (AB) 449, Lander County and the LCSDC, through the Lander Economic Development Authority, are currently working with Eureka County, and the Eureka County Economic Development Program, White Pine County and the White Pine County Department of Community & Economic Development to create the Great Basin Regional Development Authority. The Great Basin Regional Development Authority will have the ability to develop, implement and administer a wide range of property-based and nonproperty-based economic development programs, polices and projects at the regional level.

Since its founding in 2005, the LCSDC has had a significant impact on the economic development programs, policies and projects that have helped shape the economic fortunes of Lander County and the region. The LCSDC was an early adopter of a regional model of economic development focused on economic diversification through a series of property-based and nonproperty-based approaches. The ability of the LCSDC to build conflict resolution into its administration, as a way of building trust and reciprocity among LCSDC members, has contributed significantly to the ability of the LCSDC to develop and implement economic development and diversification initiatives collaboratively. Although the LCSDC's long-term impact on Lander County has yet to be determined, the LCSDC has already had significant short-term and mid-term impacts on the county's and region's economic fortunes. Most importantly, the LCSDC has helped focus county efforts on data-driven development of policy. As a result, the county and key stakeholders now appreciate the need to diversify the county's and region's overall economic base away from natural resource extraction and mining toward a sustainable economic base that can reliably provide mid-to-high-skill level jobs that pay mid-to-high level wages that offer individuals meaningful opportunities for general upward mobility and improve the community's overall quality of life and help stabilize locally collected government revenues.

This case study examines the history of the Lander County Sustainable Development Committee and its contribution to the understanding of community and economic development. The following section outlines the methodology used to develop this case study. The next two sections explore the importance of new organizational structures for governance and different typologies, approaches, and issues relating to rural economic development in the 21st century. The final three sections present a detailed discussion of the Lander County Sustainable Development Committee; important lessons for future development, learning and research learned from the activities of the LCSDC; and some final conclusions.

Methodology

The case study of the Lander County Sustainable Development Committee and the efforts undertaken since the early part of the 2000s to diversify the Lander County economy utilizes a traditional case study methodology. The Logic Model, as developed by Ellen Taylor-Powell, evaluation specialist with the University of Wisconsin-Extension, is used to identify the key inputs and outputs and short-term, medium-term and possible long-term impacts associated with the LCSDC.

This section provides a brief description of the Logic Model, a general overview of the case study, the types of data, including both qualitative and quantitative, that were collected, and how that data was analyzed using the Logic Model.

The Logic Model

According to Taylor-Powell, Jones and Henert (2003), the Logic Model is used to answer three primary questions regarding the performance of programs developed and implemented by Extension faculty, including:

1. Where are you going?

2. How will you get there?

3. What will tell you that you have arrived?

The Logic Model is described by Taylor-Powell, Jones and Henert (2003) as:

- A simplified picture of a program, initiative or intervention that is a response to a given situation.

- A "program theory" or "theory of action" that shows the logical relationships among the resources that are invested, the activities

that take place, and the benefits or changes that result. It is a "plausible, sensible model of how a program is supposed to work." The Logic Model is designed to portray the underlying rationale of the program or initiative.

- The core of program planning, evaluation, management and communications. While some believe that the Logic Model is only used in evaluation, Taylor-Powell, Jones and Henert (2003) argue that the Logic Model can be equally helpful for planning and program design, managing programs and communicating important program outcomes and impacts.

It is these three elements of the Logic Model that are most relevant to developing a proper methodology for studying and evaluating the LCSDC. As indicated in the introductory section, the LCSDC was initially conceived of in 2003 in response to the continued boom-and-bust cycle of the Lander County economy due to international and national fluctuations in the price of precious metals, namely gold, that Lander County could not control. This situation, the continued boom-and-bust cycle, led to the development of the Gold Belt Coalition, a program designed to promote economic diversification across several counties in the central-northeastern part of Nevada.

The LCSDC, once separated from the Gold Belt Coalition of central-northeastern Nevada counties, was the program community leaders in Lander County used to begin the process of diversifying the Lander County economy. The Logic Model provides a rational way of evaluating the LCSDC relative to the stated goal of diversifying the Lander County economy by identifying key actions and the resources invested by the LCSDC in pursuit of this goal since its formation in 2005.

Finally, the Logic Model in this case study is used to identify (1) the key inputs and outputs associated with the LCSDC and (2) the short-term, medium-term and potential long-term outcomes and impacts of those inputs and outputs. Task 5 of the initial Phase II part of the Future Industrial Needs Discovery (FIND) Project, labeled Project History, requires the LCSDC; the Lander Economic Development Authority; and the University of Nevada, Reno; to write and publish a project history in order to document the FIND Project process and identify both successful and unsuccessful components of the project. The Logic Model provides a clear, rational and concise way of completing this fifth task associated with the initial Phase II component of the FIND Project grant that supported development of the LCSDC.

Overview of the Case Study

The case study presented in this special publication is organized using the various components of the Logic Model outlined above. The next two sections, "Organizing Community and Economic Development in the 21st Century and Embracing Complexity" and "Rural Economic Development in the 21st Century – Typologies, Approaches, and Issues in the Rural Environment", provide a general overview of the issues pertaining to community and economic development in communities like Lander County.

The next section, "The Lander County Sustainable Development Committee – A Regional Approach to Comprehensive Rural Community and Economic Development", provides a thorough summary of the LCSDC, including its general background; formation; budgetary overview; and ultimate policy, program and project development. This section also summarizes key inputs and outputs associated with the LCSDC and key associated outcomes and impacts.

The final two sections, "Lessons for Future Development, Research and Learning" and "Conclusion", summarize some final points regarding the LCSDC.

Although the Logic Model is used to organize the research and findings of this case study, a true research methodology is needed to guide

those efforts and findings. Action research, as defined by Ernest Stringer (2007), is used because of (1) the familiarity of the authors of this case study with the use of action research approaches, and (2) its applicability to this type of case study that emphasizes the importance of specific situations that the people in Lander County dealt with relative to the boom-and-bust cycle of precious metal and mineral prices and the need to develop localized solutions to address these issues. According to Stringer (2007), "Action research is a systematic approach to investigation that enables people to find effective solutions to the problems they confront in their everyday lives. Unlike traditional experimental/scientific research that looks for generalizable explanations that might be applied to all contexts, action research focuses on specific situations and localized solutions."

The action research methodology follows three general steps: (1) look, (2) think and (3) act. "Look" involves gathering relevant information and data with the goal of building a picture that defines and describes the situation. "Think" involves exploring and analyzing the data and situation. Stringer (2007) argues that "What is happening here?" and "How/why are things as they are?" are part of the analyzing and theorizing that takes place during the "think" phase of action research. "Act" includes planning and reporting, implementing, and evaluating. Finally, he concludes that, "Although the 'look, think, act' routine is presented in a linear format throughout, it should be read as a continually recycling set of activities" (Stringer, 2007). Action research is based on a repeating loop of looking, thinking and acting in order to effectively understand the unique situations and localized solutions used to address those unique situations.

Given the unique set of situations and circumstances that Lander County faced, and to some degree still faces, the action research methodology is best suited to guide and structure this case study using the Logic Model format.

Data Collection and Availability

The "look" stage of the action research methodology was used to structure the data collection and availability part of this case study. According to Stringer (2007), "The primary objective of the 'Look' stage of the process is to gather information that will enable researchers to extend their understanding of the experience and perspective of the various stakeholders – those mainly affected by or having an influence on the issue investigated."

Data collection involved a comprehensive examination of approximately eight years of documents including budget reports, meeting agendas and minutes, emails, technical reports, presentations, and a variety of other supporting material. A total of 675 documents were reviewed, sorted and categorized. Major categories, using the Logic Model's definition of key inputs and outputs, short-term outcomes and impacts, medium-term outcomes and impacts, and long-term outcomes and impacts, were used to sort and categorize the 675 documents pertaining to the LCSDC's past and current activities. Once reviewed, sorted and categorized, a short summary of each document was generated and used to write the section "The Lander Sustainable Development Committee – A Regional Approach to Comprehensive Rural Community and Economic Development."

Data availability, including both qualitative and quantitative, was relatively high. As part of the U.S. Bureau of Land Management grant that funded the initial forming of the LCSDC, Rodney Davis, Extension educator and associate professor with University of Nevada Cooperative Extension in Lander County, has kept detailed electronic records that were made available at the start of this case study. Additional data, including demographic, economic and commodity pricing data presented in the section "The Lander Sustainable Development Committee – A Regional Approach to Comprehensive Rural Community and Economic Development", was available through the U.S. Census Bureau, the

U.S. Bureau of Economic Analysis and the U.S. Federal Reserve Bank's Federal Reserve Economic Dataset (FRED).

Data Analysis

The "Think" stage of the action research methodology was used to structure and guide the analysis of both the quantitative and qualitative data that was collected during the "Look" stage. The purpose of the "Think" stage is to identify those key aspects of the information that help in the clarifying and understanding of the situations and local solutions being examined. According to Stringer (2007), "The task of the research facilitator in this phase of the research process is to interpret and render understandable the problematic experiences being considered…It uses experience-near concepts – terms people use to describe events in their day-to-day lives (rather than, e.g., theoretical concepts from the behavioral sciences) – to clarify and untangle meanings and to help the individuals illuminate and organize their experiences."

Plain spoken language is used throughout this case study. Because the U.S. Bureau of Land Management required completion of this "Project History", plain spoken language, with a purposeful avoidance of using language that would be familiar to a social scientist but less familiar to policymakers, economic development professionals and the general public, is used. The U.S. Bureau of Land Management will use this case study to develop a series of best practices that could potentially be used in other communities.

Results: The Lander County Sustainable Development Committee – A Regional Approach to Comprehensive Rural Community and Economic Development

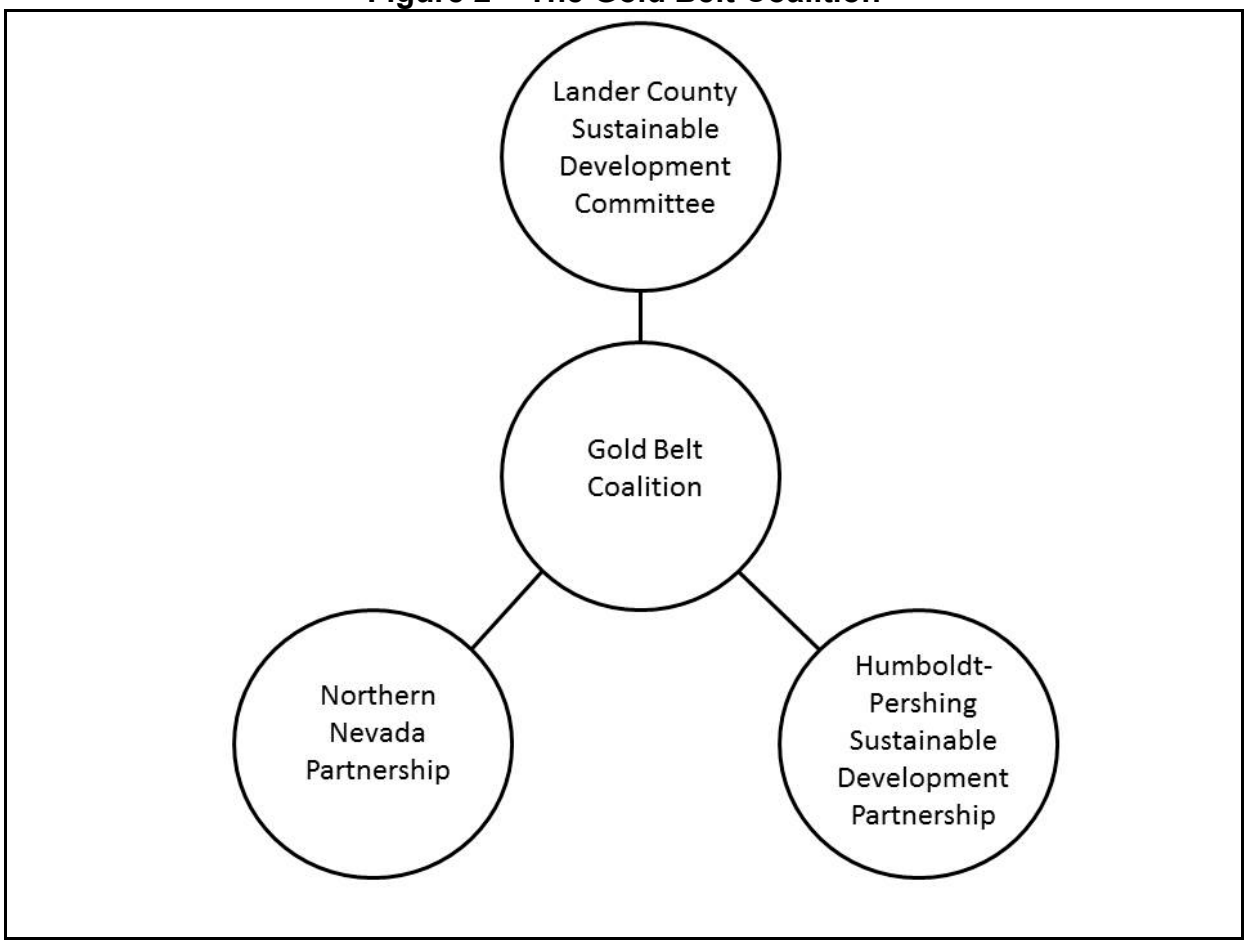
In 2003, the Northern Nevada Stewardship Group hosted a two-day workshop titled "Mining and the Community – A Partnership". Attendees included area mining companies, representatives from the U.S. Bureau of Land Management and the U.S. Forestry Service, faculty and staff from the University of Nevada, Reno and Great Basin College; Elko County; and various community leaders, organizers and representatives of different environmental and conservation groups. Two additional workshops, one held in Lander County in 2005 and one held for Pershing and Humboldt counties in 2007, led to the formation of the Gold Belt Coalition.

As illustrated in Figure 2, the Gold Belt Coalition consisted of the Northern Nevada Partnership (formed in 2003), the Lander County Sustainable Development Committee (formed in 2005) and the Humboldt-Pershing Sustainable Development Partnership (formed in 2007).

The Gold Belt Coalition, with a focus on sustainable development across the four member counties, was designed to support four primary efforts, including: (1) to develop collaborative associations for educational and informational exchange, (2) to coordinate local partnership to explore post-mine use of facilities, (3) to promote community capacity for engaging with public land agencies in resource management planning processes as they relate to community sustainability, and (4) to advance synergies for community sustainability through activities such as recycling, developing healthy rangeland ecosystems, supporting alternative energy projects and others.

According to the Lander County Sustainable Development Committee's website (2013), "Sustaining the long-term economic health of Lander County is the goal of the multi-faceted Lander County Sustainable Development Committee." In simple terms, the goal is to end the boom-and-bust cycle that is typical of Nevada's rural communities that have been tied to extraction of natural resources and those commodity prices since turning from territory to state. By reaching out to all walks of life in Lander County, the Sustainable Development Committee is helping shape a new future vision with the region's residents.

Figure 2 – The Gold Belt Coalition



In order to achieve its goal of diversifying the economy of Lander County using sustainable economic development approaches, the original founders of the LCSDC sought to create a cross-sectoral regional public service provider network involving public sector organizations and agencies at the local, federal and state level, as well as various nonprofit and for-profit private sector organizations.

The core of the LCSDC has been seven organizations, including (1) University of Nevada Cooperative Extension, (2) the Lander County Board of County Commissioners, (3) the Lander Economic Development Authority, (4) the U.S. Bureau of Land Management, (5) Goldcorp Inc., (6) Newmont Mining Corporation and (7) Barrick Gold Corporation. Developing trust and reciprocity, and a focus on shared goals and desired outcomes become central the organization and early development of the LCSDC. As illustrated in Figure 3, each of these seven individual organizations have, since 2005, developed a series of paths interconnecting them around the common mission of sustaining Lander County community's social, economic and environmental welfare.

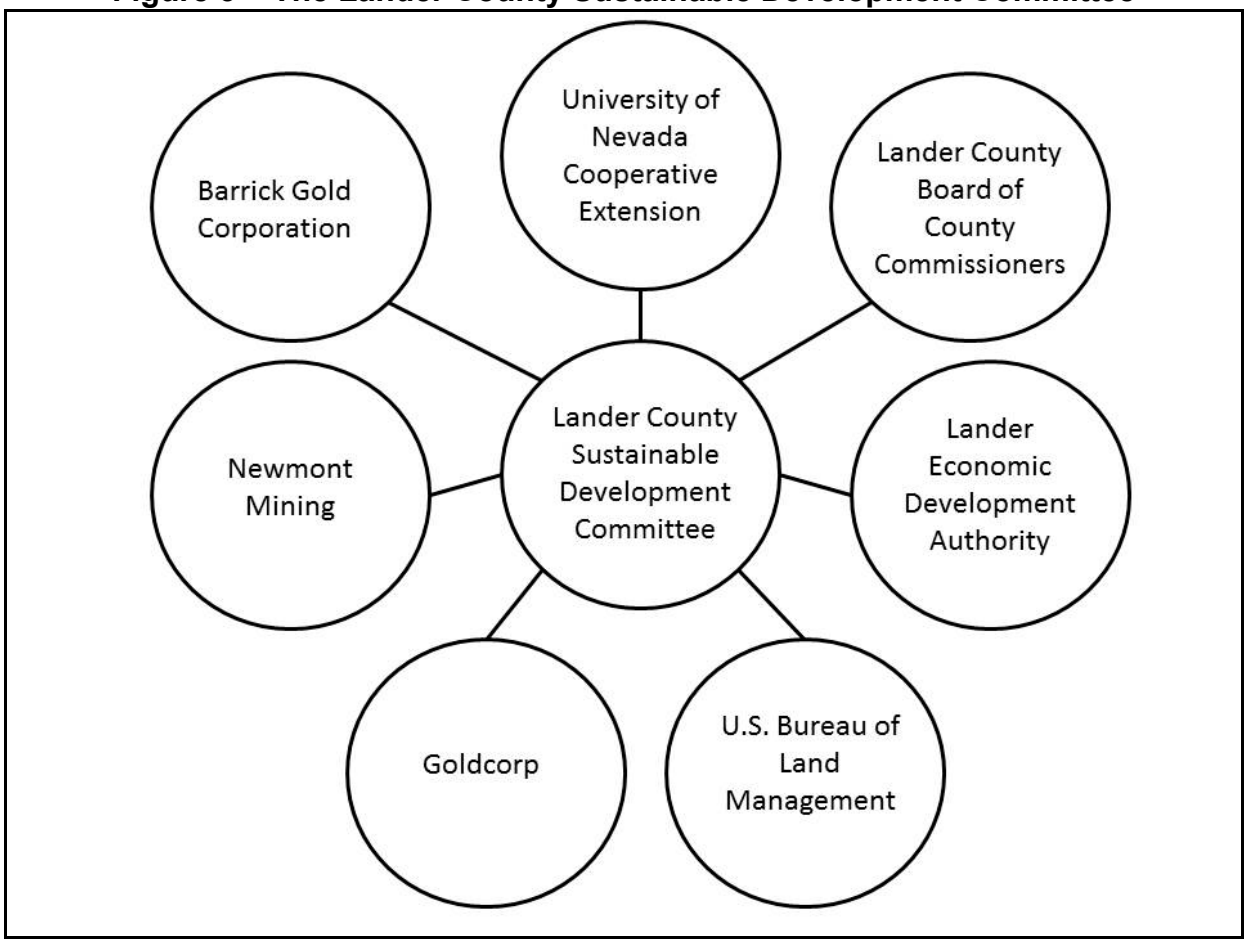
Much of this mission has been achieved through a shared focus on four primary goals, including: (1) maintaining communication within the Gold Belt Coalition of Humboldt, Pershing, Lander and Elko counties; (2) developing additional common goals for sustainable development within the Gold Belt Coalition; (3) maintaining healthy collaboration with public and private agencies and organizations sharing similar missions, goals and objectives; and (4) developing a regional marketing strategy for post mining site infrastructure.

To some degree, each of these four primary goals have been achieved with the completion

of four primary outputs (the FIND Project, the Renewable Energy Development Feasibility Study, the Battle Mountain Business Enhancements Program and the Lander Housing Gap Analysis) and two additional outputs (the 2009 Lander County Comprehensive Economic Development Strategy and the Community Business Enhancement and Marketing Plan) achieved primarily through the Lander Economic Development Authority.

Cross-sectoral regional public service provider networks such as the LCSDC have the ability to impact their external environment and are also impacted by their external environment. Two important factors impacting the LCSDC included and still include the boom-bust economic cycle characteristic of the mining and natural resource extraction industry and the overdependence on mining and natural resource extraction. Both of these conditions are addressed further.

Figure 3 – The Lander County Sustainable Development Committee



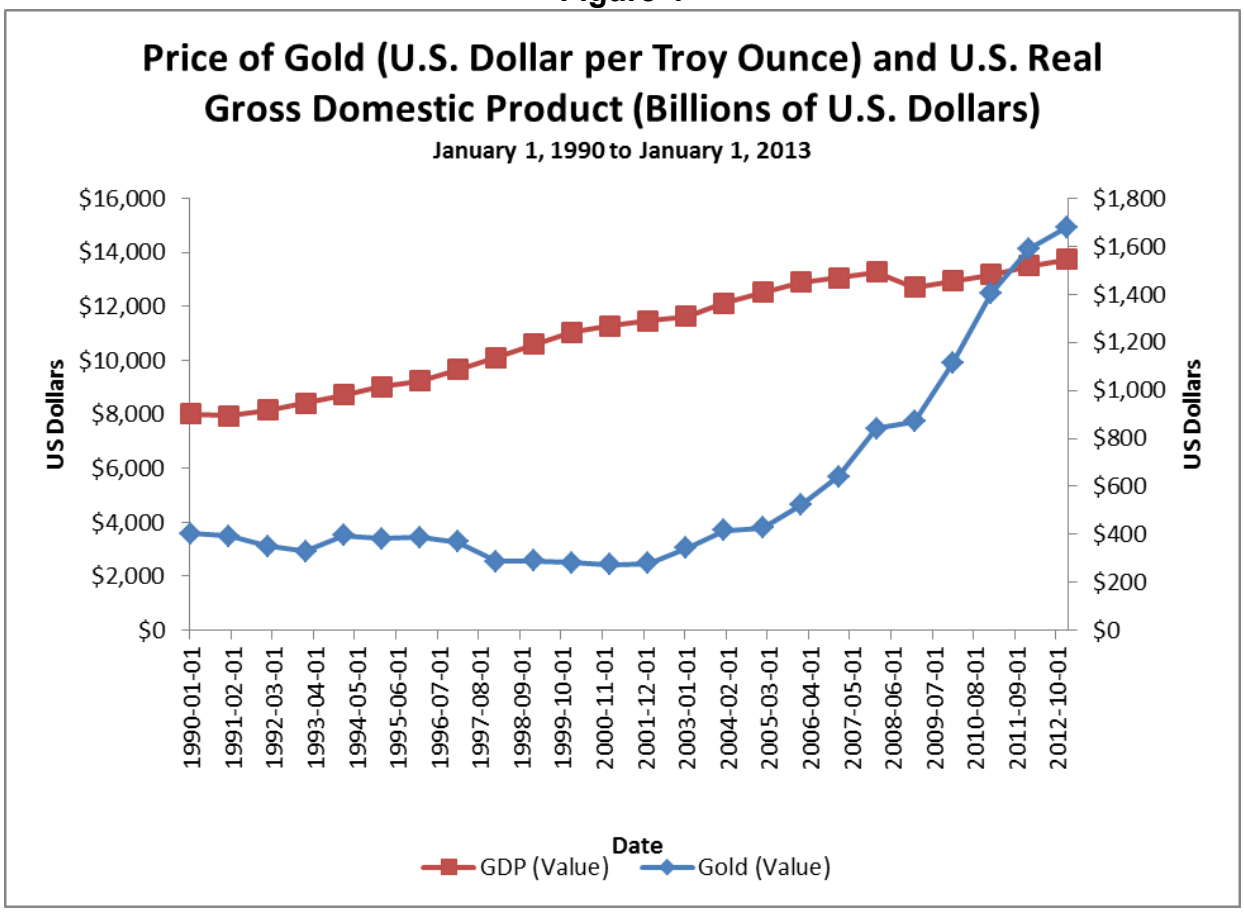
Situation

Figure 4 charts the change in actual U.S. Real Gross Domestic Product (GDP, measured in billions of U.S. dollars) and the closing price of gold (measured in U.S. dollars per troy ounce) on the first business day of each new year between 1990 and 2013. Between Jan. 2, 1990 and Jan. 2, 2013, the daily closing price of gold increased from a close of $401.7 per troy ounce in 1990 to a close of $1,681.5 per troy ounce in 2013, a net increase of $1,279.9 per troy ounce or 318.6 percent. U.S. Real GDP increased from approximately $8.0 trillion in 1990 to approximately $13.7 trillion in 2013, a net increase of approximately $5.7 trillion or 71.4 percent.

The boom-bust cycle that Lander County has had to contend with is best illustrated by examining year-to-year changes in the annual rate of growth in U.S. Real GDP versus the

closing price of gold. Typically, when U.S. Real GDP grows, the price of gold declines. Although the U.S. national economy may be expanding, the Lander County economy, which depends on high prices of gold and other precious metals and minerals to grow its local countywide economy, is contracting. As a result, Lander County becomes less attractive to possible relocating businesses when compared to other areas in the United States. As the price of gold increases as the value of U.S. Real GDP declines, businesses that might relocate to Lander County are reluctant to do so due to potential nationwide declines in overall economic activity. This inverse relationship is evident in Figure 5, which plots the annual average growth rate in both U.S. Real GDP and the closing price of gold (measured in U.S. dollars per troy ounce) on the first business day of each new year between 1990 and 2013.

Figure 4



Source: U.S. Federal Reserve Economic Datasets (FRED), Federal Reserve Bank of St. Louis, Economic Research Division, dataseries GOLDAMGBD228NLBM and GDPC1.

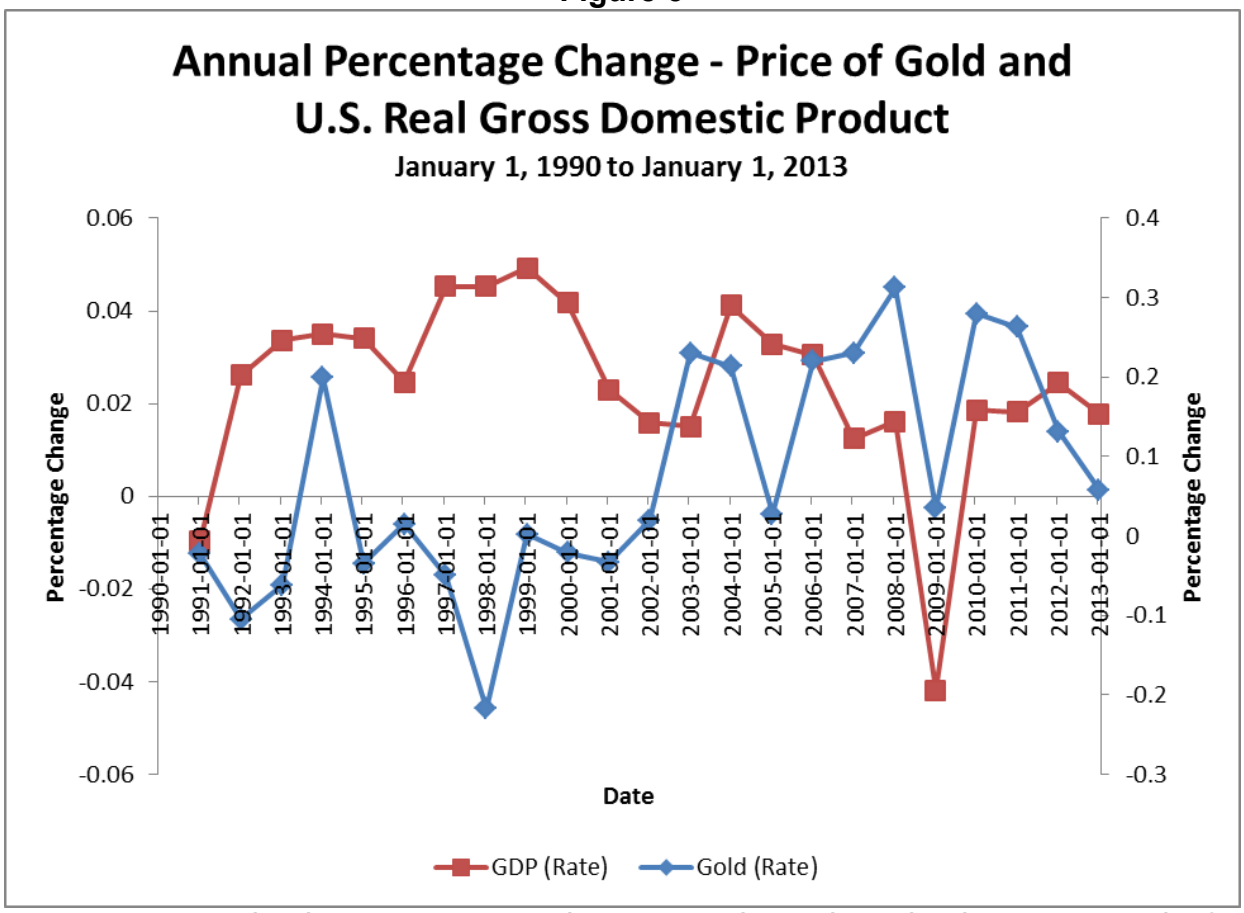
Between 1990 and 2013, the price of gold has fluctuated considerably more than the value of U.S. Real GDP. Between 1990 and 2013, the closing price of gold on the first business day of each new year grew at an average annual rate of 7.3 percent per year, with the greatest rate of decline of -21.8 percent between 1997 and 1998 and the greatest rate of growth of 31.2 percent between 2007 and 2008, for a total maximum-minimum range (an estimate of volatility) of 53.0 percent.

Comparatively, the value of U.S. Real GDP grew at an average annual rate of just 2.4 percent per year between 1990 and 2013, with the greatest rate of decline of just -4.2 percent between 2008 and 2009 and the greatest rate of growth of just 4.9 percent between 1998 and

1999, for a total maximum-minimum range of just 9.1 percent. Because of this high degree of volatility in the price of gold and other precious metals, versus the relatively low degree of volatility in the value of U.S. Real GDP, periods of either severe economic boom or severe economic bust in Lander County have been common. The much higher degree of volatility in the closing price of gold during the period of 1990 to 2013 illustrates the challenge Lander County has historically faced and the reason the LCSDC chose as its primary purpose to diversify Lander County's economy away from a primary dependency on mining and natural resource extraction.

In addressing the need to break the boom-bust economic cycle that has characterized Lander County and much of the central-northeastern part of Nevada, the LCSDC was formed in 2005 as part of the Northern Nevada Partnership that had originally been formed in 2003. The Gold Belt Coalition itself, which eventually consisted of the Northern Nevada Partnership (comprising Elko County and formed in 2003), the LCSDC (comprising Lander County and formed in 2005) and the Humboldt-Pershing Sustainable Development Partnership (comprising Humboldt and Pershing counties and formed in 2007), was formed as a direct result of the Northeastern Nevada Stewardship Group's efforts in 2003.

Figure 5



Source: U.S. Federal Reserve Economic Datasets (FRED), Federal Reserve Bank of St. Louis, Economic Research Division, dataseries GOLDAMGBD228NLBM and GDPC1.

Central to the LCSDC was and has been the goal of ending the boom-bust cycle that has been typical of Nevada's rural communities that have become primarily dependent on mining and natural resource extraction. Since its formation in 2005, the LCSDC has been responsible for several outputs, outcomes and impacts discussed in the following sections.

Key Inputs and Outputs

Since its initial development in 2005, the LCSDC has been responsible for four principal outputs, including: (1) the FIND Project, (2) the Renewable Energy Development Feasibility Study, (3) the Battle Mountain Business Enhancements Program and (4) the Lander Housing Gap Analysis. Two additional outputs have been achieved through the Lander Economic Development Authority, including: (5) the 2009 Lander County Comprehensive Economic Development Strategy and (6) the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan.

Central to each of these six outputs have been three primary inputs, including: (1) the initial development of the Gold Belt Coalition, (2) the use of collaborative efforts between key institutions and organizations including the Lander Economic Development Authority; Lander County; the University of Nevada, Reno (Cooperative Extension and the University Center for Economic Development); Barrick Gold Corporation; Newmont Mining; Goldcorp; and the U.S. Bureau of Land Management in the formation of the LCSDC and (3) an initial grant from the U.S. Bureau of Land Management in 2008 and 2009 that supported development and implementation of the FIND Project.

Input Number 1: Development of the Gold Belt Coalition and Project and Program Legacy

The Gold Belt Coalition was a partnership of three organizations including the Northern Nevada Partnership in Elko County, the Lander County Sustainable Development Committee and the Humboldt-Pershing Sustainable Development Partnership. Central to the founding of the Gold Belt Coalition was the development and efforts of the Northeastern Nevada Stewardship Group. The Northeastern Nevada Stewardship Group's initial mission was:

> "Whereas as the Northeastern Nevada Stewardship Group, we appreciate opportunities which allow us to live and work in Northeast Nevada, natural resources which enable local prosperity, productive ecosystems which provide healthy environments and quality lifestyles, and our western heritage, culture and customs.
>
> Therefore in order to ensure a better future for our families, community and future generations, to build trust among our diverse citizenry, and to ensure sustainable resource use, we join together as full partners to provide a collaborative forum for all willing participants. We are dedicated to dynamic, science-based resolution of important issues related to resource stewardship and informed management of our public lands with positive socioeconomic outcomes."

The development of the Gold Belt Coalition and its project and program legacy, including development of the LCSDC, can be divided into two distinct periods: (1) 1998 to 2007, organizational development of the Gold Belt Coalition and then the LCSDC, and (2) 2008 to 2014, projects and programs developed, implemented, and administered by the LCSDC. The following is a timeline of both periods.

1998: the Northeastern Nevada Stewardship Group is formed.

2002: the Northeastern Nevada Stewardship Group, comprised mostly of individuals and groups living and operating in Elko County, decides to begin a larger regional "discussion" on sustainable development in Northern Nevada.

November 2003: the first public workshop is conducted in Elko by the Northeastern Nevada Stewardship Group. This workshop leads to the creation of the Northern Nevada Partnership – Elko.

2004: formal formation of the Northern Nevada Partnership – Elko.

February 2005: the second public workshop is conducted in Battle Mountain by the Northeastern Nevada Stewardship Group. This workshop leads to the creation of the Northern Nevada Partnership – Lander County, which would eventually be referred to as the LCSDC.

2005: formal formation of the Lander County Sustainable Development Committee.

February 2006: the third public workshop is conducted in Winnemucca by the Northeastern Nevada Stewardship Group. This workshop leads to the creation of the Humboldt-Pershing Sustainable Development Partnership.

2007: formal formation of the Humboldt-Pershing Sustainable Development Partnership.

2003 – 2007: Formal development of the Gold Belt Coalition.

2008: formal launch of the FIND Project by the LCSDC independent of the Gold Belt Coalition.

2008: completion of the Housing Gap Analysis for Lander County.

2009: development of a Lander County Comprehensive Economic Development Strategy (CEDS) by the Lander Economic Development Authority with input and direction from the LCSDC.

2010: completion of the Battle Mountain Business Enhancement Program.

2012: completion of the Renewable Energy Development Study.

2012: completion of the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan.

2013: the Lander Economic Development Authority undertakes an update to the Lander County CEDS originally written in 2009.

2014: completion of the FIND Project with completion of Task 5, development of a FIND case history summary publication.

2008 – 2014: Completion of Four Major Projects by the LCSDC and Several Additional Projects and Programs by the Lander Economic Development Authority.

Input Number 2: Organizational Development of the Lander County Sustainable Development Committee

The February 2005 workshop conducted by the Northeastern Nevada Stewardship Group and held in Battle Mountain was a critical first step in the development of the LCSDC. The February 2005 workshop provided the initial key stakeholders and champions of the LCSDC an opportunity to meet collaboratively and discuss the agreed upon need to diversify the Lander County economy. It also provided the initial key stakeholders and champions an opportunity to discuss potential organizational approaches within which the county's wider diversification efforts would be pursued.

Through an expanded visioning process that began during the February 2005 workshop, the initial key stakeholders and champions of the LCSDC proceeded to develop a regional network consisting of several public sector organizations, including University of Nevada Cooperative Extension, the Lander County Board of County Commissioners, the Lander Economic Development Authority and the U.S. Bureau of Land Management; and several private sector organizations, including Goldcorp, Newmont Mining and Barrick Gold Corporation. The use of a regional network organizational structure for the LCSDC allowed the initial members of the LCSDC to overcome several important informational asymmetries. These informational asymmetries included:

1. A general lack of understanding regarding the infrastructure that had been developed for different mines during different periods of development located throughout the region.

2. A general lack of understanding regarding the potential opportunity and potential cost of wide-scale renewable energy development in the region.

3. A general lack of understanding regarding the opportunity cost associated with continued economic leakage of commercial-retail activity out of the region and into other neighboring communities.

4. A general lack of understanding regarding the exact need for new quality housing in Lander County.

Several early meetings of the initial key stakeholders and champions of the LCSDC between the February 2005 workshop in Battle Mountain and the actual formation of the LCSDC led to the development of a comprehensive mission and goals statement for the LCSDC. Discussed further in the next section, "Key Outcomes and Impacts, Outcome Number 1: An Increase in Regional Networked Development", the initial mission and goals statement included an initial mission, several future goals, and several future goal concepts. Each of the several future goal concepts contains specific organizational goals that have helped guide the development of the LCSDC and the organization's ability to overcome, deal with and solve each of the four primary informational asymmetries identified above. These seven future goal concepts, including the specific organizational guidelines, include:

1. Develop a mechanism to achieve coordination among the three community-based sustainable development groups within the Gold Belt Coalition.

    - Quarterly joint meetings between the three community groups (the Northern Nevada Partnership – Elko, the LCSDC and the Humboldt-Pershing Sustainable Development Partnership).

    - Utilize videoconferencing capabilities for meetings including the three different groups or establish quarterly videoconference meetings including the groups.

    - Establish a Gold Belt Coalition steering committee, consisting of officers from each of the three groups.

    - Jointly fund a regional coordinator for the Gold Belt Coalition.

2. Develop common goals for sustainable development within the Gold Belt Coalition.

    - Each of the three groups can organize a subcommittee to develop common goals.

    - Utilize the steering committee to develop common goals.

3. Continue the emphasis for development of a regional website in northern Nevada for sustainable development.

    - The U.S. Bureau of Land Management, Nevada State Office has funded Great Basin College, under a Cooperative Education Studies Unit Agreement Task Order to develop a sustainable development website.

    - All three community groups should stay involved in the website development to make sure it meets their needs.

4. Develop a formal organizational structure for the LCSDC.

    - The LCSDC needs to develop an organizational charter that clearly defines the committee structure, designates officers and their duties, defines the mission, etc.

5. Explore opportunities to strengthen membership and participation.

    - The committee needs to plan annual accomplishments (tasks) that achieve our goals.

- Make assignments to committee members and/or form subcommittees to complete these tasks.

- Agree to regularly scheduled meeting dates and schedule these meetings in advance.

- Promote and publicize our accomplishments toward achieving sustainable development.

6. Develop a regional web-based marketing strategy for post-mining site infrastructure.

   - Form a subcommittee of the LCSDC to review exiting asset databases available statewide.

   - If necessary, modify our Industrial Site Infrastructure Questionnaire to meet the needs of existing asset database websites.

7. Discuss and decide a process for the LCSDC for requesting and managing funds, such as grants.

   - Consider utilizing Northern Nevada Partnership – Elko group's status as a nonprofit organization.

Agranoff (2007) argues that a networked organizational approach is not a lack of structure. In fact, the networked organizational structure is a highly complex structure that can include multiple nested systems, including existing hierarchical organizations. A regional networked organizational approach to sustainable economic development requires the network members to carefully structure the network itself, its mission, its goals and its actual behavior. The future goal concepts developed by the initial key stakeholders of the LCSDC provided that structure and have successfully helped the LCSDC solve the initial informational asymmetries the LCSDC was designed to solve.

Although structure is critical, it is important that a certain degree of flexibility be built into the network in order to allow the network to adapt to changing external and internal circumstances. The future goal concepts developed by the LCSDC clearly outlined the relationship between the LCSDC and the Gold Belt Coalition. In a hierarchical model, it would have been significantly more difficult for the LCSDC to operate independently of the Gold Belt Coalition once the Gold Belt Coalition began to break apart. But, the flexibility that was built into the LCSDC has allowed the various LCSDC members to work independently of the other Gold Belt Coalition members on ongoing sustainable community and economic development efforts in Lander County. This mixture of explicit structure and remarkable flexibility in the organizational development of the LCSDC continues to contribute to the LCSDC's success in developing, implementing and administering various sustainable community and economic development policies, programs and projects in Lander County today.

Input Number 3: 2008-2009 Grant From the U.S. Bureau of Land Management

Financial support from the U.S. Bureau of Land Management in 2008 and 2009, totaling $229,749.66, was the third primary input that allowed the LCSDC to tackle each of the five initial tasks of the FIND Project. Table 1 breaks down budgeted expenditures for the $134,000 expended in 2008 and the $95,749.66 expended in 2009 and 2010 for FIND Project. In addition to these funds provided by the U.S. Bureau of Land Management, the Newmont Mining Company and Barrick Gold Corporation, both original LCSDC members and current members of the Lander Economic Development Authority, both contributed $30,000 each, for a total of $60,000, for use in completion of each of the five FIND Project tasks.

Table 1 – FIND Project Phase 1 and Phase 2 Budget 2008 Through 2010

Tasks and Subtasks	Budget Year (Fiscal Year)*		
	2008	2009	2010
	Obligation Years (Calendar Year)**		
	2008-2009	2009-2012	2010-2012
Task 1: Recognition of Development Potential			
1A: Transportation-Utilities Map	$107,500	$42,000	
1B: Add Industrial Areas to Map	$5,000		
1C: Existing Industries Inventory	$5,000		
1D: Workforce Demographics	$5,000		
1E: Site Liabilities and Zoning		$5,000	
1F: Database Storage, Maintenance and Application			$8,000
1G: Mine Site(s) Infrastructure Data Completion			$24,500
Task 2: Identification of Feasible Economic Development Opportunities			
2A: Review Development Documents	$500		
2B: Industrial Screening Assessment		$25,000	
2C: Leakage Assessment		$10,000	
2D: Develop Opportunity Ranking System		$10,000	
2E: Identify Most Promising Opportunities		$500	
Task 3: Incorporation of Community Vision Into Local Development			
3A: Review Community Demographics	$500		
3B: Review Existing Community Surveys	$500		
3C: Conduct Contemporary Survey	$10,000		
3D: Compile/Compare Survey Results		$5,000	
Task 4: Execution of a Marketing Effort to Attract Industry Partners			
4A: Identify Target Companies		$1,000	
4B: Identify Target Decision-makers		$15,000	
4C: Deliver Data to Decision-makers		$35,000	$10,000
4D: Develop Follow-up Strategy		$10,000	
4E: Plan Business Incentive Options		$1,000	
4F: Develop and Maintain Local LCSDC Website			$3,5000
Task 5: Development of a FIND Case History Summary Publication		$8,000	
2008 TOTAL	**$134,000**		
2009 TOTAL		**$167,500**	
2010 TOTAL			**$77,500**
TOTAL Obligations as of Dec. 7, 2011	**$134,000**	**$95,749.66**	

*Source: Scope of Work, FIND Project (2008); * Fiscal Year (FY) is Oct. 1 through Sept. 30 of each calendar year; ** Calendar Year (CY) is Jan. 1 through Dec. 31.*

Each of these three primary inputs has enabled the LCSDC to produce four primary outputs and, through the Lander Economic Development Authority, two additional outputs.

Output Number 1: FIND Project

The FIND Project, begun in 2008, has been the central output of the LCSDC and its efforts to achieve its stated goal of ending the boom-bust cycle of mining and natural resource extraction economic dependency. A collaborative effort among local, county, regional, state and federal government agencies, as well as various nongovernmental for-profit and nonprofit private sector organizations, the FIND Project has developed and implemented a methodology that has directly supported the completion of the following four tasks:

1. Recognition of the development potential within and throughout Lander County.

2. Identification of feasible economic development opportunities within and throughout Lander County as part of the LCSDC's long-term goal of diversifying the county's economy beyond principal economic dependence on mining and natural resource extraction.

3. Incorporation of a community vision developed by the LCSDC and its many partner organizations, members and individual public citizens into local and countywide development efforts.

4. Development, implementation and administration of a comprehensive business marketing effort designed to attract and recruit new industry partners to Lander County.

The fifth task, development of a FIND Project case history, is the publication of this paper through University of Nevada Cooperative Extension.

The initial scope of work for the FIND Project was drafted in 2008 and consisted of two interdependent phases, both of which have been supported by the LCSDC and facilitated through the Lander Economic Development Authority. Since 2008, the Lander Economic Development Authority has been responsible for approving and hiring any contractors for work on FIND Project tasks and has also been responsible for receiving, managing and dispersing any funds associated with executing the original scope of work drafted in 2008. A collaborative approach was initially built into the FIND Project with its original 2008 scope of work stating, "To execute the statement of work in a way that respects the collaborative vision but allows individual subtasks to proceed efficiently, project tasks and subtasks will be performed on a community-by-community basis, rather than attempting to complete the task for the entirety of northern Nevada simultaneously."

Task 1, recognition of development potential, was an initial step focused on evaluating economic development potential by determining what resources and industrial needs were located in the area. Eight separate resource categories (transportation, utilities, facilities, ancillary facilities, communications, ownership, permits and workshops) were initially identified. Five subtasks for compiling data related to each of these eight resource categories were developed and implemented:

1. Compilation of a Gold Belt Coalition target area map illustrating the mining districts for Twin Creeks; Mule Canyon; Midas; Marigold; Echo Bay; Trenton Canyon; Pinson; Turquoise Ridge; Getchell; and the Argenta, Greystone and Mountain Springs Barite Mines; which shows existing municipalities, transportation routes, power lines, gas pipelines, municipal water supplies, cellular towers and fiber-optic lines so that the location of utilities and transportation infrastructure is readily available.

2. Addition of active and interactive developed areas to the utilities and transportation map.

3. Compilation of detailed data on the facilities, ancillary facilities, resource ownership and permits for the active and inactive industrial facilities.

4. Compilation of data on workforce size and skills for the active facilities.

5. Compilation of site liabilities, title, zoning and other applicable development laws and codes.

Task 2, identification of feasible economic development opportunities, provided a useful understanding of what economic development opportunities in Lander County were feasible and not feasible within several general categories including agriculture, forestry and finishing, mining, construction, manufacturing, transportation, communication, electric, gas and sanitary services, wholesale trade, retail trade, finance, insurance and real estate, services, and public administration. Five subtasks for identifying feasible economic development opportunities were developed and implemented:

1. Review community development plans such as the Shoshone-Eureka Resource Management Plan, municipality master plans and design guidelines, municipality business plans, and county economic development strategies.

2. Completion of a screening-level assessment to determine which of the different industries tracked by the Department of Commerce are feasible in the northern Nevada area.

3. Assess impediments to development by reviewing the leakage assessments and documents such as the Central Nevada Region Target Industry Analysis.

4. Development of an Opportunity Ranking System to asses which of the feasible industries' development needs are best met by the existing local infrastructure and facilities (as identified in Task 1).

5. Identification of the most promising economic opportunities by using the Opportunity Ranking System to evaluate the compatibility of active and inactive developed areas with feasible industries.

Task 3, incorporation of community vision into local development, involved the development and execution of a community survey from which a community vision for economic growth and development was characterized, communicated and understood. Four subtasks for developing and incorporating a community vision into local economic development efforts in Lander County were developed and implemented:

1. Review community demographics utilizing the 2000 U.S. Census information.

2. Review the results of past community development surveys (Lander County; University of Nevada, Reno; etc.).

3. Conduct periodic contemporary community development surveys to supplement and update past surveys with current information and community views.

4. Compile and review past and contemporary survey results, and compare survey results to potential opportunities developed in Task 2, identification of feasible economic development opportunities.

Task 4, execution of a marketing effort to attract industry partners, is currently, as of June 2014, being implemented by the Lander Economic Development Authority and was initially designed to help focus the county's economic development marketing and attraction efforts. Five subtasks for developing and executing a focused marketing effort to attract industry partners were developed and implemented:

1. Identification of specific companies comprising the target industries.

2. Identification of specific decision-making positions within companies working on development projects.

3. Development of a means to deliver the opportunities data and community vision to decision-makers (website, baseline data report, fact sheets, etc.).

4. Development of a follow-up strategy for businesses that express an interest in development opportunities following the initial contact and opportunity data delivery.

5. Plan business incentive options in conjunction with the local governments.

Task 5, development of a FIND case history summary publication, required that upon final completion of all the tasks and subtasks associated with Phase 1 and Phase 2, the Lander Economic Development Authority through Lander County would issue a solicitation for the University of Nevada, Reno and University of Nevada Cooperative Extension to compile and publish a case history summary of the FIND Project. This task has been amended to include a case history of the LCSDC and subsequent outputs, outcomes and impacts. The publication of this document satisfies the requirements of Task 5.

Although the FIND Project is just now reaching the stage of its final completion, a 2010 submittal to the U.S. Bureau of Land Management as part of its 2010 Reclamation and Sustainable Mineral Development Awards Program (Sherve, 2010), identified seven specific areas of success created as a direct result of the FIND Project's efforts, including:

1. The baseline data gathering of the FIND Project has served as the impetus for removing economic growth barriers in Lander County:

- As the FIND Project was initiated, the Lander Economic Development Authority immediately realized that Lander County could benefit from the same baseline data collection on infrastructure beyond the mines' project boundaries. The regional scope of the FIND Project was coupled with a focused effort on the county. The Lander Economic Development Authority was awarded a grant from its parent agency, the Nevada Commission on Economic Development (NCED, renamed and repurposed as the Governor's Office of Economic Development in 2011), to catalog the county's infrastructure and industrial assets throughout the county using the same approach being undertaken in the FIND Project.

- Once the baseline data gathering was underway, it became clear that there were some long-standing inequities that existed in the county. The towns of Austin and Battle Mountain had designated floodplains that relied on outdated watershed analyses and outdated infrastructure information. With an updated analysis of Austin's floodplain designation, it is expected that FEMA will essentially eliminate the flood zone for the town of Austin. Previously, the entire commercial district was within the floodplain.

- Battle Mountain is currently completing a similar floodplain designation analysis, and preliminary data suggest that nearly the entire town of Battle Mountain (all of the commercial district) should be out of the flood zone designation.

- The baseline data gathering also provided an avenue for Lander County to incorporate state-of-the-art GIS technology for current and future use of its road inventories. By having comprehensive and accurate information on the road system, the county has been able to provide better information to the

state, thus receiving funding for road construction and maintenance.

2. The value of the partnerships with the LCSDC and the Lander Economic Development Authority is illustrated by the number of different contributors to the project:

   - The partnership was vital for the Lander Economic Development Authority receiving a $30,000 grant from NCED to fund the county's cataloging effort.

   - The partnership enabled the Lander Economic Development Authority to commit, along with Lander County, $35,000 for the FIND Project.

   - The partnership has allowed additional funding from the U.S. Bureau of Land Management, above the original grant award.

   - The partnership was vital for Newmont Mining Corporation and Barrick Gold of North America, Inc. to make contributions of $30,000 each.

3. A website has been established for the long-term use by the public to access relevant information through the FIND Project (http://findproject.org/index.html).

4. A high school leadership curriculum has been developed based on the results of the FIND Project.

5. Publicity of the FIND Project has been seen in local and statewide media and through highly visible national conferences.

6. Other rural counties are beginning to duplicate this process or are trying to partner with Lander County as the FIND Project continues the inventory efforts and baseline data-gathering efforts.

7. The U.S. Bureau of Land Management awarded a related grant that will be used to study the feasibility of renewable energy projects for post-mining land use administered in the same manner as the FIND Project.

The FIND Project remains the primary output of the LCSDC's and the Lander Economic Development Authority's efforts. The results of the FIND Project, including the data collected during development of the project and currently accessible through the completed project, has served as the primary starting point for the remaining five outputs listed in this section.

Output Number 2: Renewable Energy Development Feasibility Study

Funded by the U.S. Bureau of Land Management for $100,000 and published in February 2012 by Telesto Nevada, Inc., the Renewable Energy Development Feasibility Study was designed and developed to ascertain the feasibility of possible renewable energy facilities in Lander County. Specifically, according to Telesto (2012), "Lander County Economic Development Authority contracted with Telesto Nevada, Inc. (Telesto) to provide a report detailing the feasibility of renewable energy development in Lander County and a design outline to install renewable energy facilities on existing and/or reclaimed mine sites." Although completed in 2012 and originally contracted by the Lander Economic Development Authority, the LCSDC's earlier work with the FIND Project was critical in support of the work of Telesto in the development of this primary output. By itself, the Renewable Energy Development Feasibility Study continues to assist local, county, state and federal policies, as well as key leaders within the Lander County and regional business community, in the development of policies, programs and projects that support renewable energy development as a primary economic development strategy.

As part of this study, three broad categories of renewable energy development were examined, including: (1) geothermal power, (2) solar power and (3) wind power. According to Telesto (2012), "Of these, geothermal is the

most cost effective and reliable, but can only be developed on a mine site if a geothermal source is adjacent to the site. Solar energy can be easily adapted to a mine facility, but only produces energy during daylight hours. Wind energy has potential at mine sites because the turbines can be sited up to a few miles from the mine site to take advantage of localized wind speed variations, but wind farms produce power intermediately."

The focus of the Renewable Energy Development Feasibility Study, primarily on the potential for development of geothermal, solar and wind power was the direct result, or output, of the LCSDC's goal of diversifying Lander County's economy away from principal dependence on the mining and natural resource extraction industry using existing infrastructure already developed by the county's principal mining operations. Telesto (2012) concluded that, "Renewable energy development has potential in Lander County and provides opportunity for sustainable development on existing and reclaimed mine sites. In addition to the reclamation of mines into sustainable energy sites, these projects could provide high paying jobs for the citizens of Lander County." Using the framework initially developed by the LCSDC and the data and inventory produced by the FIND Project, the Lander Economic Development Authority and other local, county, regional, state and federal policies, in collaboration with various private sector and business leaders within the county and throughout the region, are now beginning to implement the recommendations of the Renewable Energy Development Feasibility Study through a variety of new policies, programs and projects, including the development of a comprehensive business recruitment plan.

Output Number 3: Battle Mountain Business Enhancements Program

Published in January 2011 as a University Center for Economic Development Technical Report (UCED 2010/11-03) by Harris, Davis, Landis, Torrealdy and Borden (2011), the Battle Mountain Retail Sector Analysis has formed the basis of the Battle Mountain Business Enhancement Program that the Lander Economic Development Authority and other local, county, regional, state and federal policymakers in Lander County are currently developing and implementing in partnership with various public-sector and private-sector agencies and organizations. The Battle Mountain Business Enhancement Program, and specifically the Battle Mountain Retail Sector Analysis, is another direct output of the LCSDC's early efforts and goal to pursue policies, programs and projects that would assist Lander County in diversifying its economy away from a principal dependence on the mining and natural resource extraction industry using existing infrastructure already developed by the county's principal mining operations. The Battle Mountain Retail Sector Analysis and the subsequent Battle Mountain Business Enhancement Program that is currently being developed and implemented in Lander County was, like the Renewable Energy Development Feasibility Study, built upon the primary results of and data collection in the FIND Project.

According to Harris, Davis, Landis, Torrealdy and Borden (2011), "During 2010, the University Center for Economic Development conducted an analysis of the retail sector in Lander County and Battle Mountain. An analysis of current retail sector trends and potential retail sectors was supported by the Lander County Economic Development Authority under the Future Industrial Needs Discovery (FIND) Project." The results of this study have been the development and implementation of a comprehensive Battle Mountain Business Enhancement Program designed to attract needed retail to the Battle Mountain area as a way of supporting future economic development and diversification away from a principal dependency on mining and natural resource extraction.

The Battle Mountain Retail Sector Analysis was divided into six individual sections: (1) an overview of county-level, state and national

retail sector trends, (2) an analysis of the needs and perspectives of the Battle Mountain business operators and owners, (3) an analysis of the needs and perspectives of Battle Mountain consumers, (4) a trade area analysis of downtown Battle Mountain, (5) an analysis of retail surpluses and leakages in downtown Battle Mountain, and (6) the development and suggesting of several different strategies for policymakers and economic developers in Battle Mountain and Lander County designed to capture retail sales in Battle Mountain.

Sales leakages, according to Harris et al. (2011), "…are normally viewed as an opportunity for unmet demand in the study area. This unmet study area demand could yield a potential to recapture lost retail dollars through creation of new local businesses." Sales leakage can also be defined as, according to Harris et al. (2011), "…the demand for goods and services that is not met locally…" It occurs because consumers within a local or regional area, such as the Battle Mountain study area identified in the Battle Mountain Retail Sector Analysis, either choose or are forced by a lack of local or regional options to make purchases at establishments located outside the immediate local or regional area. Based upon their analysis of the Battle Mountain study area, Harris et al. (2011) found that Battle Mountain residents had annual retail trade expenditures of approximately $42.2 million but that only $12.6 million in annual retail trade expenditures, or approximately 29.8 percent of total annual retail expenditures made by Battle Mountain residents, are captured by Battle Mountain retailers. This means that Battle Mountain residents spent approximately $29.7 million in annual retail trade expenditures, or approximately 70.2 percent of total annual retail expenditures, outside the Battle Mountain study area with retailers located in communities such as Elko, Winnemucca or Reno.

Seven specific retail sector development strategies were developed, including:

1. Analyze the local business sector to identify the needs and opportunities to be pursued by the program.

2. Provide management assistance and counseling to improve the efficiency and profitability of local businesses.

3. Assist new business start-ups and entrepreneurial activity by analyzing potential markets and local skills and matching entrepreneurs with technical and financial resources.

4. Provide assistance in identifying and obtaining financing as well as provide possible assistance in undertaking joint projects for Battle Mountain, including improving street appearance; improving management of the retail area; building renovations; preparing and implementing design standards, joint promotions and marketing; organizing independent merchants, special activities and events; fundraising; improving customer relations; and developing uniform hours of operation.

5. Develop a one-stop permit designed to assist new retailers and businesses with name registering; choosing of a legal form; and determining and obtaining the licenses, permits or bonds that might be needed. Other concerns include Internal Revenue Service (IRS) requirements, unemployment insurance, sales tax permits and workman's compensation insurance.

6. Involve active local organizations and the media to support small businesses and aid in developing awareness of the importance of local businesses.

7. Promote the development of home-based enterprises that can include a variety of full- or part-time occupations such as consulting, telecommuting, food processing, quilting, weaving, crafts, clothing assembly, mail-order processing or assembling of various goods.

The Battle Mountain Retail Sector Analysis also identified a five-step strategic planning process for further development of the retail sector in Battle Mountain, including:

1. Develop a Retail Sector Targeting Committee: This committee should include retail sector and decision makers, such as members of the Lander County Board of County Commissioners and other Lander County government employees.

2. Complete a Visioning and Goal-Setting Exercise: Battle Mountain may want to complete a more thorough visioning and goal-setting exercise that would better define the types of retailers most desired by Battle Mountain consumers.

3. Continued and Routine Data Gathering and Analysis of the Local Retail Sector: The primary objective of this step is to provide the basis for potential impacts in Battle Mountain from targeted retail sector development. This step would provide historic data over time and would assist in further focusing retail sector goals and targets for Battle Mountain.

4. Potential Project Identification: This step leads the targeting committee through a structured criteria-based process to assist in objectively choosing projects for retail sector targeting. Priorities, both short-term and long-term, for the Battle Mountain retail sector would be developed during this step.

5. Review and Update of Targets: Long-term in nature, this step would provide an annual review of targeting goals and regular revision of those targeting goals as changes occur in the Battle Mountain study area, retail sector, and other parts of the local and regional economy.

Harris, et al. (2011) identified three primary advantages associated with these steps:

1. Targeting permits clearer identification of specific retail industry requirements and needs.

2. Targeting enables the community to provide (for a given budget expenditure) fewer but more highly valued programs.

3. Targeting reduces the amount of financial incentives, such as tax rebates for labor training programs, needed to encourage the retail industry to locate in the region.

Discussed in further detail below in Output Number 6, the Battle Mountain Business Enhancement Program was developed using the results of the Battle Mountain Retail Sector Analysis. The LCSDC, in partnership with other organizations such as the Lander Economic Development Authority, is now turning the analysis and information from the Battle Mountain Retail Sector Analysis into different sustainable growth strategies and strategies that will encourage the recruitment of new businesses and the retention and expansion of existing businesses.

Output Number 4: Lander County Housing Gap Analysis

Published in July 2008 as a University Center for Economic Development Technical Report (UCED 2008/09-01) by Harris, Bonnenfant and Davis (2008), the Lander County Housing Gap Analysis examined population trends, labor trends, housing supply characteristics, housing demand characteristics and housing affordability characteristics in Lander County. A gap analysis, showing the separation between housing supply and housing demand in Lander County, was also produced.

As part of the gap analysis, four individual housing scenarios were constructed:

Scenario 1: Full Capture-Aggregate Housing

Scenario 2: Partial Employment Capture, No Employment Vacancy and Additional Uninhabited Units

Scenario 3: Full Capture – Disaggregated Housing

Scenario 4: Partial Employment Capture, No Employment Vacancy, Additional Uninhabited Units and Disaggregated Housing

Each one of these scenarios has provided critical quantitative guidance for policymakers in Battle Mountain, Lander County, and the State of Nevada, as well as in key federal agencies when it comes to pursuing policies, projects and programs designed to enhance the supply of quality affordable housing throughout Lander County as the county's population, workforce and economic profile continues to evolve and change as a result of regional, national and international fluctuations in the markets for precious metals and minerals that are currently mined in Lander County.

According to Harris, et al. (2008), "Without sufficient housing stock, rural counties in Nevada may find it difficult to compete for economic development. However, for many rural Nevada counties like Lander County, the variability of population and employment makes development of new housing stock difficult." This output, the Lander County Housing Gap Analysis, currently provides important policy direction from an economic development perspective by comprehensively evaluating housing needs in Lander County. The LCSDC, through its network-based organizational approach, has helped provide that guidance to the Lander Economic Development Authority and other executive, administrative and legislative bodies in Lander County.

Regarding the importance of quality affordable housing in Lander County, Harris, et al. (2008) conclude, "A housing gap analysis provides Lander County decision makers with information as to possible housing shortages for economic development. Also affordable housing may be an issue for Lander County in its economic development efforts. The lack of affordable and adequate housing impacts the ability of Lander County as to why they can recruit and the number of workers that may live in the county."

Through the Lander Economic Development Authority, two additional outcomes have also been achieved:

Output Number 5: 2009 Lander County Comprehensive Economic Development Strategy

Beginning in 2008 and completed in February 2009, Lander County, through the Lander Economic Development Authority, completed a Comprehensive Economic Development Strategy (CEDS) as defined by Title 13 of the Code of Federal Regulations, Section 303. Adopted by Resolution of the Lander County Board of County Commissioners on March 12, 2009, the Lander County CEDS contained several important development strategies for the county and the Lander Economic Development Authority as the county continues to shift from the comprehensive planning efforts undertaken by the LCSDC to their implementation.

According to Title 13 Section 303.7 of the Code of Federal Regulations (CFR), "CEDS are designed to bring together the public and private sectors in the creation of an economic roadmap to diversify and strengthen regional economies. The CEDS should analyze the regional economy and serve as a guide for establishing regional goals and objectives, developing and implementing a regional plan of action, and identifying investment priorities and funding sources." The regional focus of a CEDS, coupled with the overall goal of developing a road to diversify and strengthen the regional economy, both play into the overall focus and efforts of the LCSDC and, now, the Lander Economic Development Authority to diversify and strengthen the Lander County economy.

The development strategy outlined in the Lander County CEDS contained eight key steps, including:

- Lander County should work cooperatively with Nevada's Congressional delegation and the U.S. Bureau of Land Management to secure timely disposal of public land identified in U.S. Bureau of Land Management land-use plans as suitable for disposal.

- Lander County's economic development strategy must include forging relationships with executive and legislative branches of the State of Nevada and the U.S. government that results in political support for local investment.

- Lander County will encourage the creation of venture capital funds by area mining companies for investment in nonmining businesses in the area.

- Lander County must initiate efforts to seek a more equitable local distribution of the national benefits that result from transportation and utility infrastructure and federal land uses in the area.

- Concurrent with the initiation of significant targeted marketing or industrial prospecting activities, Lander County will focus upon enhancement of its communities as products to be marketed. This will include development of one or more industrial parks including rail-served industrial sites and industrial development adjacent to local airports. The County will develop and offer an incentive package for businesses relocating to the Battle Mountain area.

- Lander County will encourage organization and capitalization by residents and exiting businesses and industry of one or more community development corporations to enable proactive local investments that produce local employment and income benefits.

- Lander County will seek to establish a sustained commitment to funding and enhanced integration of local economic development initiatives.

- All entities within the county that regularly pursue economic development activities must come together in an organized fashion for the purpose of ensuring the effective use of limited public and private resources and to convey a consistent approach to development efforts within the county. The focused development effort that emerges from such organizing must initially strive to enhance its level of preparedness to conduct a professional economic development program. An important element of the development strategy is to ensure continuity is maintained for major community initiatives.

The implementation plan for this development strategy was divided into six elements, including: (1) organizational development, (2) intergovernmental relations, (3) access to public/private capital, (4) community infrastructure development, (5) targeted marketing, and (6) project development and management. Each of these six elements contained a series of action steps. A total of 14 individual action steps were developed for the 2009 Lander County CEDS, including:

1. Organizational Development:

    - Coordinate local economic and community development initiatives.

    - Obtain sustainable funding for economic and community development programs.

2. Intergovernmental Relations:

    - Document interjurisdictional dependencies.

    - Communicate dependencies and inequitable distributions of benefits to Nevada and federal political representatives.

    - Identify appropriate benefit sharing strategies.

- Redesign State Route 305/376 to be State Route 8A.

3. Access to Public and Private Capital:

   - Grantsmanship: Lander County will seek to leverage available General Fund monies with grants from state, federal and nongovernmental organizations.

   - Private Capitalization: the Lander Economic Development Authority will take the lead in working to establish and capitalize a community development corporation (CDC). The CDC would be charted and capitalized through a public offering focused at, but not limited to, individual and institutional and corporate investors located within the community.

4. Community Infrastructure Development:

   - Capital Improvement Programming: focused on positioning the county as a competitive location for business and industry expansion or relocation.

   - Project Implementation and Management: projects identified in the capital improvement planning process will be implemented according to the priority assigned to each. Where necessary, grant funds will be secured to enable planning, design and/or construction of priority projects.

5. Targeted Marketing:

   - Target Market Analysis: under the direction of the Lander Economic Development Authority, a target industry analysis will be obtained for Lander County. The analysis will seek to identify industry types that Lander County locations might compete favorably with other locales for expansion or relocation of firms.

   - Development and Implementation of a Marketing Plan: a strategy for marketing Lander County communities as locations for business and industry will be formulated, with particular attention on reaching targeted industries.

6. Project Development and Management:

   - Technical Assistance: a total of 37 individual technical assistance projects were identified for implementation within other parts of the 2009 Lander County CEDS.

   - Capital Improvements: a total of 22 individual capital improvement projects were identified for implementation within other parts of the 2009 Lander County CEDS.

The Lander Economic Development Authority was the primary agency responsible for the implementation of this action plan, the six individual elements and each of these 14 individual action steps. The 2009 Lander County CEDS signaled the first policy attempt of Lander County to move the primary responsibility of diversifying Lander County's economy away from its historical primary dependence on mining and natural resource extraction away from the LCSDC and to the Lander Economic Development Authority. Although the Lander Economic Development Authority is still a member organization within the LCSDC network, the Lander Economic Development Authority has emerged as an interdependent network of private and public organizations (many of which are still members of the LCSDC but also currently serve as members of the Lander Economic Development Authority Board) and has assumed many of the functional activities, including economic development policy, program and project development, implementation and administration, that were once the primary responsibility of the LCSDC.

Moving forward in implementation and administration of the 2009 Lander County CEDS, the Lander Economic Development Authority will continue to serve as the primary

responsible agency within Lander County. As of publication of this case study, the Lander Economic Development Authority was currently in the process of updating and revising the 2009 Lander County CEDS with the assistance of University of Nevada Cooperative Extension.

Output Number 6: 2012 Economic Diversification, Community Business Enhancement and Marketing Plan

The 2012 Economic Diversification, Community Business Enhancement and Marketing Plan provides the framework and focus that the Lander Economic Development Authority and Lander County are currently using to move forward with a variety of different outreach and marketing efforts, infrastructure capacity building, and community enhancements. The Economic Diversification, Community Business Enhancement and Marketing Plan grew directly from the LCSDC early efforts to diversify the Lander County economy and the Lander Economic Development Authority's current commitment to implementing the policies and projects the LCSDC initially developed through outputs such as the FIND Project. The Community Business Matching (CBM) model, developed by faculty at University of Nevada Cooperative Extension, the (former) Department of Resource Economics and the University Center for Economic Development, used baseline infrastructure, demographic, community opinion and business trend data to create a desirability index that identified the feasibility of recruiting businesses and industry to Lander County and their potential success rate based on existing and expected trends. According to the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan, "The results from the CBM model were used to identify potential development opportunities with the highest potential to be realized. It also identified 'opportunity gaps' in the local retail landscape which is being used to help build local businesses organically as well as attract new retailers and other vendor services."

The objectives of the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan, which were purposefully designed to mirror the goals identified in the 2009 Lander County CEDS and the 2004 Battle Mountain Business Plan, include:

- Ensure orderly planning of future development.
- Create growth patterns consistent with cost-effective delivery of public services.
- Utilize lands not currently in use.
- Encourage growth in a manner compatible with the surrounding area.
- Preserve existing agricultural use.
- Attract additional businesses that diversify the mining economy.
- Provide employment opportunities.
- Promote local businesses.
- Improve housing options.
- Improve educational opportunities.

The 2012 Economic Diversification, Community Business Enhancement and Marketing Plan focused on two primary areas of activity including: (1) promotion of existing businesses through customer attraction and downtown revitalization, and expansion of services per the outcome of community surveys and previous retail leakage studies, and (2) recruitment of new businesses and job centers, especially to diversify from the mining economy. Each of these two primary areas of activity were tied to the initial findings in the FIND Project. According to the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan, both of the two primary activities are designed to address, "…an initial sequence of activities that are either necessary for subsequent activities, or common activities identified in multiple

components of the FIND Project which fit within the current budget allowance." The Lander Economic Development Authority, as the primary responsible organization for implementation and administration of the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan, will continue to identify and pursue other activities in subsequent phases of the Economic Diversification, Community Business Enhancement and Marketing Plan.

Critical to current and future efforts of the Lander Economic Development Authority, as a successor agency to the LCSDC, is the industry sectors identified in the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan that the Lander Economic Development Authority, through a range of new economic development policies, programs and projects, will pursue. This industry sector list was divided into three categories, including:

1. Expansion of Existing Sectors: other financial investment activities; other telecommunications; individual and family services; general freight trucking; residential building construction; and electrical power generation, transmission and distribution.

2. New Sectors for Potential Business Recruitment, Local Demand: basic chemical manufacturing with local demand from mining, agriculture, fire-fighting and road construction/maintenance activities; scenic and sightseeing transportation; and other with local demand from tourists and visiting gamesmen.

3. New Sectors for Potential Business Recruitment, Export Dependent: petroleum and coals product manufacturing; textile and fabric finishing and fabric coating mills; animal slaughtering and processing; metal and mineral merchant wholesalers; and leather and hide tanning and finishing.

The 2012 Economic Diversification, Community Business Enhancement and Marketing Plan also contained a specific community plan for Battle Mountain. The Business Attraction and Downtown Revitalization part of the Economic Diversification, Community Business Enhancement and Marketing Plan is an extension of the 2005 Master Plan for Battle Mountain. Specific enhancement and attraction elements for Battle Mountain included decorative elements, lighting, landscaping, signage, awnings, entrances, rear facades, traffic and parking, design and streetscape treatment. In addition to specific enhancements of the physical built environment in Battle Mountain, the Business Attraction and Downtown Revitalization part of the Economic Diversification, Community Business Enhancement and Marketing Plan identified a series of community development initiatives and education enhancement policies, programs and projects that the Lander Economic Development Authority, Lander County and other partner organizations will be responsible for implementing long-term. The incorporation of both community development initiatives and education enhancement policies, programs and projects are vital to the Lander Economic Development Authority's effort to further diversify Lander County's and Battle Mountain's economy away from a historical dependency on mining and natural resource extraction by incorporating both property-based and nonproperty-based strategies into the Lander Economic Development Authority's overall efforts.

Finally, the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan developed four specific action steps, including: (1) relocation specialists, (2) branding, (3) advertising and (4) internal marketing. Each of these four action steps is tied to a series of specific actions that the Lander Economic Development Authority and other partner organizations will be responsible for implementing. Each action step is also tied to the overall goal of diversifying Lander County's economy.

For relocation specialists, the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan states, "There are companies that specialize in facilitating the transfer of information between communities and prospective business partners…the retention of relocation specialists could be an efficient means of focusing the advertising efforts, if specialists experienced with rural western communities were identified and managed." Four specific activities were identified as part of the relocation specialist action step, including:

- A scope of work for a relocation specialist will be developed that includes duties and input relating to portions of the other advertising tasks described below.
- Requests for qualifications (RFQ) and billing rates responding to the scope of work will be transmitted to three or more companies that offer relocation specialist services.
- The RFQ's will be reviewed, and a preferred supplier will be recommended for retention if an acceptable response is received.
- Pending the Lander Economic Development Authority's approval, the selected relocation specialist will be retained to execute the scope of work.

For branding, the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan states, "…branding requires continuity amongst community characteristics and marketing efforts so that the essence of a community is effectively reflected." Three specific activities were identified as part of the branding action step, including:

- Continuation of branding activities for Lander County and its economic sphere.
- Continuation of branding activities for individual communities such as Austin and Battle Mountain.
- Launch of additional branding efforts for communities or for specific industry sectors.

For advertising, the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan states, "Advertising would be focused on primary opportunities identified in the retail business sector analysis and CBM model, and would follow techniques tailored for attracting identified target industries." Three specific activities were identified as part of the advertising action step, including:

- Use of print and online advertisement.
- Sales piece development.
- Use of cold calls to businesses in target industries.

For internal marketing, the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan identified several key goals, including education of local residents and businesses with regard to the results of the FIND project and their meaning for economic development in Lander County, promotion of local businesses by encouraging residents to spend at local stores on local goods, encouragement in improving local customer service in order to retain local customers, and promotion of public-private partnerships for economic development in Lander County. Eight specific activities were identified as part of the internal marketing action step, including:

- The Lander Economic Development Authority and the LCSDC will host public events to present the results of the FIND Project.
- The Lander Economic Development Authority will work with the Chamber of Commerce to distribute FIND Project results to chamber members and to assist

interested local businesses in starting or expanding ventures upon request.

- Print advertisements for a "Buy Local" campaign will be developed and placed in the Battle Mountain Bugle.
- Radio advertisements for a "Buy Local" campaign will be developed and placed on local radio.
- Signs, posters and buttons promoting "Buy Local" campaign will be developed and distributed to interested local businesses.
- A "Buy Local" Web page will be added to local economic development websites.
- E-blasts of the advertisements will be sent to Chamber of Commerce distribution lists.
- The Lander Economic Development Authority and the LCSDC will coordinate with the Chamber of Commerce to form public-private working groups to work on business attraction and community development initiatives.

Table 2 – Milestones and Measurables
2012 Economic Diversification, Community Business Enhancement and Marketing Plan

Task	Responsibility	Timeline	Completed Yes/No
Branding			
Development/Publish of Logos	LEDA	7/01/2012	Yes
Publish of Logos in Print Media/Advertisements	LEDA	12/31/2012	Yes
Present Logos on Billboards/Signage	LEDA	12/31/2012	Yes
Advertising			
Develop Scope of Work for Relocation Specialist	LCSDC	7/01/2012	Yes
Solicit/Review Relocation Specialist RFQ Responses	LCSDC	9/01/2012	Yes
Select/Contract with a Relocation Specialist	LEDA	10/01/2012	No
Prepare Advertisements for the 14 Identified Sectors	LCSDC	12/31/2012	No
Identify Print/Online Advertising Placements	LEDA	2/01/2013	Yes
Place Advertisements	LEDA	2/01/2013	No
Cold-Call/Deliver Advertisements to Target Industries	LEDA	2/01/2013	No
Identify Follow-up Point of Contact	LEDA	12/31/2012	Yes
Internal Marketing			
Conduct Public Information Events	LCSDC	7/01/2012	Yes
Distribute Information Through Chamber of Commerce	LEDA	7/01/2012	No
Implement "Buy Local" Campaign	LEDA	12/31/2012	Partial
Form Public-Private Ad Hoc Partnerships	LEDA/LCSDC	Ongoing	Ongoing

Source: 2012 Economic Diversification, Community Business Enhancement and Marketing Plan; Lander Economic Development Authority; www.landeropportunity.org.

Table 2 reproduces the milestones and measurables table originally published in the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan with task, responsibility and timeline identified. A fourth column, "Completed Yes/No", is added as a way of determining whether or not the Lander Economic Development Authority and other responsible agencies and organizations actually accomplished the individual task identified in the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan.

As Table 2 illustrates, implementation of the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan is still a joint venture between the Lander Economic Development Authority and the LCSDC with the exception that the Lander

Economic Development Authority has become increasingly more responsible for implementation of the strategic economic development plans that were initially developed by the LCSDC. Based on input provided from key LCSDC and Lander Economic Development Authority members, eight subtasks in Table 2 have been completed, leaving five subtasks uncompleted and just one task partially completed.

Key Outcomes and Impacts

The efforts of the LCSDC over the past seven years since its formation in 2007 illustrate the importance of three primary outcomes. First, a regional networked development organizational approach was vital in aiding the efforts of the LCSDC to mobilize and generate the amount of resources needed by the LCSDC and its member organizations to begin the process of diversifying the Lander County economy. Second, it was important for the initial member agencies and organizations to develop a sense of collaboration, trust and reciprocity. By creating an environment of collaboration, trust and reciprocity among the various public sector (local, regional, state and federal) agencies, for-profit private-sector organizations, and nonprofit private-sector organizations, resource sharing among the various LCSDC members has helped the Lander Economic Development Authority and Lander County implement the strategies initially developed in the outputs produced by the LCSDC and identified in the previous section. Third, the LCSDC committed to the use of data-driven economic development policy, program and project development early on its efforts.

Outcome Number 1: An Increase in the Use of Regional Networked Development

Historical approaches to community and economic development typically involved a government agency, such as a redevelopment agency, planning department or economic development services department, developing, implementing and administering the strategic economic vision for a particular community. Through the budget process, the community would allocate resources to develop, implement and administer various policies, projects and programs designed to achieve specific outcomes. As the complexity of community and economic development has grown in recent decades, individual organizations and agencies have found themselves unable to overcome the information and resource asymmetries they now confront. The use of service-provider networks has become increasingly popular as public-sector, nonprofit private-sector, and for-profit private-sector organizations struggle to revitalize and transform their communities amid growing global and national economic pressures.

Agranoff (2007) defines networks as "…collaborative structures that bring together representatives from public agencies and NGO's (nongovernmental organizations) to address problems of common concern that accrue value to the manager/specialists, their participating organizations, and their networks." Agranoff (2007) further argues that networks, "…facilitate interaction, decision-making, cooperation and learning, since they provide the resources to support these activities, such as recognizable interaction patterns, common rules, and organizational forms and sometimes even a common language." The network provides a structure in which different public-sector, nonprofit private-sector, and for-profit private-sector individuals, agencies, organizations and entities can collaborate around common goals and objectives.

A review of various documents pertaining to the formation of the LCSDC and the FIND project indicates that the initial key stakeholders and champions of the LCSDC were quick to adopt a networked approach. An early draft of the LCSDC's mission and goals contains several points pertaining to the LCSDC's initial mission, future goals and future goal concepts that the initial key stakeholders and champions of the LCSDC agreed to jointly pursue through a networked approach.

- Initial Mission:

1. The committee was organized in 2005 to seek post-mining economic opportunities within Lander County.
2. Part of the committee's mission was to further the Northern Nevada Partnership's efforts to initiate and help foster a similar sustainable development effort within Humboldt and Pershing Counties.
3. To regionalize the concept of sustainable development along the I-80 corridor in northern Nevada, the Gold Belt Coalition.
4. Maintain a positive relationship between the local communities and the mining industry.
5. Be pro-active in the mine permitting process to address post-mining uses (sustainable economic opportunities).

- Future Goals:

1. Develop a mechanism to achieve coordination among the three community based sustainable development groups within the Gold Belt Coalition.
2. Develop common goals for sustainable development within the Gold Belt Coalition.
3. Continue the emphasis for development of a regional website in northern Nevada for sustainable development.
4. Develop a formal organizational structure for the LCSDC.
5. Explore opportunities to strengthen membership and participation.
6. Develop a regional web-based marketing strategy for post-mining site infrastructure.
7. Discuss and decide a process for the LCSDC for requesting and managing funds, including grants.

- Future Goal Concepts:

8. Develop a mechanism to achieve coordination among the three community based sustainable development groups within the Gold Belt Coalition.
9. Develop common goals for sustainable development within the Gold Belt Coalition.
10. Continue the emphasis for development of a regional website in northern Nevada for sustainable development.
11. Develop a formal organizational structure for the LCSDC.
12. Explore opportunities to strengthen membership and participation.
13. Develop a regional web-based marketing strategy for post-mining site infrastructure.
14. Discuss and decide a process for the LCSDC for requesting and managing funds, including grants.

Common across each part, the initial mission, future goals and future goal concepts for the LCSDC, is the recognition by the initial key stakeholders and champions of the LCSDC of the need to work regionally and collaboratively within some formalized structure that would encourage and facilitate engagement across various public-sector and private-sector organizations. An early draft of the scope of work for the FIND Project underscores the importance of a regional networked approach to sustainable development in Lander County. The initial preamble of the scope of works reads:

"The Lander County Future Industrial Needs Discovery (FIND) Project is a collaborative effort between governmental and non-governmental stakeholders with the vision: *We are working on ways to make our rural lifestyle less dependent on mining by finding development opportunities at existing and closed mine sites, and complementing ongoing economic development efforts in our communities*.

In collaboration with other stakeholders, the FIND Project objective is to develop and implement a methodology that would allow for: (1) recognition of development potential; (2) identification of feasible economic development opportunities, (3) incorporation of community vision into local development, and (4)

execution of a marketing effort to attract industry partners."

At both the organizational level (formation of the LCSDC) and the project level (development, implementation and administration of the FIND Project), a regionally networked approach to sustainable community and economic development was used by the initial key stakeholders and champions of the LCSDC and the FIND Project as a way of leveraging resources across organizational boundaries. This approach has enabled member organizations, agencies, individuals and entities to develop a shared mission and vision of sustainable development in Lander County and has positively contributed to the ability of the LCSDC to achieve key outputs, including completion of the FIND Project, the Renewable Energy Development Feasibility Study, the Battle Mountain Business Enhancement Program and the Lander Housing Gap Analysis. Additional outputs achieved primarily by the Lander Economic Development Authority, including the 2009 Lander County Comprehensive Economic Development Strategy and the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan, can also be directly traced to the regional networked approach to sustainable community and economic development developed and employed by the LCSDC.

Outcome Number 2: An Increase in Collaboration, Trust and Reciprocity

According to Agranoff (2007), "Leadership and guidance ability in networks as self-managing systems is another contributor to network cohesion. It is commonly understood that network leadership and management require the 'principles of soft guidance' as replacements for command and control." The LCSDC's approach to sustainable economic development in Lander County was, in 2005, and remains in 2013, a revolutionary departure from traditional approaches to community economic development. Historically, communities have sought a command-and-control framework within which the relevant political jurisdiction had supreme authority in the planning of strategic economic development efforts and the expenditure of resources to achieve stated goals. The early champions and organizers of the LCSDC rejected this command-and-control approach in favor of a network-based approach. A review of internal communications among various LCSDC partners between 2005 and the present, including a review of past LCSDC meeting agendas and minutes, suggests that this initial approach was not immediately embraced. Instead, key stakeholders and champions slowly introduced the concept of a network where participating LCSDC members would eventually pool their resources in the development, implementation and administration of the four initial major outputs identified in the previous section.

Early key stakeholders and champions within the LCSDC during its formation were quick to understand the importance of building an environment of collaboration and feelings of trust and reciprocity among the LCSDC partners. As Agranoff (2007) contends, "More than structure holds networks together. If they are not legal hierarchically based, they are 'structures of interdependence' in which dependence manifests itself in ways that contribute to cohesion based-mutual action." Common visions, missions and goals, along with the strategic actions that are developed, implemented and administered within the network are critical elements needed in order to develop that environment of collaboration and feelings of trust and reciprocity among network partners. The development of common visions, missions, goals and strategic actions were the first actions taken by the initial key stakeholders and champions of the LCSDC. A sense of 'shared fate' was created among the initial LCSDC members. The previous bust cycle in the prices of precious metals and minerals in Lander County was so severe and so universally felt across all sectors of the Lander County economy that each of the initial LCSDC members understood the need for a

radical new approach to community and economic development in Lander County.

But before each of the four initial primary outputs identified in the previous section were undertaken and produced, including the FIND Project, the Renewable Energy Development Feasibility Study, the Battle Mountain Enhancements Program and the Lander County Housing Gap Analysis, it was vital to the LCSDC long-term success that an environment of collaboration and feelings of trust and reciprocity were developed among the initial LCSDC members. This was not the environment during the LCSDC's original formation. Internal communications among various LCSDC partners during the first few years of the LCSDC, including past LCSDC meeting agendas and minutes, often contain accusatory language and indicate a sense of mistrust among various public-sector, nonprofit private-sector and for-profit private-sector partners. A review of more recent emails, minutes and agendas indicates a higher level of trust and reciprocity and a significant decline in the use of accusatory language among members. By routinely focusing on the need for Lander County to develop a series of strategic economic development initiatives, the early key stakeholders and champions of the LCSDC were able to develop an environment of collaboration and feelings of trust and reciprocity by focusing on common visions, missions, goals and strategic actions.

According to Agranoff (2007), trust within networks is developed in three major ways. First, most of the network's central players, political and technical core and staff, have known one another for a number of years. This was certainly true of the key stakeholders and initial champions of the LCSDC. Over time, the representatives from the participating public-sector organizations, including University of Nevada Cooperative Extension, the Lander County Board of County Commissioners, the Lander Economic Development Authority and the U.S. Bureau of Land Management, and the private sector, including Barrick Gold Corporation, Newmont Mining and Goldcorp, were able to build upon their existing personal relationships. Although a high level of mistrust might have existed among the organizations, the individual representatives from each organization had already spent a number of years developing personal relationships. These personal relationships at the organizational level led to the development of an environment of collaboration and feelings of trust and reciprocity at the organizational level that eventually led to the cohesion of the LCSDC and its ability to develop, implement and administer data-driven policies, programs and projects.

Second, most stakeholders and champions within the network have numerous experiences with counterparts from other agencies and organizations in dyadic (interaction between two people) or triadic (interaction among three people) collaborative ventures outside of the network itself. From these dyadic and triadic interactions, trust and reciprocity are developed, again, at the individual level and eventually transferred to the organizational level and then, ultimately, transferred to the network level. The initial members of the LCSDC, even prior to the formation of the LCSDC, had a long history of engaging in both dyadic and triadic collaborative ventures. Examples of previously existing dyadic relationships include previous collaborative efforts between University of Nevada Cooperative Extension and the U.S. Bureau of Land Management and between the U.S. Bureau of Land Management and Barrick Gold Corporation, between the U.S. Bureau of Land Management and Newmont Mining, and between the U.S. Bureau of Land Management and Goldcorp. An example of a previously existing triadic relationship that remains to this day is the relationship among University of Nevada Cooperative Extension, the Lander County Board of County Commissioners and the Lander Economic Development Authority. Although there were clearly some feelings of mistrust among the initial members of the LCSDC, the previous relationships among these organizations allowed the initial members of the LCSDC to develop the

environment of collaboration that eventually led to the primary outputs listed in the previous section.

Third, both the technical and program work that were accomplished within the network reinforce the trust process and build on the previous two forces, including the importance of existing interpersonal relationships among key stakeholders and champions and the importance of existing dyadic and triadic relationships among network members. As Agranoff (2007) points out, "As each agency pursues its designated work and results are produced, people representing different organizations develop the respect needed to foster additional trust." The LCSDC's cohesion and success is directly tied to the network members' ability to accomplish each of the four primary outputs described in the previous section, including the FIND Project, the Renewable Energy Development Feasibility Study, the Battle Mountain Enhancements Program and the Lander County Housing Gap Analysis. As each output was accomplished, each member of the LCSDC realized that the network could produce important outputs through collaboration.

Outcome Number 3: The Increased Use of "Tool" Development and Data-driven Policy, Program, and Project Development

Although collaboration, trust and reciprocity among network partners, and especially among members of the LCSDC, are important factors in the long-term viability of service-provider networks, Agranoff (2007) warns that, "Trust is not guaranteed by action." According to Agranoff (2007), trust among service-provider network members is gained through a, "…process of mutual learning through exploration…When participants hear technical presentations by colleagues or learn about others' programs, they develop more than a passing level of understanding. They learn not only about the other agency and its programs, but are able to make deeper judgments regarding the competency of the agency, along with the agency's potential contribution to the network's mission."

A review of internal communications among various LCSDC partners between 2005 and the present, including historical LCSDC meeting agendas and minutes, suggests that the type of technical presentations defined by Agranoff were early topics of LCSDC meetings. As trust began to grow among the LCSDC network members, individual organizational goals were set aside or, in some cases modified, in order for the LCSDC members to focus on LCSDC goals. Ultimately, the goal of sustaining the long-term economic health of Lander County by ending the boom-bust cycle associated with dependence on natural resource extraction through sustainable economic development practices became the underlying rationale behind the types of data-driven policies, programs and projects pursued by the LCSDC and its members.

Underlining the need for data-driven policies, programs and projects in Lander County was also a shared frustration among the original members of the LCSDC who observed that previous economic development efforts in Lander County had been guided by political forces or "best guesses" as to what was the best course of economic development action for the county. Again, a review of internal communications among various LCSDC partners between 2005 and the present, including historical LCSDC meeting agendas and minutes, clearly underscores this frustration, with several LCSDC members voicing their frustration that previous economic development efforts had been pursued to satisfy narrow interests or had been based on poor analysis and a poor general understanding of the political, economic, social and physical characteristics of the county and the region. A review of more recent internal communications indicates a significant decline in the level of frustration among LCSDC members as early programs and projects were accomplished.

As a result of the shared frustration with a lack of data-driven policy, program and project development in the past, the LCSDC and its members began to pursue early projects that would provide policymakers and project and program administrators with the information and analysis needed in order to make well-informed decisions. The four primary outputs listed in the previous section, the FIND Project, the Renewable Energy Development Feasibility Study, the Battle Mountain Business Enhancements Program and the Lander County Housing Gap Analysis, each have provided Lander County and LCSDC legacy organizations such as the Lander Economic Development Authority with important economic development tools. Each of these four primary outputs also provides data-driven policy, program and project development guidance to Lander County and, most specifically, the Lander Economic Development Authority as the LCSDC begins to wind down its own operation and the Lander Economic Development Authority begins to assume a more dominant role in the implementation and administration of the county's sustainable economic development efforts.

The Lander Economic Development Authority's current activities, evident in the completion of the 2009 Lander County Comprehensive Economic Development Strategy (and its update currently being completed at the time of this publication) and the completion and implementation of the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan, continues to be shaped and guided by the data-driven policies, programs and projects initially identified and developed by the LCSDC. Many of the tools the Lander Economic Development Authority is currently employing, including the online GIS-based interface of the FIND Project, were initially developed by the LCSDC and continue to help the county and the Lander Economic Development Authority achieve the goal of sustaining the long-term economic health of Lander County by ending the boom-bust cycle associated with dependence on natural resource extraction through sustainable economic development practices.

These early victories and adoption of data-driven policies, programs and projects continue to build trust among the current LCSDC members and the members of LCSDC legacy organizations such as the Lander Economic Development Authority. According to Agranoff (2007), "…trust can also be built through progressive results. Start with something small and build trust…start with low-risk efforts…As each network carves out the possible, results accrue that prove to the group that they can work together." Keep in mind that the LCSDC has only been active since 2005, and many of the tools and data-driven policies, programs and projects developed by the LCSDC and currently being employed by the Lander Economic Development Authority are still relatively new. However, the initial victories achieved by the LCSDC, in developing trust and a series of data-driven tools and strategic plans, including the FIND Project, the Renewable Energy Development Feasibility Study, the Battle Mountain Enhancements Program and the Lander County Housing Gap Analysis, continue to demonstrate and strengthen the ability of various public-sector, nonprofit private-sector, and for-profit private-sector agencies and organizations to come together in Lander County to achieve the goal of sustaining the long-term economic health of Lander County by ending the boom-bust cycle associated with dependence on natural resource extraction through sustainable economic development practices.

The long-term effects of each of these three impacts and the six outputs listed in the preceding section are still relatively unknown. The realization of long-term impacts, especially evidence of the LCSDC's efforts to diversify Lander County's economy away from its current primary economic dependence on mining and natural resource extraction, have not as of yet been realized and will likely not be for quite some time. In fact, the true impact of the LCSDC's efforts will likely not be tested until another significant bust in the boom-bust

cycle occurs. As Table 3 indicates, the Lander County economy is still primarily dependent on mining and natural resource extraction as a primary employment industry. Between 2007 and 2011, Agriculture, Forestry, Fishing and Hunting, and Mining was the single-largest employment category, employing 969 individuals, representing 38.3 percent of total employment, in Lander County. Retail Trade was the second-largest employment category, employing 266 individuals, representing 10.0 percent of total countywide employment. Construction was the third-largest employment category, employing 247 individuals, representing 9.8 percent of total countywide employment.

Table 3 – Employment by Major Category
Lander County, Nev.
2007-2011 Five-Year Annual Average

Employment Category	Total Employment	Percentage of Total
Agriculture, Forestry, Fishing and Hunting, Mining	959	38.3%
Construction	247	9.8%
Manufacturing	45	1.8%
Wholesale Trade	58	2.3%
Retail Trade	266	10.0%
Transportation, Warehousing, Utilities	183	7.2%
Information	16	0.6%
Finance and Insurance, Real Estate, Rental and Leasing	52	2.1%
Professional, Scientific, Management, Administration and Waste Management Services	113	4.5%
Educational Services, and Health Care and Social Assistance	241	9.5%
Arts, Entertainment, and Recreation; and Accommodation and Food Services	191	7.5%
Other Services, except Public Administration	25	1.0%
Public Administration	124	4.9%
TOTAL	**2,530**	**100.0%**

Source: United States Census Bureau, American Community Survey, 2007-2011.

Comparatively, Arts, Entertainment, and Recreation; and Accommodation and Food Services was the single-largest employment category statewide in Nevada between 2007 and 2011, employing 312,936 individuals, representing 25.1 percent of the state's annual employment. Educational Services, and Health Care and Social Assistant was the second-largest employment category statewide, employing 185,240 individuals between 2007 and 2011, representing 14.9 percent of total statewide employment. Retail Trade was the third-largest employment category statewide, employing 144,831 individuals, representing 11.6 percent of total statewide employment. Statewide, Agriculture, Forestry, Fishing and Hunting, and Mining employed just 18,980 individuals annually between 2007 and 2011, representing just 1.5 percent of the state's total annual employment base.

Future long-term impacts of the LCSDC's efforts could potentially be measured by comparing the estimates for total employment and percentage of total employment for each employment category listed in Table 3 with

future five-year employment data for the 2012 to 2017 period.

Further diversification of Lander County's population, in terms of educational attainment, will also be needed in order to more fully achieve the goal of diversifying Lander County's economy. As Table 4 indicates, Lander County still lags behind the State of Nevada in terms of its population 25 years or older with a high school diploma or higher or a bachelor's degree or higher. Between 2007 and 2011, the total number of individuals with a high school diploma or higher living in Lander County accounted for 77.6 percent of the county's population. Statewide, 84.2 percent of the state's total population had a high school diploma or higher, a difference of 6.6 percent in favor of the State of Nevada. Between 2007 and 2011, the total number of individuals with a Bachelor's degree or higher living in Lander County accounted for just 13.0 percent of the county's population. Statewide, 22.2 percent of the total population had a bachelor's degree or higher, a difference of 9.2 percent in favor of the State of Nevada.

Table 4 – Percent Educational Attainment, Population 25 Years or Older
Lander County, Nev.
2007-2011 Five-year Annual Average

Educational Attainment Level	Lander County	State of Nevada
Percent of Population High School Graduate or Higher	77.6%	84.2%
Percent of Population Bachelor's Degree or Higher	13.0%	22.2%

Source: United States Census Bureau, American Community Survey, 2007-2011.

In order to attract the types of jobs Lander County has identified as vital to its economic diversification efforts, further work in enhancing the educational attainment levels of the county's adult population will be needed. As the Lander Economic Development Authority continues to implement the strategic plans developed by the LCSDC, educational attainment improvement of the county's workforce should be a primary goal. Although overall diversification of the Lander County economy remains elusive, measured either by employment by major industry sector or by educational attainment, Table 5 indicates that there has been positive economic growth, measured in terms of the number of new housing permits and business licenses issued by the county in Lander County over the past few years.

Between 2009 and 2012, the total number of housing permits issued by Lander County increased by 14 total permits, or 233.3 percent, growing at an average annual rate of 94.4 percent and increasing from six total housing permits issued in 2009 to 20 total housing permits issued in 2012. Between 2010 and 2012, the total number of business licenses, renewals and new licenses, issued by Lander County increased by 41 total permits, or 4.1 percent, growing at an average annual rate of 4.1 percent per year and increasing from 489 total business licenses issued in 2010 to 530 total business licenses issued in 2012.

Although these impacts are significant, they are still short-term in nature. Longer-term impacts that can be linked directly to the efforts of the LCSDC and the FIND Project may not be realized for several years or decades. The LCSDC will also have to figure out how to exist among changing dynamics at the local, regional, state and national level. The Lander Economic Development Authority's role, as the primary organization now responsible for implementing and administering the economic development strategies first crafted by the LCSDC, first as a member of the Gold Belt Coalition and now as a relatively independent organization, will continue to grow.

Table 5 – Housing Permits and Business Licenses Issued by Lander County Countywide 2009-2012

Year	Total Housing Permits Issued	Percent Change	Total Business Licenses Issued	Percent Change
2009	6		N/A	
2010	6	0.0%	489	-
2011	24	300.0%	503	2.9%
2012	20	-16.7%	530	5.4%
2009-2012 Average	**14**	**94.4%**	**507**	**4.1%**
2009-2012 Actual Change	**14**		**41**	
2009-2012 Percent Change	**233.3%**		**8.4%**	

Source: Lander County Planning Department; Planning & Economic Development.

Organizing Community and Economic Development in the 21st Century and Embracing Complexity

Steinmann (2010), based on past work completed by the American Planning Association (APA) and the International Economic Development Council (IEDC), argues that the general goals of economic development include: (1) creating mid-to-high skill level jobs that (2) pay mid-to-high level wages and (3) offer individuals opportunity for general upward mobility while (4) improving a community's overall quality of life and (5) helping to stabilize locally collected tax revenues. Although there are significant differences in the way these goals are achieved, these goals are applicable to both the urban built environment and the rural built environment.

For communities transitioning from predominately rural to predominately urban, these goals can help focus different economic development policies, programs and projects. *How* these efforts are organized can be as important as the different types of policies, programs and projects chosen.

But before a new organizational approach can be considered, it is first important to understand the complexity in policy development, implementation and administration that policymakers and practitioners face. Don Kettl explores the complexities of public problems in the 21st century and the pathologies associated with the public sector in confronting complex problems. In exploring complex and "wicked" problems, Kettl (2006) argues, that "…what each of these problems share is a common feature: they slop over the boundaries, in both public policy and public organizations, that the nation has created to deal with them." The Gold Belt Coalition and then the LCSDC were both designed with this feature of complex problems in mind. The LCSDC in particular brings together a wide variety of competing interests – public and private; federal, state and local; etc. – in one organizational approach to sustainable economic development in Lander County.

The complex drivers between the boom-and-bust cycles that Lander County has traditionally been subject to had historically been addressed with little consideration of the interests of each competing interest. Past approaches in Lander County were reminiscent

of the five learning pathologies that Kettl (2006) outlines, including:

1. An instinct to look back instead of looking forward. Historically, Lander County and other counties in the central-northeast part of Nevada had just waited for the price of gold or other precious metals to recover and return to previous growth levels instead of developing efforts designed to break the boom-and-bust cycle for good.

2. An instinct to reform instead of to govern. Even at the state level, the focus on sustainable economic development in Lander County, a focus made possible by the LCSDC, has shifted the attention of policymakers and practitioners away from reforming current economic development practices to adopting entirely new approaches that are tied to the identified needs of businesses, residents and visitors in Lander County.

3. An instinct to think vertically instead of horizontally. Traditionally, many community and economic development efforts have been organized using a command-and-control, top-down hierarchical bureaucratic model, where orders are developed at the top and implementation is expected at the lower levels of the organization. Alternatively, a horizontal organizational structure encourages individual units within different organizations to communicate, collaborate and work across organizational boundaries. This horizontal approach increases the ability of organizations to adapt to changes in their external environment without communicating important information up and then back down the command-and-control, top-down vertical structure of a traditional bureaucratic hierarchy. At a very early stage, the organizers of both the Gold Belt Coalition and the LCSDC rejected the traditional vertical hierarchical bureaucratic model in favor of a horizontal organizational approach.

4. An instinct to regulate instead of to perform. The LCSDC has made economic performance, not regulation, its primary focus. Various sustainable economic development policies, programs and projects developed by the LCSDC, the Lander Economic Development Authority, Lander County and other organizations now focus on the ability to create mid-to-high skill level jobs that pay mid-to-high level wages while offering individuals meaningful opportunities for general upward mobility, improving the county's overall quality of life and stabilizing government collected revenues.

5. A misplaced veneration for outdated traditions instead of a focus on effective governance. Historically, mining has served as the primary economic base industry in Lander County and the other counties that once formed the Gold Belt Coalition. Mining represented not only a primary source of employment and revenue for Lander County but was, and still is, an important part of the county's overall community identity. Although mining is still very important to Lander County's economic base and its identity, the LCSDC has been able to engage the entire community in a discussion on the future of Lander County once mining is no longer the productive economic industry it currently is.

New organizational approaches, including the use of public networks, have been used to match the complexity of the challenges local communities face. Agranoff (2007) defines the public network as, "…collaborative structures that bring together representatives from public agencies and NGO's (nongovernmental organizations) to address problems of common concern that accrue value to the manager/specialists, their participating organizations, and their networks." Rural communities, such as Lander County, typically do not have the same degree of technical expertise and administrative capacity as their more urban, metropolitan counterparts. In the area of economic development especially, rural

communities are susceptible to the lack of administrative and technical capacity needed in order to develop, implement and administer a complex and comprehensive economic development strategy that might include a variety of real estate and land reuse strategies, technology and tech-transfer strategies, workforce and job development strategies, neighborhood and community development strategies, small business and entrepreneurial strategies, and economic development marketing and attraction strategies. Early on, the LCSDC was designed to leverage the resources of many public-sector, for-profit private-sector, and nonprofit private-sector organizations and agencies in order to overcome this administrative and technical capacity shortfall.

Cooperation and collaborative processes are two critical characteristics of a successful public network. According to Agranoff (2007), collaboration refers to, "…jointly working with others, usually to help resolve a problem. It can be occasional or regular, and within, between, or outside of formal organizations." As part of the early adoption of a public network by the LCSDC, the LCSDC's purpose, to sustain the long-term economic health of Lander County, was developed as a direct response to the problem of the boom-bust cycle presented by national and global fluctuations in the price of precious metals and minerals mined in Lander County.

The founders of the LCSDC, along with other community leaders, also realized the importance of collaboration during the formation of the LCSDC. According to Agranoff (2007), a collaborative process is, "…the process of facilitating and operating in multiorganizational arrangements to solve problems that cannot be solved, or solved easily, by single organizations." Breaking the boom-bust cycle that had characterized Lander County's economy is not a simple challenge, and the LCSDC, working with various public-sector, for-profit private-sector, and nonprofit private-sector organizations, is still at the very beginning of the implementation process.

However, the LCSDC has been successful in developing a comprehensive public network that has used collaborative processes to help shape a new future vision with the region's residents. Through organizations such as the Lander Economic Development Authority, several projects, including a Renewable Energy Development Feasibility Study (http://www.sustainablelander.org/pdf/LEDA_REDS_Report.pdf), a Battle Mountain Business Enhancement Program (http://www.sustainablelander.org/pdf/Battle_Mountain_Business_Analysis_Abstract.pdf; http://www.sustainablelander.org/pdf/Battle_Mountain_Retail_Sector_Analysis.pdf), a Lander County Housing Gap Analysis (http://www.sustainablelander.org/pdf/Lander_County_Housing_Gap_Analysis.pdf) and the Future Industrial Needs Discovery (FIND) Project (http://findproject.org/FIND_partners.html), have all been initiated. Each one of these four initiatives has helped shape a new vision of Lander County and will require the collaboration of multiple public-sector agencies (federal, state, regional and local) and several nonprofit and for-profit private-sector organizations, such as the Battle Mountain Chamber of Commerce, the Barrick Gold Corporation, etc., in order to move from development to implementation and administration.

Agranoff (2007) identifies four different types of public networks, ranging from, "…informational, developmental, outreach, and action networks," each corresponding to their primary purposes that range from mutual exchange to actually making policy and program adjustments. These four types include:

1. Informational: partners come together exclusively to exchange agency policies and programs, technologies and potential solutions. Taking any action is entirely up to the agencies on a voluntary basis.

2. Developmental: partner information and technical exchange are combined with education and member service that

increase member capacity in order to implement solutions within home agencies or organizations.

3. Outreach: partners come together to exchange information and technologies, sequence programming, pool client contacts, and enhance access opportunities that lead to new programming avenues. Implementation of designed programs takes place within an array of public and private agencies.

4. Action: partners come together to make interagency adjustments, formally adopt collaborative courses of action, and/or deliver services along with exchanges of information and technologies.

Although the LCSDC was formed in 2005 and has existed for under eight years, the LCSDC and the public network that it has been responsible for creating has evolved into an action public network with the purpose of making interagency adjustments, formally adopting collaborative courses of action, and delivering services along with exchanges of information and technologies. Individual agencies, organizations and individuals that currently participate in the public network that the LCSDC has helped create may not always agree on a single course of action. In fact, each agency, organization and individual still operates interdependently with other agencies, organizations and individuals in order to achieve its own unique goals and purposes. However, a significantly higher amount of collaboration exists today in Lander County as a result of the LCSDC's efforts and focus on sustaining the long-term economic health of Lander County with the goal of ending the boom-bust cycle typical to Nevada's rural communities that have been tied to the extraction of natural resources as a primary economic development strategy.

Collaboratively, the action public network that the LCSDC has helped create has already completed a significant number of projects, including the aforementioned Renewable Energy Development Feasibility Study, the Battle Mountain Business Enhancement Program, the Lander County Housing Gap Analysis and the Future Industrial Needs Discovery Project. The first three projects, including the Renewable Energy Feasibility Study, the Battle Mountain Business Enhancement Program and the Lander County Housing Gap Analysis, each focused on exchanging information and formally adopting a collaborative course of action in the areas of renewable energy development, business enhancement and affordable housing development.

The FIND Project has further helped share this information with organizations, such as potential employers, which are currently external to the action public network that the LCSDC has helped to develop. It should be noted that the regional nature of the FIND Project was initially required as part of the initial grant awarded to Lander County, the LCSDC and the Lander Economic Development Authority by the U.S. Bureau of Land Management. The initial scope of the FIND Project required a comprehensive assessment of existing industrial assets and potential future industrial uses along the U.S. Interstate 80 corridor between Pershing, Humboldt, Lander and Elko Counties, including a large geographic area in Eureka County. The close geographic proximity of residents and industrial assets associated with Barrick Gold Corporation's Cortez mine in Eureka County near the unincorporated town of Crescent Valley required the inclusion of industrial assets in neighboring Eureka County into the FIND Project and other subsequent projects completed by the LCSDC and the Lander Economic Development Authority.

This level of collaboration, and the formal adoption of collaborative courses of action, is evident in the current efforts of the LCSDC. Currently, the LCSDC has developed a second goal of enhancing the Battle Mountain area's business environment and community vision beyond the primary goal of matching existing mining infrastructure to business and

development needs via the FIND Project. Currently, the LCSDC and the Lander Economic Development Authority are working to turn the information gained during development of the FIND Project into shared knowledge and strategies that will allow Lander County to take advantage of emerging opportunities for sustainable growth and the recruitment, retention and expansion of new and existing businesses.

The multifaceted Battle Mountain Business Enhancement Program is part of this implementation strategy. Members of the LCSDC, which serves as the heart of this action public network, currently include University of Nevada Cooperative Extension, Barrick Gold Corporation, Newmont Mining, Goldcorp, the U.S. Bureau of Land Management, the Lander County Board of County Commissioners, the Lander County Economic Development Authority, Summit Engineering and Telesto Nevada. Each member, through the Business Enhancement Program, is currently working on developing a series of coordinated strategies designed to recruit, retain and expand new and existing businesses within Battle Mountain and across Lander County. In March 2009, the Lander County Board of County Commissioners formally adopted a Comprehensive Economic Development Strategy that was developed by the Lander Economic Development Authority with support from the LCSDC. The March 2009 Comprehensive Economic Development Strategy (CEDS), that the Lander Economic Development Authority as of June 2014 has updated, contained 14 individual implementation strategies divided into six elements, including:

1. Organizational Development: (1) coordinate local economic and community development initiatives, and (2) obtain sustainable funding for economic and community development programs.

2. Intergovernmental Relations: (3) document interjurisdictional dependencies, (4) communicate dependencies and inequitable distributions of benefits to Nevada and federal political representatives, (5) identify appropriate benefit sharing strategies, and (6) redesign of State Route 305/307 to State Route 8A.

3. Access to Public/Private Capital: (7) grantsmanship including the leveraging of available Lander County General Fund monies with grants from federal, state and various nongovernmental organizations, and (8) private capitalization where the Lander Economic Development Authority will take the lead in working to establish and capitalize a community development corporation (CDC).

4. Community Infrastructure Development: (9) capital improvement programming, and (10) project implementation and management.

5. Targeted Marketing: (11) target market analysis where, under the direction of the Lander Economic Development Authority, a target industry analysis will be obtained for Lander County, and (12) development and implementation of marketing plan.

6. Project Development and Management: (13) technical assistance where existing and new identified projects will be prioritized for development and implementation, and (14) capital improvements.

Each of these 14 strategies, across each of the six elements, will further help the action public network develop collaborative courses of action and help each of the action public network partners and members move from information exchange to actual service delivery. Implementation and administration of these strategies within the action public network that the LCSDC has helped create will depend on the ability of network partners to both cooperate and work within a collaborative process framework.

Although public networks, such as the LCSDC, are growing in popularity, not all networks are

successful in achieving the goals and objectives they were formed to achieve. Both Mazmanian (1999) and Callahan (2007) explore different networked approaches to service delivery as a way of determining what characteristics are most critical to a network's success.

Mazmanian (1999) explores the evolution of sustainable environmental policy in the United States through three policy epochs: (1) a command-and-control, top-down epoch where the federal government established environmental policy, including emission and clean air targets, and required state and local governments to comply; (2) a less rigid, more flexible command-and-control epoch where state and local governments were allowed to develop their own environmental policies, including their own emission and clean air targets based on local and regional conditions, within the context and framework of national environmental policies; and (3) a networked approach of local and regional stakeholders to the development, implementation and administration of different environmental policies.

It is the third epoch, which includes a networked approach of local and regional stakeholders to the development of a comprehensive set of policies, programs and projects, in which sustainable development became part of the American environmental policy lexicon. According to Mazmanian, "An alternative is to move Los Angeles in the direction of the broader environmental movement that is sweeping society today, toward greater sustainability and the third environmental epoch…It will require a significant transformation in what people value, where they live and how they work, and how the economy is organized. It would likely require appreciable changes in the region's governance." It is in this paradigm shift that the LCSDC has been most influential. The ability of the LCSDC to push the county and the various dispersed interests to look forward and not backward, to govern but not reform, to think horizontally and not vertically, to perform instead of regulate, and to focus on effective governance instead of focusing on misplaced veneration on outdated traditions, has made sustainable community and economic development a top priority in Lander County.

Another key aspect of the LCSDC has been its ability to bring together these various interests to develop, implement and administer a comprehensive set of policies, programs and projects designed to break the boom-and-bust cycle of natural resource extraction economic practices. The LCSDC has been the driver behind the consideration of different transportation policies, infrastructure policies, small business and entrepreneurial policies, and housing policies, among others, designed to place Lander County on a long-term sustainable economic development path.

Central to this organization of a regional collaborative network that includes many competing and various interests has been the inclusion of conflict into the structure of the LCSDC and its many efforts. Callahan (2007) examines three different transportation agencies in Los Angeles, each of which were responsible for different large-scale rail projects in Los Angeles County between 1978 and 2002. In examining these approaches, Callahan (2007) found that conflict between competing interests, even within a regional network, is inevitable. He further found that public agencies can succeed despite the problems of politics, that successful regional solutions are intensely local, and that cooperation emerges from supply-side mechanisms that create new resources rather than reallocate existing resources.

Each of Callahan's (2007) four primary findings are evident in the study of the LCSDC. First, conflict has not been absent from the efforts of the LCSDC, Lander County, the Lander Economic Development Authority or other groups in and around Lander County when it comes to the development, implementation and administration of comprehensive regional sustainable economic development policies, programs and projects. To the contrary, conflict

among the various competing interests – mining, business, agricultural, political, etc. – has been common. What is uncommon is the process for deliberation, in either interpersonal or public settings, provided by the LCSDC. Instead of tearing the partnership apart, the inclusion of conflict resolution into the LCSDC has allowed the various participating interests and stakeholders to develop, implement and administer different sustainable economic development policies, programs and projects together and toward a common shared future vision of Lander County.

Second, although long-term impacts of the LCSDC have yet to be determined, the current short-term and medium-term impacts of the LCSDC's efforts are evident. First, the LCSDC's collaborative nature has moved the focus on countywide economic development efforts away from a continued long-term dependence on natural resource extraction to a more sustainable path that is less subject to the boom-and-bust cycle. Second, LCSDC, through projects such as the FIND Project, have successfully inventoried community assets, and other organizations and entities, such as Lander County and the Lander Economic Development Authority, are now developing new policies, new programs and new projects designed to take advantage of these assets in a post-mining economic landscape.

Third, despite the initial interdependence of the LCSDC with the Gold Belt Coalition, a super-regional partnership formed by Pershing and Humboldt counties, Lander County, and Elko County, the LCSDC has successfully been able to focus its efforts locally while ensuring regional goals, such as breaking the boom-and-bust cycle of natural resource extraction in the Central-Northeast part of Nevada, are addressed in the short-term and medium-term. The LCSDC has helped champion several local initiatives such as the development of affordable housing and the development of a business plan for the town of Battle Mountain. Despite these local initiatives, each initiative is still placed in the context of its impact on moving the entire county away from its historical dependence on the boom-and-bust cycle of natural resource extraction.

Fourth, and finally, the LCSDC has assisted in the development of new resources as a way of meeting regional goals through local initiatives. Currently, the Lander Economic Development Authority and Lander County have approved the development of a Comprehensive Economic Development Strategy (CEDS), as defined in Title 13 Part 303 of the U.S. Code of Federal Regulations. The updated CEDS will allow Lander County, the Lander Economic Development Authority and the LCSDC to apply for a much wider variety of federally funded economic development grants. The LCSDC has also been central in the efforts to develop meaningful financial partnerships among Lander County, the Lander Economic Development Authority and various industry leaders in the county.

Rural Economic Development in the 21st Century – Typologies, Approaches and Issues in the Rural Environment

Although Steinmann (2010) argues that the general goals of economic development do not vary between the urban and rural environments, there are important differences in the political, social, economic, and cultural characteristics of the rural environment versus the urban environment. It is important to understand these differences and the differences among different rural environments as well. Koven and Lyons (2010) developed a typology of rural places. They argue that, "A one-size-fits-all approach to policymaking will not work because of great diversity in local environments." Policymakers and economic development professionals alike must take into account this diversity in the local environment when responding to changes in traditional economic patterns with economic development polices, programs and projects. The typology developed by Koven and Lyons (2010) includes four different types:

1. Amenity-rich Areas: amenity-rich areas typically are concerned with managing the pressures associated with growth, including providing affordable housing and creating livable-wage jobs. Although these areas do tend to have a growing Hispanic population, Koven and Lyons (2010) have found that these areas also tend to have populations that are older and are predominately white. "The population growth of amenity-rich areas creates a need for younger workers that has been filled in some communities by young Hispanics. Employment is relatively high and poverty is low in these communities. The natural environment is thought to be an important reason for their growth."

2. Declining-resource Areas: declining-resource areas were once dependent on some type of resource extraction operation, such as agriculture, timber, mining or some form of related manufacturing industry. These communities begin to experience economic decline due to the depletion of the natural resource(s) and the loss of the associated jobs. The natural resource(s) does not necessarily have to be depleted for an area to become a declining-resource area. The economic value of the natural resource(s) can fluctuate with periods of decline and growth due to global and national market forces, leaving a community subject to boom-and-bust cycles. According to Koven and Lyons (2010), "In these areas, property values and school enrollments have waned; out-migration particularly by young adults, is a major contributor to population decline…residents in these communities do not see sprawl or climate change as a problem, and they worry about population decline, jobs, and drug manufacturing/use by local residents."

3. Chronically Poor Regions: chronically poor regions tend to be characterized by devastating hardship, resource depletion, underinvestment (or no investment), inadequate education and generally weak civic institutions. According to Koven and Lyons (2010), "Residents did not move to the region for its natural beauty, and residents are concerned about crime, drugs, and unemployment." Policymakers and economic development professionals in chronically poor regions are concerned with mainly kick-starting the local or regional economy. Despite having generally weak civic institutions, the lack of general private-sector investment generally means that the public sector will have to take on a much more proactive and involved role in the local or regional economy. Chronically poor regions tend to develop over time and are generally the result of the failure of policymakers and economic development professionals in the past to properly assess and predict significant declines in the future.

4. Amenity/Decline Areas: amenity/decline areas share many similarities with both amenity-rich areas and declining-resource areas. Many of these areas are still experiencing growth, and the total number of resource-based jobs in the area might be declining but the jobs have not yet vanished. Koven and Lyons (2010) argue that, "An aging population reflects out-migration. These areas show signs and potential for amenity-based growth. In these areas, younger, working-aged adults are leaving to seek better job opportunities; however, 'amenity migrants' are arriving." An amenity/decline area is an area that might still be growing with a natural resource(s) base that might still be producing a sizable number of mid-to-high skill level jobs that pay mid-to-high level wages. However, the typical boom-and-bust cycle of the decline area may interrupt periods of growth and may foreshadow the area's potential economic hardship once the natural resource(s) and amenity(ies) have been depleted. Proper planning and investment in the present is needed to diversify the area's economy as a way of mitigating the negative impacts of a depleted resource(s) associated with a declining-resource area.

Understanding each of these typologies is helpful in understanding the rationale behind the development of the Lander County Sustainable Development Committee and the various economic development programs, projects and policies that the LCSDC has helped to develop, champion and implement through the Lander Economic Development Authority, the Future Industrial Needs Discovery Project, Lander County and other appropriate avenues. As mentioned in the introductory section, a primary rationale of the LCSDC's founding was the recognition that Lander County could easily become a declining-resource area once mining and natural resource extraction in Lander County becomes no longer viable.

An additional rationale of the LCSDC's founding was the desire of community leaders to break the boom-and-bust cycle associated with many declining-resource areas. In order to create mid-to-high skill level jobs that pay mid-to-high level wages, which would offer individuals opportunities for general upward mobility and improve the overall quality of life in Lander County while stabilizing local government revenues, the LCSDC was formed to pursue policies, programs and projects that would diversify Lander County's economy away from natural resource extraction. Using the infrastructure developed by the mining industry, the LCSDC, through the Lander Economic Development Authority and other groups, would identify opportunities to grow new industries as a way of avoiding the possibility of becoming a declining-resource area.

While many of the reasons for the LCSDC's forming are unique and tied specifically to the various political, economic, cultural and social characteristics and issues present in Lander County, the county itself has had to deal with many of the concerns many other rural communities nationwide have had to deal with over the past several decades. In 2008, according to Koven and Lyons (2010), just one-fourth of the total U.S. residential population lived in areas classified as rural by the U.S. Census Bureau, an area encompassing approximately 83.0 percent of the nation's total land mass. Evident in employment and population flows documented in past U.S. Censuses, Koven and Lyons (2010) conclude that population growth and economic prospects for residents in rural communities in the United States have lagged significantly behind those in other urban areas. Koven and Lyons (2010) articulate several of these trends, including:

- In 1950, approximately 44.0 percent of the nation's population lived in rural areas. In 2008, only approximately 25.0 percent of the nation's population lived in rural areas.

- Jobs in large metro areas grew 2.2 percent faster in the 1980s and grew 3.6 percent in the 1990s than jobs in nonmetro areas.

- In the 1990s, almost half of the nation's rural counties lost both population and employment. This is a trend that has continued for most of the 21st century as out-migration from rural, nonmetro areas to larger urban, metro areas has continued.

- The ratio of annual earnings for nonmetro to metro residents fell from approximately 82 percent in 1979 to 69 percent in 1999 meaning that the disparity in earnings between rural and urban residents has grown with urban residents earning significantly more than their rural counterparts.

- Not including the recession following the events of Sept. 11, 2001 or the recession of 2008 and the subsequent slow recovery nationwide, while urban poverty generally declined between 1997 and 2010, rural poverty did not. High poverty rates persist in many rural regions, including many parts of Nevada outside Washoe and Clark Counties.

- In many rural counties, the U.S. Census Bureau has estimated that some communities have lost so much population

that they are on the "brink of extinction." According to the U.S. Census Bureau, most out-migrants were of reproductive age. Of 1,346 total counties nationwide that lost population between 2000 and 2007, approximately 85.0 percent were located outside recognized metropolitan areas.

Although the impacts of rural decline have been obvious, a variety of explanations for this decline have been offered. Koven and Lyons (2010) offer four general explanations, each of which has some applicability to Lander County.

First, productivity in agriculture has reduced the numbers of workers needed. Between 1981 and 1997, Koven and Lyons (2010) estimate that total farm employment nationwide fell from 3.8 million estimated workers in 1981 to just below 3.1 million estimated workers in 1997. Furthermore, new farming and ranching methods and technologies dramatically reduced the total number of farms, with the number of farms falling from an estimated 6.0 million in 1950 to an estimated 2.0 million in 2004. Although farming, ranching and other agricultural-related industry sectors remain important sources of economic activity for rural communities such as Lander County and other rural communities across the United States, efficiency and productivity gains have led to significant declines in the demand for labor, a decline that is not likely to ever be reversed.

Second, as more and more metro-area jobs are concentrated in the fast-growing knowledge-based and technology-based industry sectors, Koven and Lyons (2010) find that rural communities, in comparison, "…specialize in lower skilled manufacturing sectors such as textiles, apparel, furniture, and natural resource-based products. Relatively low proportions of college graduates in rural areas contribute to the low concentration of technology-based industries." In addition to having a generally lower-skilled workforce, Koven and Lyons (2010) also found that, "…rural areas have suffered from a brain drain as more-educated residents have moved to metropolitan areas." In a community such as Lander County, this brain drain effect is felt even more keenly when the boom-bust cycle in precious metal and mineral prices busts or when a mine reaches the end of its productive life cycle. Those individuals with relatively high skills may only reside in the county on a temporary basis, and when the boom-bust cycle busts or when the mine reaches the end of its productive life cycle, the mid- or high-skilled level worker will leave the community in search of other employment opportunities elsewhere. Like many rural communities, this has, in the past, left Lander County with a workforce it is unable to use to innovate and kick-start new industries that might help diversify the county's overall economy.

Third, Koven and Lyons (2010) consider the impact deregulation has had on the divergence in economic fortunes between rural and urban communities in the United States. Koven and Lyons (2010) conclude that, "Deregulation that began in the Jimmy Carter administration reduced or eliminated subsidies to rural areas and led to higher prices or reduced services in banking, trucking, electricity, telecommunications, and air travel." For a community such as Lander County, especially given its geographic siting between major markets such as the Reno-Sparks-Washoe County region, Elko and Salt Lake City, it is difficult to have major businesses in key industries locate in Battle Mountain when they could just as easily locate in a larger market such as Reno, Sparks, Elko or Salt Lake City and still be able to capture some economic activity from Lander County. The lack of federal subsidies means that Lander County must compete directly with these larger markets.

Fourth, Koven and Lyons (2010) point out that, "…because of lower skill levels and lower wages, rural areas had been attracting more low-cost manufacturing producers. With the spread of globalization, more low-cost manufacturing plants have begun relocating to areas of the world where wages are even lower." Due to these globalizing pressures, domestic manufacturers have chosen to relocate to countries such as China and Mexico, where labor costs are artificially kept

low. Rural communities, such as Lander County, find themselves unable to diversify their local and regional economies with manufacturing because they cannot guarantee a supply of relatively low-cost labor.

Although various prescriptions have been proposed, Koven and Lyons (2010) conclude that, "…most analysts understand that reversing the downhill cycle facing small towns and rural areas will not be easy." They further conclude that, "Some rural communities tied to mining, farming, or low-wage manufacturing continue to hemorrhage jobs. Other small towns and rural communities have experienced rapid growth that poses a threat to their way of life." In either case, policymakers and economic development professionals in rural communities that are experiencing either significant declines or accelerated growth across the United States must find a way to strike an appropriate balance between the economic needs of their community in the present and the future and the desire to retain the valued characteristics of rural life. Despite the continued difficulties rural communities continue to face and the causes of them, Koven and Lyons (2010) present six policy and programmatic solutions, including:

1. Pursuit and development of good telecommunication technology.

2. Development of quality and reasonable access to affordable health care.

3. Development of effective educational facilities tied to a comprehensive workforce and job development strategy.

4. Development of accessible and efficient public transportation that fits current needs but can be expanded to meet future demand.

5. Development of quality and permanent affordable housing as a way of developing a more stable and permanent residential population.

6. Encouragement of the creation of jobs that offer living wages; or, as Steinmann (2010) argues, mid-to-high skill level jobs that pay mid-to-high level wages that offer individuals opportunity for general upward mobility and improve a community's overall quality of life while stabilizing local government tax revenues.

To be successful, Koven and Lyons (2010) suggest that each of these six strategies be implemented at a regional level and that regional collaborations among multiple jurisdictions, agencies and organizations be pursued whenever possible. Koven and Lyons (2010) conclude that, "…rural economic developers acknowledge that, no matter which of the above types a rural area is, development should be approached on a regional basis. Only regionalism creates the economic critical mass necessary to make a rural area a player in the global economy." The recognized need to compete globally was a primary driver behind the founding of the Northern Nevada Partnership in 2003 prior to the founding of the LCSDC in 2005. Early champions of the Gold Belt Coalition and then the LCSDC embraced a regional approach to economic development, focusing first on inventorying assets and then on developing regional economic development policies, projects and programs designed to diversify the regional economy of Humboldt, Pershing, Lander, and Elko counties. Although Humboldt and Pershing counties, Lander County and Elko County would eventually pursue their own economic development strategies separately, the legacy of the Gold Belt Coalition's regional approach remains in the development of new regional organizational approaches, such as the Great Basin Regional Development Authority that Lander, Eureka and White Pine Counties are currently pursuing as part of the State of Nevada's efforts to regionalize and reorganize economic development efforts across the state as part of Nevada Assembly Bill (AB) 449, passed by the Nevada State Legislature and signed into law by the Governor in 2011.

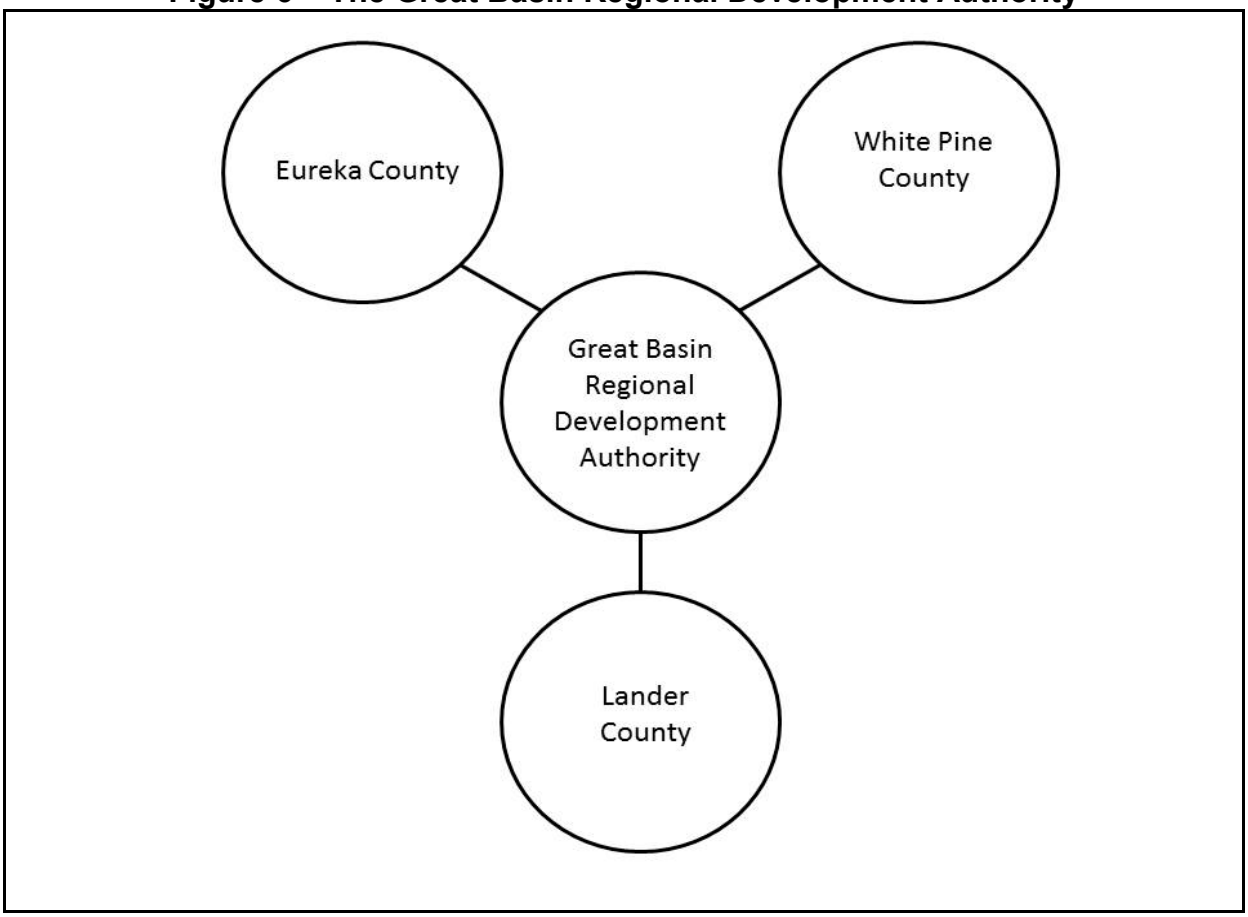
Rural economic development in the 21st century in the United States remains a challenge. Rural communities across the United States, including Lander County, must continue to contend with a growing disparity in the economic fortunes between rural and urban communities. Rural communities, such as Lander County, that have relied heavily on natural resource development and extraction as a primary economic development strategy run the risk of becoming declining-resource areas as the availability of the natural resources or the economic viability of their extraction declines.

This section has explored many principles pertaining to rural economic development as a way of framing the discussion regarding the past and current efforts of the Lander County Sustainable Development Committee. Many of those principles identified in this section have helped shape and direct the activities of the LCSDC since the formation of the Northern Nevada Partnership in 2003 and the LCSDC in 2005.

Conclusion

One important policy condition that both the LCSDC and the Lander Economic Development Authority must consider is Nevada Assembly Bill (AB) 449, passed and signed into law during the 2011 session of the Nevada State Legislature. AB 449 fundamentally changed and restructured economic development in Nevada.

Figure 6 – The Great Basin Regional Development Authority

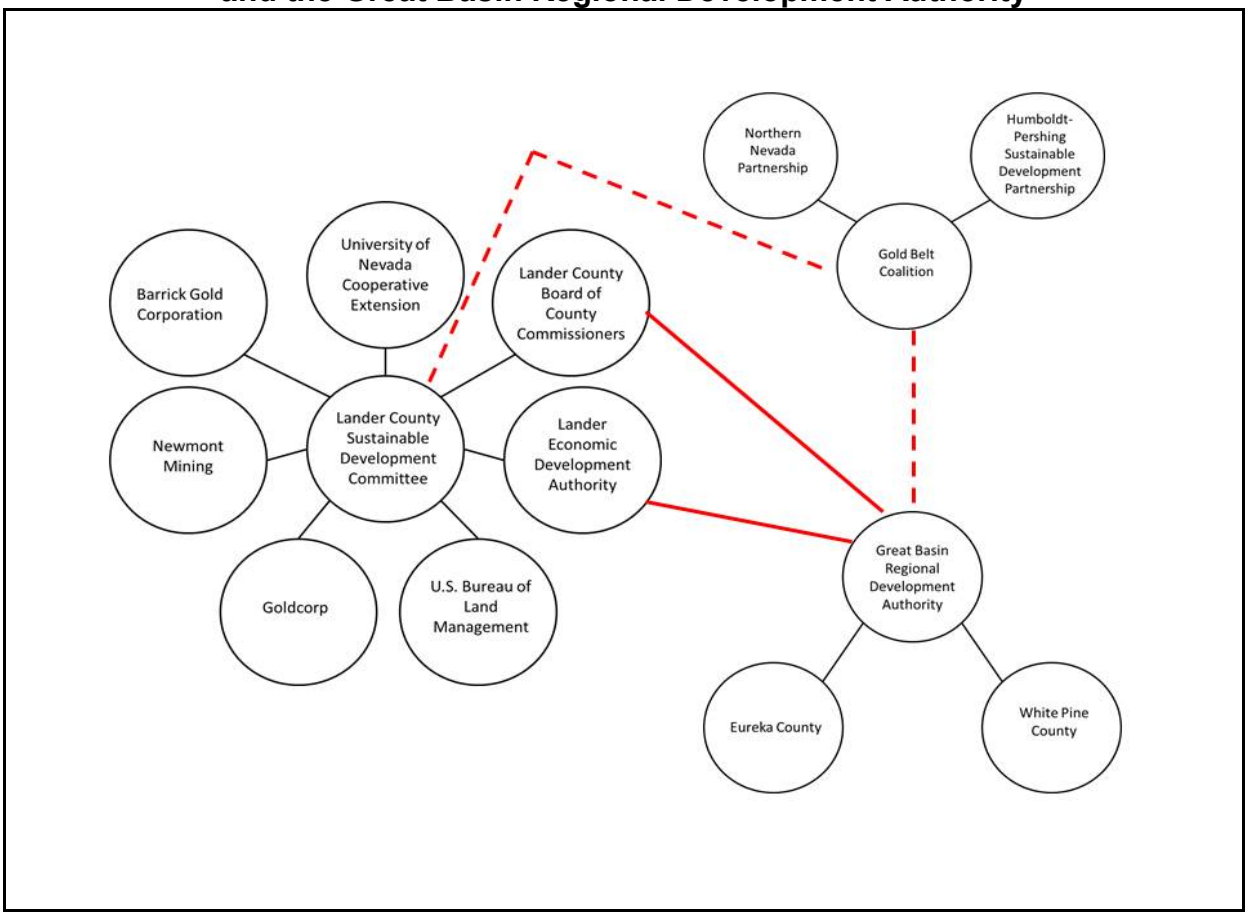


In addition to creating a statewide catalyst fund and knowledge fund, the Advisory Council on Economic Development, the Board on Economic Development, and the Governor's Office of Economic Development, AB 449 also required the development of several regional economic development authorities (RDA). For Lander County, the current RDA being

developed is called the Great Basin Regional Development Authority. Once completed and operational, the Great Basin Regional Development Authority will consist of Lander County, Eureka County and White Pine County as illustrated in Figure 6.

Although Eureka County was an early participant in the FIND Project, Lander County does not have a significant amount of experience partnering with White Pine County. All three counties, including Lander, Eureka and White Pine, are currently, as of the writing of this case study, working to develop the Great Basin Regional Development Authority's formation documents and a set of comprehensive strategies in which each of the three Great Basin Regional Development Authority member counties will strive to work collaboratively. This new regional economic development partnership has the potential of enabling the LCSDC and, more likely, the Lander Economic Development Authority and Lander County to leverage their own resources with the resources of Eureka and White Pine Counties to achieve significant regional economic development goals. However, the unfamiliarity and untested nature of this new regional economic development network configuration could also potentially derail and disrupt the already significant outcomes and impacts the LCSDC and the Lander Economic Development Authority have already had in Lander County.

Figure 7 – The Lander County Sustainable Development Committee, the Gold Belt Coalition and the Great Basin Regional Development Authority



The development of the Great Basin Regional Development Authority has significantly altered the landscape in which the LCSDC, the Lander Economic Development Authority and Lander County now operate. As Figure 7 illustrates, the LCSDC must now continue to adapt and evolve in this changing landscape as previous partnerships, such as the Gold Belt Coalition, become less important than new partnerships, such as the Great Basin Regional

Development Authority. Whatever the future organizational arrangement for sustainable economic development policies, programs and projects in Lander County and for the wider central-northeast part of the State of Nevada, it will be vital to ensure that the foundation laid by the LCSDC since 2005 is used properly to ensure the realization of positive long-term impacts for Lander County and its regional partners. The primary outcomes and outputs of the LCSDC will continue to support the activities of the Lander Economic Development Authority and Lander County in these new organizational arrangements.

Organizing economic development in the 21st century requires policymakers and economic development practitioners to focus on creating mid-to-high skill level jobs that pay mid-to-high level wages that offer individuals meaningful opportunities for general upward mobility, improve a community's overall quality of life, and stabilize government collected revenues. Twenty-first century organizational approaches to community and economic development must also take into account the complexities of economic development challenges communities face. In embracing this complexity, policymakers and practitioners must look forward not backward. They must govern instead of reform. They must act and organize their efforts horizontally, not just vertically. They must focus on performance and outcomes instead of falling back on their regulatory tendencies. And finally, they must focus on effective governance instead of venerating outdated traditions.

To accomplish these goals, policymakers and practitioners should consider the use of regional collaborative service-provider networks. The short-term and medium-term outcomes and impacts of the LCSDC suggest that this type of organizational approach can become an effective model for other communities that face similar problems and challenges. Most importantly, communities interested in using this regional collaborative approach must be sure to include as many different interests and stakeholders in the development of these regional collaborative networks. During its formation, it is important to build conflict into the networks' overall structure, because conflict is inevitable. It is also important to keep in mind that public agencies can succeed despite the problems of politics, successful regional solutions are intensely local, and cooperation emerges from supply-side mechanisms that create new resources rather than reallocate existing resources.

During implementation, several factors are critical to ensuring the long-term functionality of the network, including adaptation, a credible commitment to overall goals by all network participants, a commitment to resolving conflict through either interpersonal or public deliberation, credible enforcement of network resources, and effective monitoring of those resources.

The Lander County Sustainable Development Committee has been responsible for four primary outputs, including the successful completion of the FIND Project, a Renewable Energy Development Feasibility Study, the Battle Mountain Business Enhancement Program and a Lander County Housing Gap Analysis. Through the Lander Economic Development Authority, the LCSDC is also responsible for the successful completion of the 2009 Lander County Comprehensive Economic Development Strategy and the 2012 Economic Diversification, Community Business Enhancement and Marketing Plan.

Although most of the impacts associated with these outcomes are still short-term, a clear foundation for positive long-term impacts has been laid. Other communities attempting to develop similar collaborative regional public service provider networks for sustainable economic development purposes should remember that it is important to develop regional networks that allow individual agencies and organizations to leverage their resources with the resources of others to achieve regional goals. In doing so, collaboration, trust and reciprocity are

important building blocks that will help develop productive regional public service provider networks with the goal of implementing new policies, programs and projects designed to diversify the local economy. This collaboration, trust and reciprocity must also be generated across organizational lines among public-sector, nonprofit private-sector, and for-profit private-sector organizations and involve all relevant levels of government, including agencies at the local, regional, state and national level. Finally, the tools developed in achieving this goal must be data-driven. It is important for communities and network partners to engage in well informed and executed planning processes. Proper analysis of historical and current socio-economic and demographic conditions will help the network and its member organizations and agencies to develop those economic development policies, projects and programs, or tools, that are best able to help the community reach its long-term sustainable economic development goals.

Lander County has been engaged in a nearly two decades-old strategic sustainable economic development attempt. Since 1998, through various organizational structures and with various techniques, Lander County is now in the process of developing a series of very specific economic development policies, programs and projects that the county and other organizations will be responsible for implementing and administering. Beginning with the development of the Gold Belt Coalition, the Lander County Sustainable Development Committee has established a strong foundation on which the economic future of Lander County is now being built.

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Appendix 1 – Renewable Energy Development Feasibility Study

Appendix 2 – Battle Mountain Retail Sector Analysis

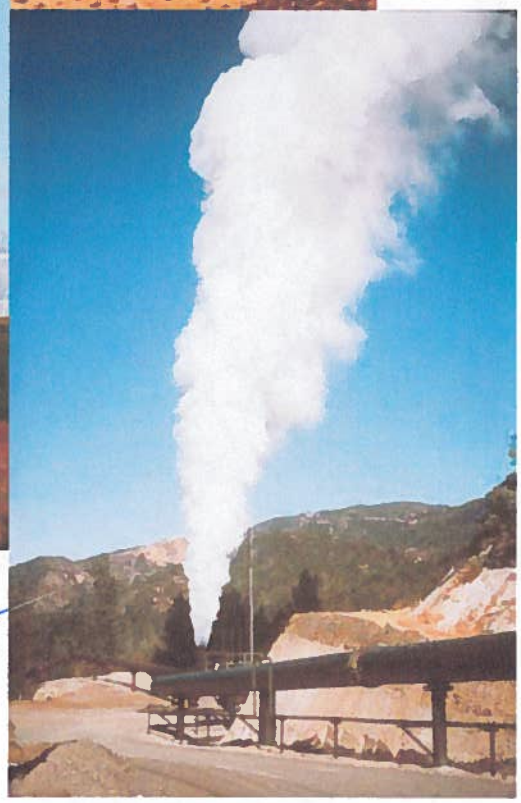
Appendix 3 – Lander County Housing Gap Analysis

February 7, 2012
LEDA REDS

Lander County Economic Development Authority

Renewable Energy Development Study

Feasibility Evaluation Report



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Sustainable development is defined as “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.”

“The cessation of mining should not be the end of the benefits to Lander County but should lead to a new beginning.” ----The REDS Team

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1.0 EXECUTIVE SUMMARY

Lander County Economic Development Authority (LEDA) contracted with Telesto Nevada, Inc. (Telesto) to provide a report detailing the feasibility of and a design outline to install renewable energy facilities on existing and/or reclaimed mine sites. Telesto has teamed with industry leaders in renewable energy in the western United States. Together, this report has been written to summarize the renewable energy potential on mine sites in Lander County, Nevada.

Three broad types of renewable energy were investigated: geothermal, solar and wind. Of these, geothermal is the most cost effective and reliable, but can only be developed on a mine site if a geothermal source is adjacent to the site. Solar energy can be easily adapted to a mine facility, but only produces energy during daylight hours. Wind energy has potential at mine sites because the turbines can be sited up to a few miles from the mine site to take advantage of localized wind speed variations, but wind farms produce power intermittently.

Renewable energy development has potential in Lander County and provides opportunity for sustainable development on existing and reclaimed mine sites. In addition to the reclamation of mines into sustainable energy sites, these projects could provide high paying jobs for the citizens of Lander County. For example, according to the National Renewable Energy Laboratory (NREL), 1,000 Megawatts (MW) of wind energy development could provide nearly 400 long term jobs, over 2,500 construction jobs and over $1 billion in total economic impact.

One of the main benefits of reclaiming mines for use as renewable energy sites is that mines generally have a large infrastructure system which could be reused during the construction and maintenance of the renewable energy project: transmission lines, substations and high grade roads being the most important of these. These existing features may make a mine site more economically feasible than undisturbed pieces of land and preservation of the infrastructure can enhance opportunities for more mineral production when commodity prices increase.

Capital costs for alternative energy for the three broad types are similar and significant – typically ranging from $2,000,000 to $4,000,000 per megawatt. Tax incentives may allow recovery of up to 30% of these investments. Operating costs vary with the size of the installation and range from about 1.0¢/kwh for geothermal energy to over 5.0¢/kwh for solar energy. Additional incentives such as loan guarantees and tax credits may help the economics for a particular installation. The feasibility of each site for renewable energy will be site-specific, principally due to the variability of the alternative energy source as it relates to utilization during mining and the future value of energy when sold into the grid.

Generically, the following conclusions were reached during the renewable energy feasibility study presented herein:

- Geothermal energy is the most feasible renewable energy type. Currently, known geothermal resources in Lander County do not coexist with active mines. The use of geothermal energy for mine sites in Lander County will be limited until technology allows exploitation of lower temperature sources or until higher temperature sources are identified.

- Solar energy is adaptable to operating mines and post-closure mine sites with the use of existing mine infrastructure. Solar energy is limited to daylight hours but can be augmented with storage technology to extend hours of production.

- Wind energy has moderate potential on mine sites in Lander County due to marginal wind speeds in the valleys where the mine facilities are typically located. Additionally, radar and military aviation height constraints may limit the use of megawatt-scale turbines (over 200 ft in height).

- Hybrid systems that allow the renewable energy to be stored to “firm” (level) energy production may be the best solution at individual mine sites, but additional capital will be needed to construct the hybrid component of the system.

- The decision to build a renewable energy project may involve other factors that are not purely based on present economics. A mine site may make a good location if the needed infrastructure is in place.

- Reclamation bonding of mines and public land policy should not force the removal of infrastructure that could be used for sustainable development of mine sites into other economic enterprises such as renewable energy projects or future mining.

- It may be necessary for regulatory agencies to review their regulations, policies and procedures in order for renewable energy projects to be implemented on mine sites.

It is important to perform a site-specific study to evaluate the Critical Success Factors for any such Renewable Energy project on an existing or abandoned mine site.

Once these Critical Success Factors are determined and evaluated, a feasibility study for the specific site can be ascertained.

ABBREVIATIONS AND ACRONYMS USED IN THE REPORT

The following acronyms and abbreviations are used throughout this report:

ARD	Acid Rock Drainage
AWEA	American Wind Energy Association
BLM	U.S. Bureau of Land Management
BWEA	British Wind Energy Association
CSP	Concentrated Solar Power
CUP	Commercial Use Plan
DOE	U.S. Department of Energy
DSIRE	Database of State Incentives for Renewables and Efficiency
EA	Environmental Assessment
ED&C	Engineering, Design and Construction
EIS	Environmental Impact Study
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FLPMA	Federal Land Policy Management Act of 1976
FWS	U.S. Fish and Wildlife Service
GBCGE	Great Basin Center for Geothermal Energy
GDP	Geothermal Drilling Permit
GW	Gigawatts
IBLA	Interior Board of Land Appeals
INEEL	Idaho National Engineering and Environmental Laboratory
JEDI	Jobs and Economic Development Impact
LCSDC	Lander County has a standing Sustainable Development Committee
LEDA	**Lander County Economic Development Authority**
LFG	Landfill Gas
MTRS	Meridian, Township, Range, Section
MW	Megawatts
MWh	Megawatt Hours
NAC	Native American Consultation
NBMG	Nevada Bureau of Mines and Geology
NDEP	Nevada Division of Environmental Protection

NDOW	Nevada Division of Wildlife
NEPA	National Environmental Policy Act
NEXRAD	NEXt-generation RADar
NOI	Notice of Intent to Conduct Resource Exploration Permits
NREL	National Renewable Energy Laboratory
NSOE	Nevada State Office of Energy
NYSERDA	New York State Energy and Research Development Authority
O&M	Operations and Maintenance
OHV	Off-Highway Vehicle
OP	Operations Plan
ORC	Organic Rankine Cycle
PEC	Portfolio Energy Credit
PEIS	Programmatic Environmental Impact Statement
POD	Plan of Development
POO	Plan of Operations
PUCN	Public Utilities Commission of Nevada
PV	Photovoltaic
REC	Renewable Energy Credits
REDS	**Renewable Energy Development Feasibility Study**
REPP	Renewable Energy Policy Project
RETAAC	Renewable Energy Transmission Access Advisory Committee
RMP	Resource Management Plan
RPM	Revolutions Per Minute
RPS	Renewable Portfolio Standard
SEIA	Solar Energy Industries Association
SHPO	Nevada State Historical Preservation Office
SODAR	SOnic Detection And Ranging
SWCC	Small Wind Certification Council
TRED	Temporary Renewable Energy Development
UNR	University of Nevada, Reno
UP	Utilization Plan
VRM	Visual Resource Management

2.0 INTRODUCTION AND STATEMENT OF PURPOSE

The Nevada mining industry has been working with the U.S. Bureau of Land Management (BLM) for many years to develop innovative ideas for sustainable development of mines and mining communities. Recently, the Lander Economic Development Authority (LEDA) has collaborated with the Nevada mining industry and the BLM to develop an innovative idea for sustainable development in Lander County: developing renewable energy facilities at existing or reclaimed mine sites on public lands. This collaboration is called the Renewable Energy Development Feasibility Study (REDS). The BLM provided a grant funded by the American Recovery and Reinvestment Act to LEDA for this purpose. The goal of REDS is to turn mine sites into viable business opportunities through renewable energy development.

The goals of this report are to assist the mining industry in incorporating renewable energy facilities into the design of a proposed mine, a currently operational mine or to convert reclaimed mining facilities on public lands to renewable energy generation facilities.

This concept, if implemented, would generate new jobs and new industry for Nevadans, along with bringing numerous benefits to the mining industry, the mining community and Nevada's energy needs. Mine sites have an advantage that sets them apart from developing renewable energy facilities on raw land; that is the abundance of infrastructure already in place from the development of the mine, namely electrical lines, substations and high grade roads. These electrical facilities are very expensive and are often abandoned in place, or removed with the reclamation of the mine. The cost savings to a renewable energy development that already has the required infrastructure in place can be significant. Additionally, the ability to combine energy resources and mineral resources could add to the long term economic viability of a mine.

Renewable energy development could create jobs, lower energy costs, and ensure economic prosperity and reduce USA dependence on foreign oil. This requires development and preservation of mine infrastructure following active mining. Integration of renewable energy development and sustainable development principles in land use management in Lander County, including public land, could enhance the well-being of communities and allow flexibility in planning for long-term, productive uses of the land.

Incorporating the principles of sustainable development into Nevada's land use plans (including federal, state, and local levels) should address the preservation of mining infrastructure for renewable energy projects. Implementation of land use plans for new and existing projects, including mining and renewable energy development, and for reclamation and closure plans will:

- allow flexibility in post-closure activities;
- create a business environment that maintains high employment and demand for construction projects;
- achieve a stable real estate market through strong employment;
- lead to clean and renewable energy development;
- result in industrial and renewable energy technology development; and,
- preserve and improve the transportation, power, and communication infrastructures.

Lander County has been involved in sustainable development efforts with the mining industry, the BLM, Great Basin College, and the University of Nevada, Reno (UNR) since 2004. In 2005, the BLM Nevada developed a sustainable development action plan for integrating sustainable development principles into the BLM's Land-Use Plan process to encourage post-closure uses of mined land. From 2005 to 2008, the BLM funded UNR and Great Basin College in studies to help BLM Nevada implement its action plan, including evaluation of BLM Nevada's Resource Management Plans (RMPs) in relation to sustainable development principles and indicators and providing recommendations for integration into its RMPs. Lander County has a standing Sustainable Development Committee (LCSDC) which includes members that represent a variety of interests such as LEDA, the Chamber of Commerce, county government and mining, among others. One of the goals of the LCSDC is to develop a regional marketing strategy for post mining site infrastructure. To facilitate this goal, the LCSDC plans to set up a database where post mining infrastructure could be posted. More information about the LCSDC may be found at: http://northernnevadapartnership.com/LanderCounty.shtml.

The mining industry has great potential to contribute to sustainable development of Lander County and can build public support for continued use of mined lands. This type of development can enrich the community long after the mine sites have been retired and can stabilize the economy in times of low mineral prices.

Lander County is comprised predominantly of public lands managed by the BLM. Nevada is currently ranked fourth in the world for gold production. Congress has created numerous laws that encourage development of mineral resources and protect and maintain a sustainable environment. To make sound decisions, BLM managers consider the social and economic well-being of the communities, environmental health of the land, the strategic need for mineral development and future environmental stewardship.

The BLM Battle Mountain District manages the public land within Lander County through a RMP. The RMP guides land allocation decisions. Most public land within Lander County is open for mineral entry and multiple-use according to the existing RMP. The BLM intends to update the current plan and address the issue of sustainable development. The land use planning paradigm has changed in Nevada BLM's RMP development process, which now includes alternate post-mining uses and land ownership opportunities.

This report is intended to be an initial guide to development of renewable energy alternatives on mine sites. This document does not include site-specific studies which will be needed to design and implement renewable energy facilities at a particular mine.

Depending on the location within Lander County, the proposed development could have several renewable energy options to consider. Most of the areas within Lander County are suitable for solar energy development. Some mine sites in Lander County may also have sufficient wind resources located near power transmission lines to be economically viable. A few mine sites may have suitable geothermal resources but none have been identified in this study. If a renewable energy resource is identified on a mine site on public land, an appropriate lease or right-of-way will be required from the BLM prior to evaluation and development.

Should a proponent seek approval of a renewable energy project on a proposed mine site or on an existing mine, then the project must be compatible with mining and be reviewed by the BLM for consistency with guidelines and performance standards for reclamation and closure. The BLM's long-term reclamation goals are to shape, stabilize, and re-establish vegetation in areas disturbed by mining to provide a sustainable and productive use of the land in conformance with land-use plans. Short-term reclamation goals are to stabilize areas disturbed by mining and protect both disturbed and adjacent areas from unnecessary or undue degradation. Renewable energy projects can be a productive use of the land.

The Federal Land Policy Management Act of 1976 (FLPMA) mandates that public lands should be "managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." Multiple-use management is defined in FLPMA as the "harmonious and coordinated management of the various resources without permanent impairment of the productivity of the lands". In addition, FLPMA mandates that activities be conducted so as to prevent "unnecessary or undue degradation of the lands."

Therefore, a renewable energy development proposed by a mining company could be considered part of the mine plan if the following conditions are met: 1) the proposed development is not excluded by the RMP; 2) it is found to be compatible with approved or approvable contemporaneous mining activities; 3) it meets the BLM's short-term and long-term reclamation and multiple-use management goals; and, 4) it does not create unnecessary and undue degradation. The BLM's land-use plan should address sustainable development that includes long-term use of mined lands for renewable energy.

This report considers the three renewable energy options that were requested by LEDA to be addressed: geothermal, solar and wind.

2.1 Transmission

In order to sell power a project needs to be connected to the transmission grid (see Figure 2.1). A series of studies needs to be performed before the renewable energy can be connected to the grid. These studies may take several months.

As of the date of this report, required studies are as follows;

- Feasibility Study (~45 days)
- System Impact Study (~90 days)
- Facilities Study (~180 days)

NV Energy is the incumbent utility in most of Nevada and owns the transmission lines within Lander County. The NV Energy transmission planning group can be reached via the following personnel and the web link below:

- For general information: contact Marilyn Franz, Transmission Services Staff Consultant: Phone: 775.834.5388

- For Interconnection applications or other contract applications: contact either Kiley McElroy, Transmission Policy & Strategy Consultant: Phone: 775.834.4802 or Pat Englin, Director Transmission Policy and Contracts: Phone: 775.834.5877
- Other Contacts: Paul Kaleta, Chief Compliance Officer Contact Information: Phone: 702.402.5690
- Brian Pauling, Director FERC Compliance Contact Information: Phone: 702.402.5797
- http://www.oatioasis.com/NEVP/index.html

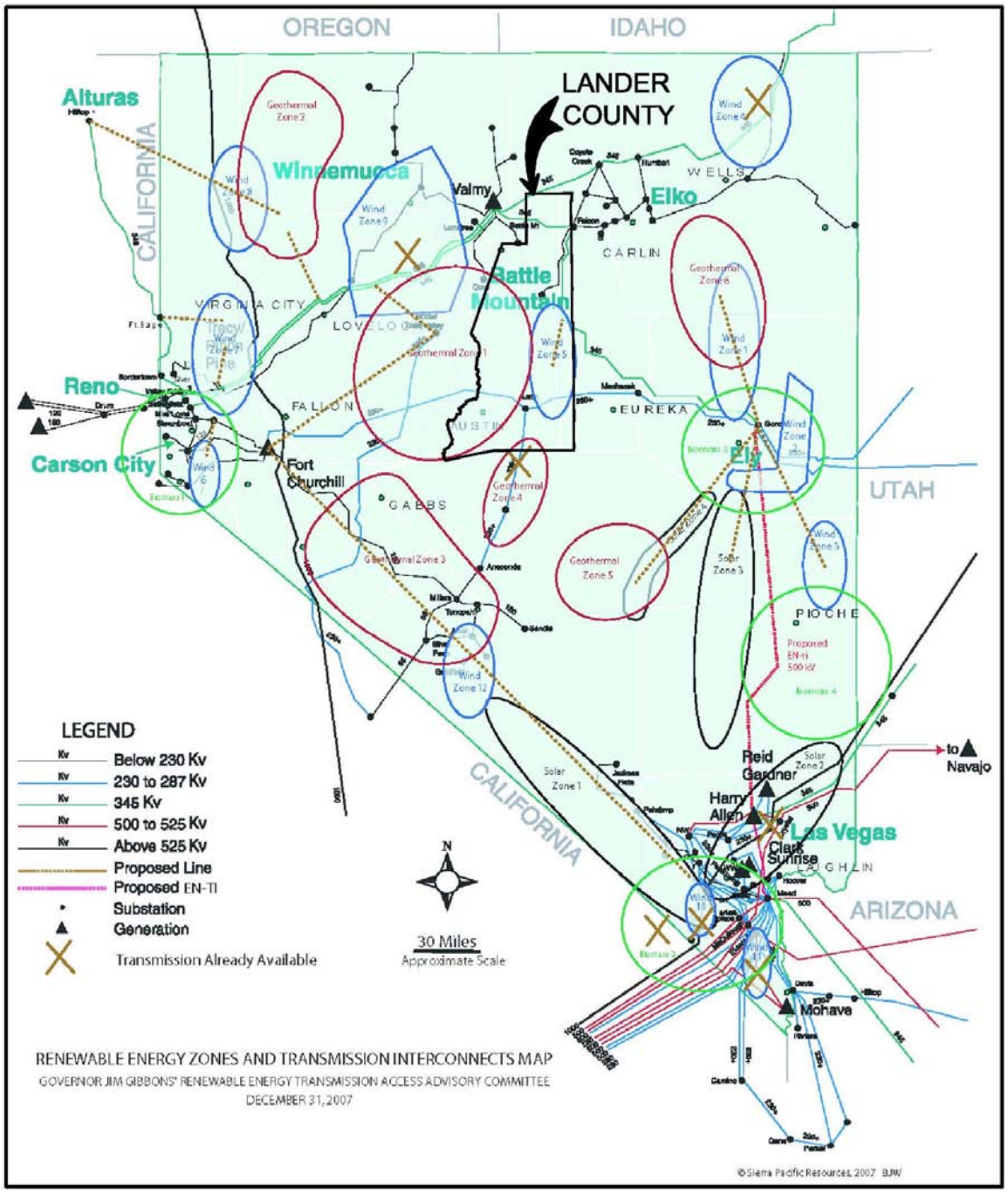


Figure 2.1: Renewable Energy Zones and Transmission Interconnection Map

2.2 Geothermal

According to the Nevada State Office of Energy (NSOE), as of May, 2011, there are currently 426 MW of commercial geothermal energy production active in Nevada (see Appendix A). Nevada is second to California in development of commercial production of geothermal energy. Projections by BLM indicate that by 2015, Nevada will have 1,473 MW of geothermal production

online and by 2025, there will be 2,880 MW online (see Table 2.1). Potential exists for significant expansion of installed megawatts when additional transmission infrastructure is built for export.

Table 2.1: Estimated Total Commercial Geothermal Development

State	2015 (MW)	2025 (MW)
California	2,375	4,703
Nevada	1,473	2,880
Idaho	855	1,670
Oregon	380	1,250
Utah	230	620
Washington	50	600
New Mexico	80	170
Alaska	20	150
Arizona	20	50
Colorado	20	50
Montana	20	50
Wyoming	20	50

From: http://www.scribd.com/doc/22557550/Geothermal-PEIS-BLM-Guide

Geothermal energy can be a cost-effective and competitive alternative to fossil-fuel-fired power plants. It is also becoming more cost competitive with other forms of renewable energy such as wind and solar. Some advantages and disadvantages are:

Advantages

- Base-load power – produces 24 hours a day/7 days a week unlike wind and solar
- Renewable energy resource
- Environmentally clean – low emissions to the atmosphere

Disadvantages

- Must be utilized at resource site – often at remote locations
- High up-front capital costs

Unlike solar or wind, a geothermal resource has little flexibility for the location of a power plant installation. The geothermal heat, whether it is in the form of steam or hot water, cannot be transported very far from the underground resource. Any loss of heat (i.e. temperature) may significantly impact the energy conversion efficiency of the power plant.

2.2.1 Geothermal Resources

Geothermal resources are classified by the U.S. Geological Survey (Circular 790, 1978) into the following types:

1. Heat flow and conduction-dominated thermal regimes. These resources include most of the United States where conductive heat flow could be tapped at depth. At shallow depths, these types of resources are suitable for heat pumps and space heating.
2. Igneous-related geothermal systems. These resources are associated with young igneous rocks such as volcanoes. Examples include active volcanoes and volcanic areas in Alaska, California, Oregon and Washington. The Yellowstone Caldera system is the largest such system in the United States.
3. Hydrothermal convection systems (>90°C). Convective circulation of hot fluids is the primary mechanism whereby the energy is transported to reservoirs near enough to the earth's surface for economical extraction. These are the type of systems common in Nevada, and the hottest of which can be used to generate electricity.
4. Low-temperature geothermal waters (<90°C). These are systems where hot or warm water is at or near the ground surface. Many warm springs in Nevada fall into this category. While these systems are not hot enough to be used to generate electricity, they may be used for direct uses such as space heating, bathing, and recreation.
5. Geopressured-geothermal resources. Resources that are created when water is trapped in sediments that are rapidly buried at great depth. Geopressured-geothermal resources have been identified along the Gulf Coast in Texas and Louisiana.

The map in Figure 2.2 was produced by the Idaho National Engineering and Environmental Laboratory (INEEL) and shows the distribution of geothermal potential in the United States.

Figure 2.2 Distribution of Geothermal Potential in the United States

2.2.2 Geothermal Resource Evaluation

The largest unknown factor in any geothermal project is the underground resource. Wells must be drilled and the reservoir must be tested to determine fluid temperatures, flow rates and chemistry, and reservoir productivity. These parameters must be understood before a power plant is designed and installed.

When the U.S. geothermal industry first started in the late 1970's, the prevailing philosophy was to drill multiple wells and build the largest power plant that the wells would likely support. The supposed economy-of-scale was a driving force, but it was eventually realized that the economy-of-scale could be a false economy if the resource was not well understood and production declined after a few years.

Today, the industry philosophy seems to have shifted to a modular concept. Now it is more common to drill two or three wells, run sufficient tests on the wells and reservoirs, and then install one or more small, modular power plants. Eventually, more wells can be drilled and more

modular plants can be installed as the resource is better understood through long-term production.

2.2.3 Geothermal Activities in Nevada

Nevada has been called "The Saudi Arabia of Geothermal Energy" because of its great geology and exploration potential, favorable regulatory climate, good infrastructure, large areas of land open to exploration, and network of knowledgeable exploration geologists, organizations, and agencies. As the demand for renewable energy increases, Nevada will play an increasingly important role in providing this valuable base load energy to the nation's energy supply.

Currently, Nevada is the second largest geothermal energy producing state in the country and continues to be among the fastest growing states in geothermal production. Nevada has 20 operating geothermal power plants with an operating capacity of 433.4 MW. In addition to those plants there are another 86 projects currently under development with an estimated operating capacity of between 2100 – 3690 MW.

Exploration and development of geothermal resources in Nevada has increased significantly in the past several years. The important factors driving this increase are:

1) the promising geology of the Great Basin,
2) a favorable regulatory climate which allows timely permitting of projects,
3) a Renewable Portfolio Standard which requires 25% of all electricity generated in Nevada be derived from renewable sources by the year 2025 (details of the Renewable Portfolio Standard can be found in Section 7.1) - Nevada has meet their Standard of 15% minimum in 2011 and 2012,
4) offices of the leading geothermal companies are in Nevada,
5) significant amounts of funding from the U.S. Department of Energy (DOE), and
6) advanced geothermal research by the Nevada Bureau of Mines and Geology (NBMG) and the Great Basin Center for Geothermal Energy (GBCGE) at the University of Nevada Reno.

In 2009, geothermal electrical production in Nevada was 2,181,460 MWh (megawatt hours) gross and 1,669,056 MWh net. The difference between gross and net represents the parasitic load used to operate the power plants. This was a 24% increase in gross and 21% increase in net power production over 2008. According to the Nevada Department of Taxation, the gross proceeds from geothermal power production were approximately $111 million in 2009, a 17% increase over 2008. Geothermal producers pay the Nevada Net Proceeds of Minerals Tax and in 2009 paid a total tax of $897,384.

Geothermal energy is produced in Nevada from several different power plants located mostly in the northwestern part of the state. The nameplate capacity of the turbines at the 11 existing sites increased from 294 MW in 2007, to 337 MW in 2008, and 425 MW in 2009.

The state's largest producer of geothermal power is Ormat Nevada, Inc., and other producers include Terra-Gen, U.S. Geothermal Power, Nevada Geothermal Power, Enel North America, Magma Energy Corp., and Homestretch Geothermal.

2.2.4 Geothermal Activities in Lander County

Based on known geothermal resources in neighboring counties and on the regional geology, it is anticipated that a geothermal resource developed in Lander County would be a water-dominated system with a temperature range of from 265° to 300° F. In order to study the potential for geothermal resources at mining districts in Lander County, several databases were obtained. Mines and mining districts were obtained from the NBMG. The mining districts are those defined in NBMG Report 47. Hot spring locations were obtained from databases compiled by the National Geophysical Data Center (NOAA), NBMG, and the Geo-Heat Center at the Oregon Institute of Technology.

Temperature and thermal gradient data for Lander County were obtained from available public databases, including those compiled by Southern Methodist University, Great Basin Center for Geothermal Energy (UNR), and the U.S. Geological Survey. Thermal gradients were contoured and are shown in Figures 2.3 and 2.4. Figure 2.3 is a map of thermal gradients, and hot springs and wells in Lander County. Figure 2.4 shows mines and mining districts overlaying the thermal gradient contours. It is important to note that the contours were computer-generated. The largest problem in contouring the data is the uneven spatial distribution of the data points over the county area. As can be seen on the maps, there are clusters of data points at some places, a fairly reasonable distribution in the northern part of the county and huge gaps without data in the southern half of the county. Thus, the contour map can be misleading. The large gradient anomaly in the eastern part of the county, and encompassing the Callaghan Ranch mining district, is most likely not real because it is defined by only two data points.

In general, there seems to be a poor correlation between mining districts and geothermal anomalies in Lander County. This poor correlation is more the result of a scantiness of geothermal exploration in the county over the years. The BLM’s issuance of new federal geothermal leases in the past three years, plus the emphasis on renewable energy, is increasing the amount of exploration of certain areas.

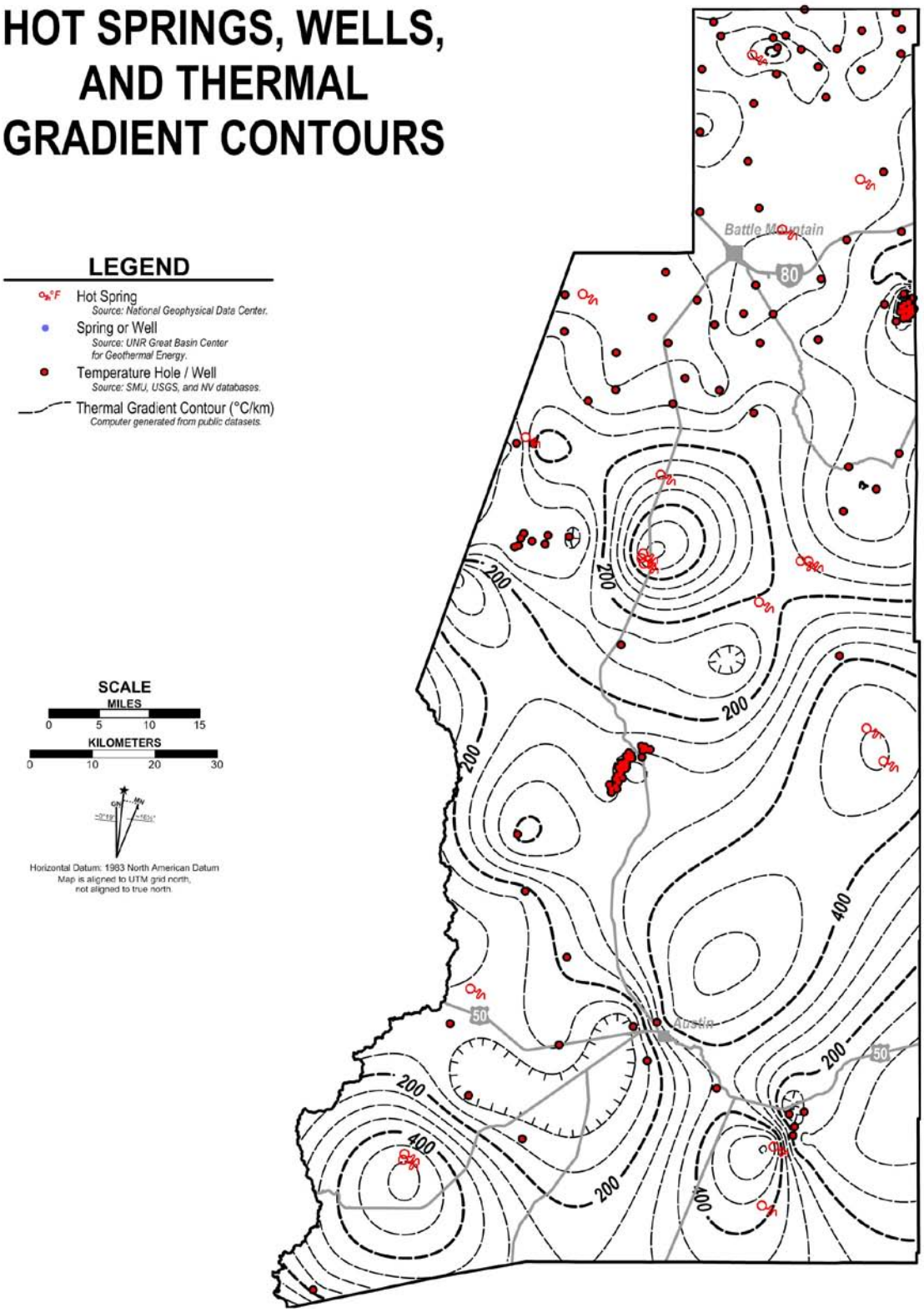


Figure 2.3: Hot Springs, Wells and Thermal Gradients in Lander County

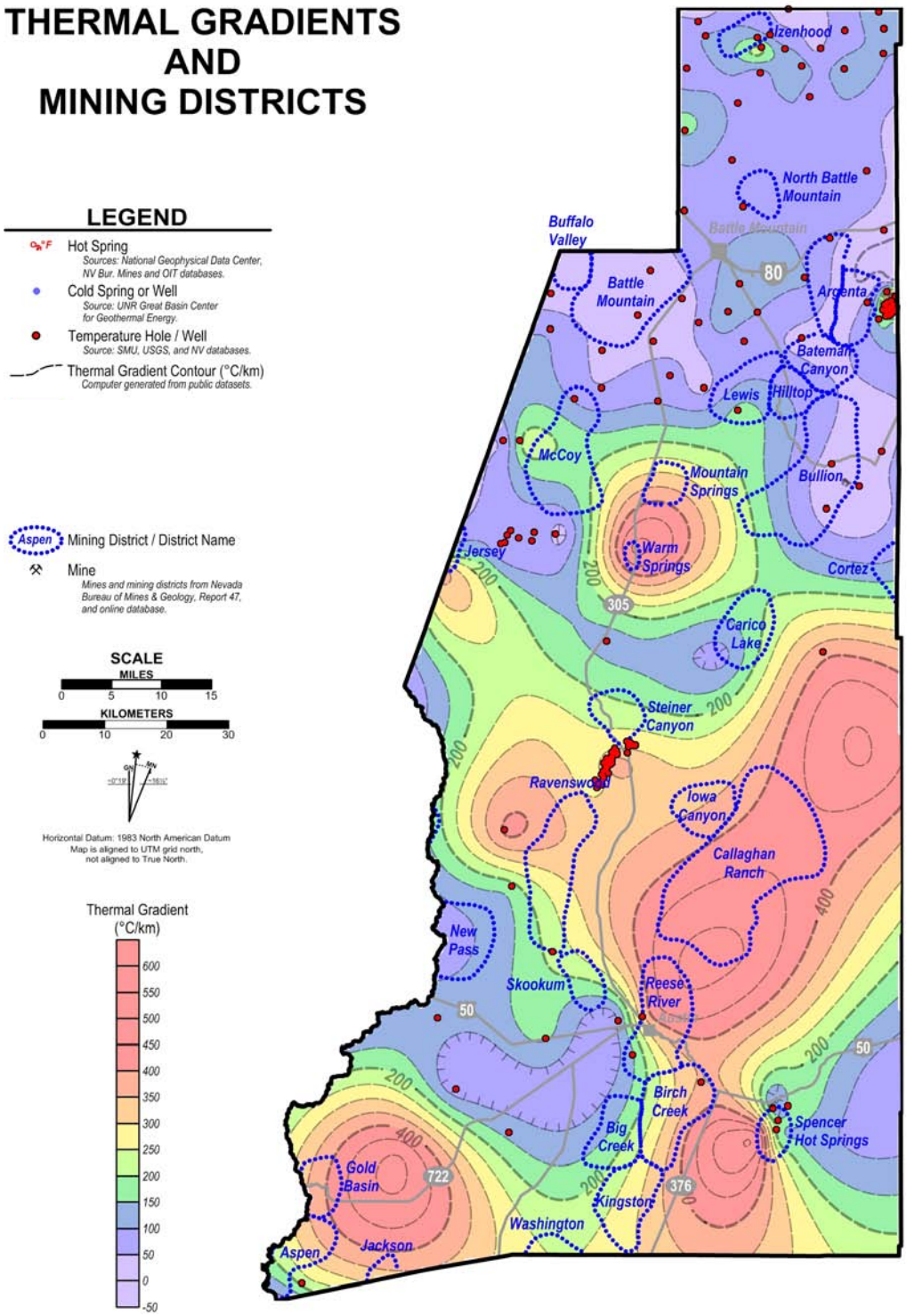


Figure 2.4: Mining Districts and Thermal Gradients in Lander County

According to the BLM's LR2000 database, there are currently four geothermal lease units in Lander County. All are comprised of leases owned by Ormat. In addition, there are nine other

areas of federal geothermal leases in the county. As shown in Figure 2.5, only about half of these leased areas are associated with, or in close proximity to mining districts.

Per BLM's LR2000, 10 of 34 geothermal leases have been issues in Lander County in the last three years (see Figure 5.2.1) and this has increased the level of exploration. The nearest operating geothermal power plant is at Beowawe in Eureka County, and newer leases have been issued in Whirlwind Valley, immediately west of Beowawe. These leases are on trend with geological structures at Beowawe and extend westward into the Argenta metallic mining district in Lander County.

Throughout the state, only a few geothermal resources are associated with mineral (metals) deposits and only a few mining areas have known associated geothermal resources. Perhaps the two best examples of mine areas with associated geothermal resources are the Florida Canyon Mine in Pershing County, and Blue Mountain in Humboldt County.

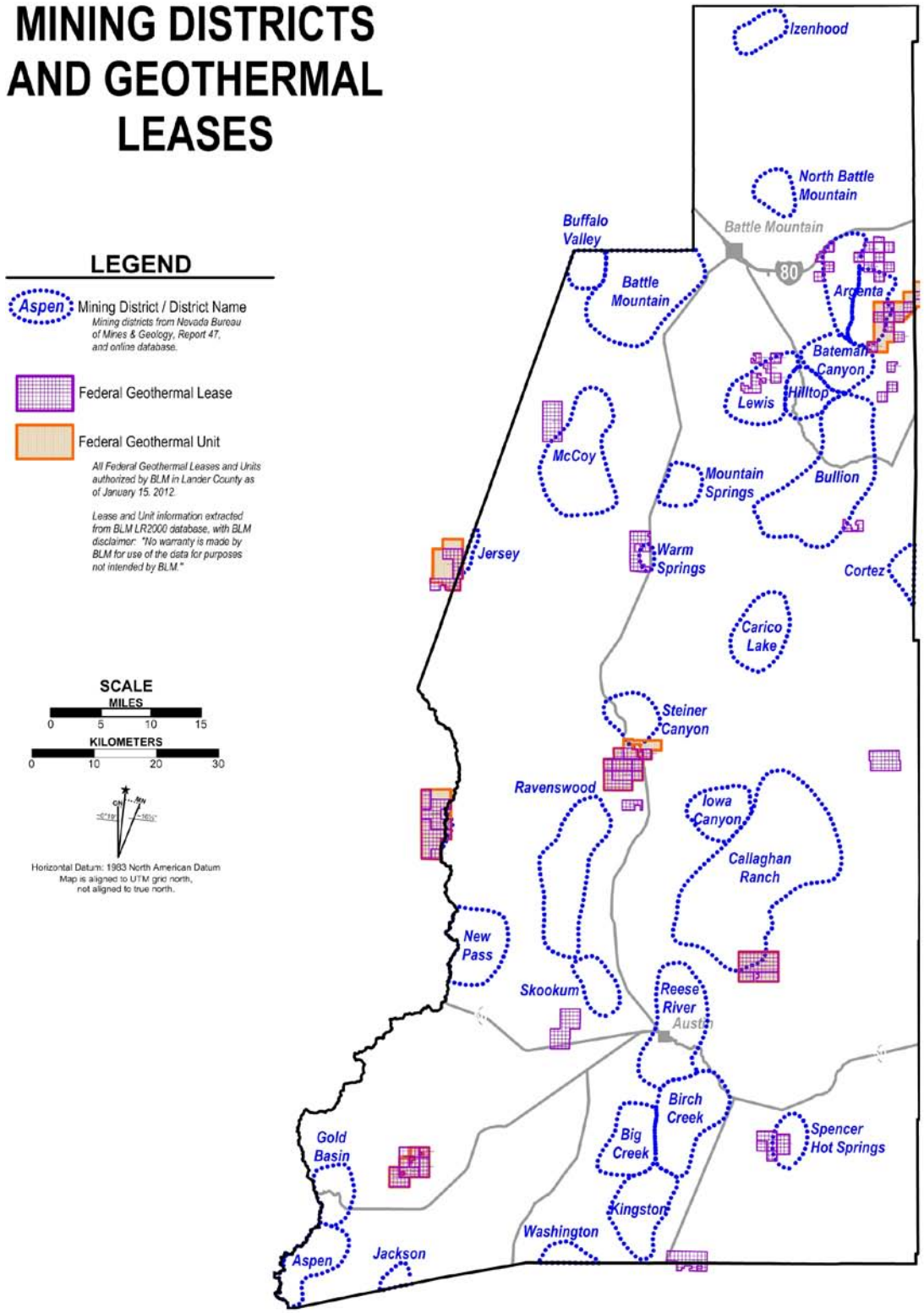
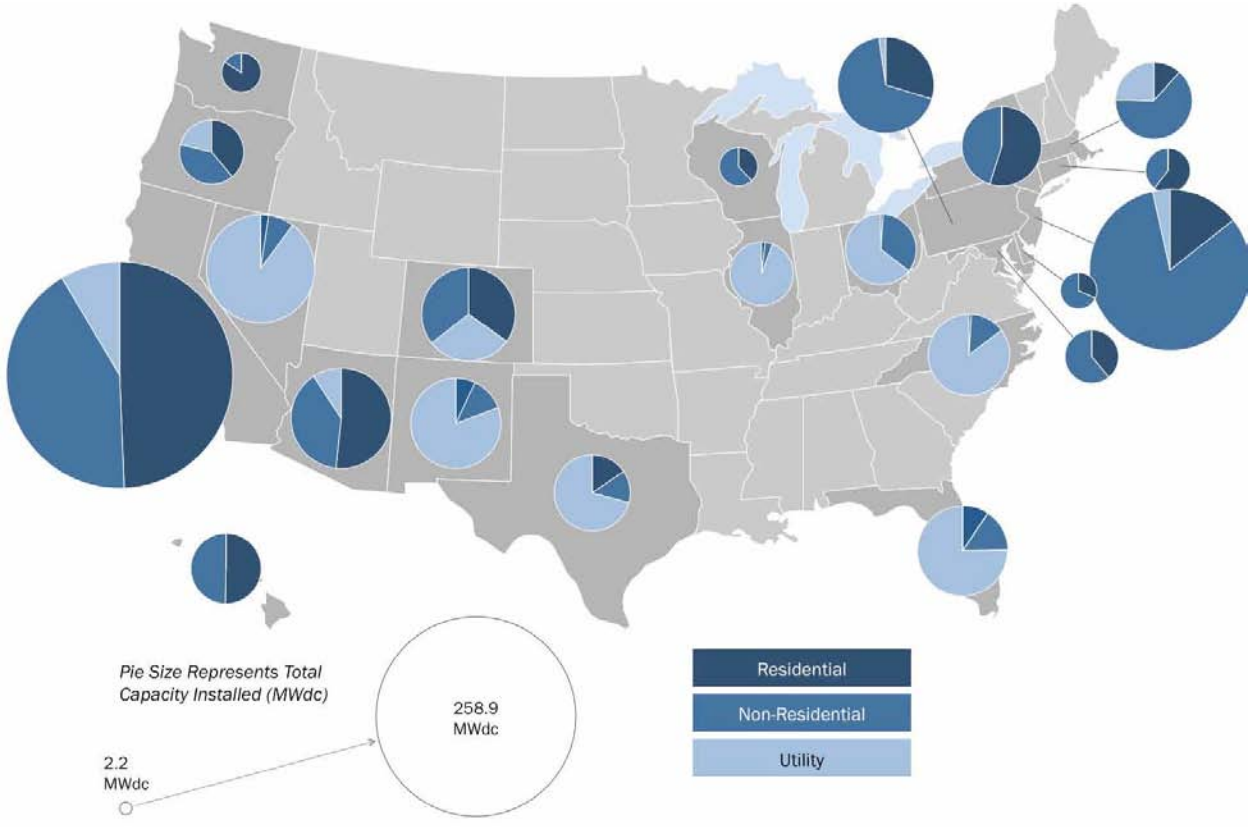


Figure 2.5: Geothermal Leases in Lander County

2.3 Solar

The total size of the U.S. solar market grew 67% from $3.6 billion in 2009 to $6.0 billion in 2010. Solar electric installations in 2010 totaled 956 MW to reach a cumulative installed capacity of 2.6 gigawatts (GW). The Solar Energies Industry Association (SEIA) reports that most photovoltaic (PV) installations which were built in Nevada in 2010 were in the utility sector, as shown in Figure 2.6. Sixteen states, including Nevada, each installed more than 10 MW of PV in 2010, up from four states in 2007.



Source: SEIA U.S. Solar Market Insight™ 2010 Year in Review Executive Summary

Figure 2.6: 2010 U.S. PV Installations by State and Market Segment

Traditionally, solar panels are the photovoltaic panels that can be seen on a building or at a small scale project. These panels can also be installed en masse to produce a significant amount of energy (see Figure 2.7). Solar panels use light energy (photons) from the sun to generate electricity through the photovoltaic effect. The structural (load carrying) member of a module can either be the top layer or the back layer. The majority of modules use wafer-based crystalline silicon cells or thin-film cells based on cadmium telluride or silicon. The conducting wires that take the current off the panels may contain silver, copper or other conductive (but generally not magnetic) transition metals.

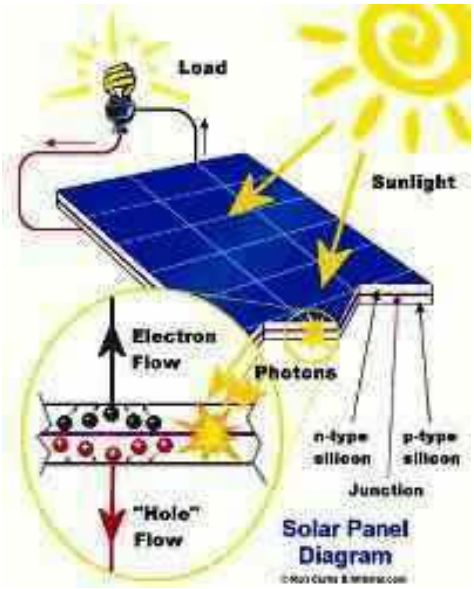


Figure 2.7: Large Scale Solar Photovoltaic (PV) Project

The cells must be connected electrically to one another and to the rest of the system. Cells must also be protected from mechanical damage and moisture. Most solar panels are rigid, but semi-flexible ones are available, based on thin-film cells.

Electrical connections are made in series to achieve a desired output voltage and/or in parallel to provide a desired current capability.

The efficiency of a PV panel depends on the specific technology employed. Thin film technology efficiencies are marginally below 10%, Polycrystalline cells over 14% and Mono-crystalline manufacturers claim efficiencies up to 21% with an energy density of greater than 13 watts/square foot. With the inherently low efficiencies of solar PV, the driving force in lowering cost has been increased production capacity. Multi-megawatt solar PV projects can be constructed for below $4.00/watt as a result. Solar PV development has an advantage over wind and geothermal in that the resource assessment phase is much simpler. The ability to develop solar PV projects in more areas that wind and geothermal (which are highly resource location dependent) allows for more flexibility to construct a project near infrastructure than the other technologies.

Concentrated Solar Power (CSP) technology uses a solar thermal method of generating electricity. The Nevada Solar One project is a CSP which is using a “parabolic trough”. This method uses mirrors to heat a pipe filled with fluid to a temperature in excess of 700° F. The heat from this fluid is transferred to water to generate steam to drive a steam turbine (see Figure 2.8). In multi-Megawatt plants, CSP provides the lowest cost solar electricity. CSP can be rapidly deployed because it uses conventional items such as glass, steel, gears, turbines, etc. Water requirements for CSP are similar to a coal-fired power plant unless dry cooling techniques are employed.

Figure 2.8: Concentrated Solar Power (CSP) Project

Another of the CSP technologies is the use of a "power tower." In this instance a tower is built several hundred feet tall and has a solar receiver located at the top which collects the sun's energy reflected off of mirrors on the ground. In turn, fluid within the tower is heated to a temperature in excess of 1,000° F (see Figure 2.9). Heat is transferred to water to generate steam which drives a steam turbine. An additional benefit of the solar thermal method of producing electricity is that the thermal energy is stored in the fluid reservoir and is capable of producing energy even after the sun has set or if the sun is blocked for a period of time.

Figure 2.9: "Power Tower" Solar Project

2.3.1 Solar Resources

Nevada receives the third highest amount of sun in the country behind Arizona and California (see Figure 2.10) which makes Nevada a prime location for solar projects. Lander County will, on average, experience 240 days of sun per year. Based upon the number of sunny days and the existing infrastructure and available land at Nevada mines, there are many favorable locations for the installation of a PV project.

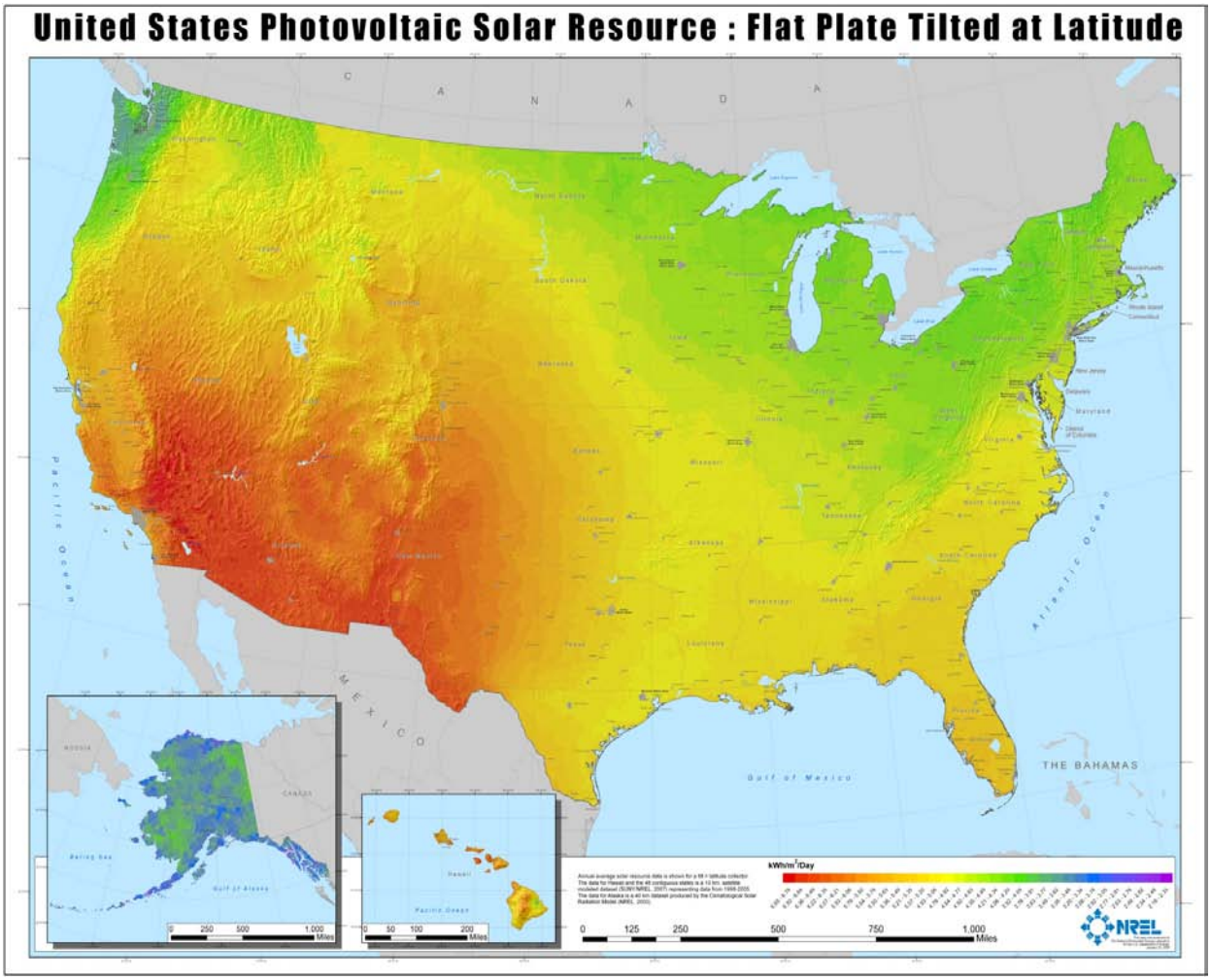


Figure 2.10: Photovoltaic Solar Resource Map

2.3.2 Solar Activities in Nevada

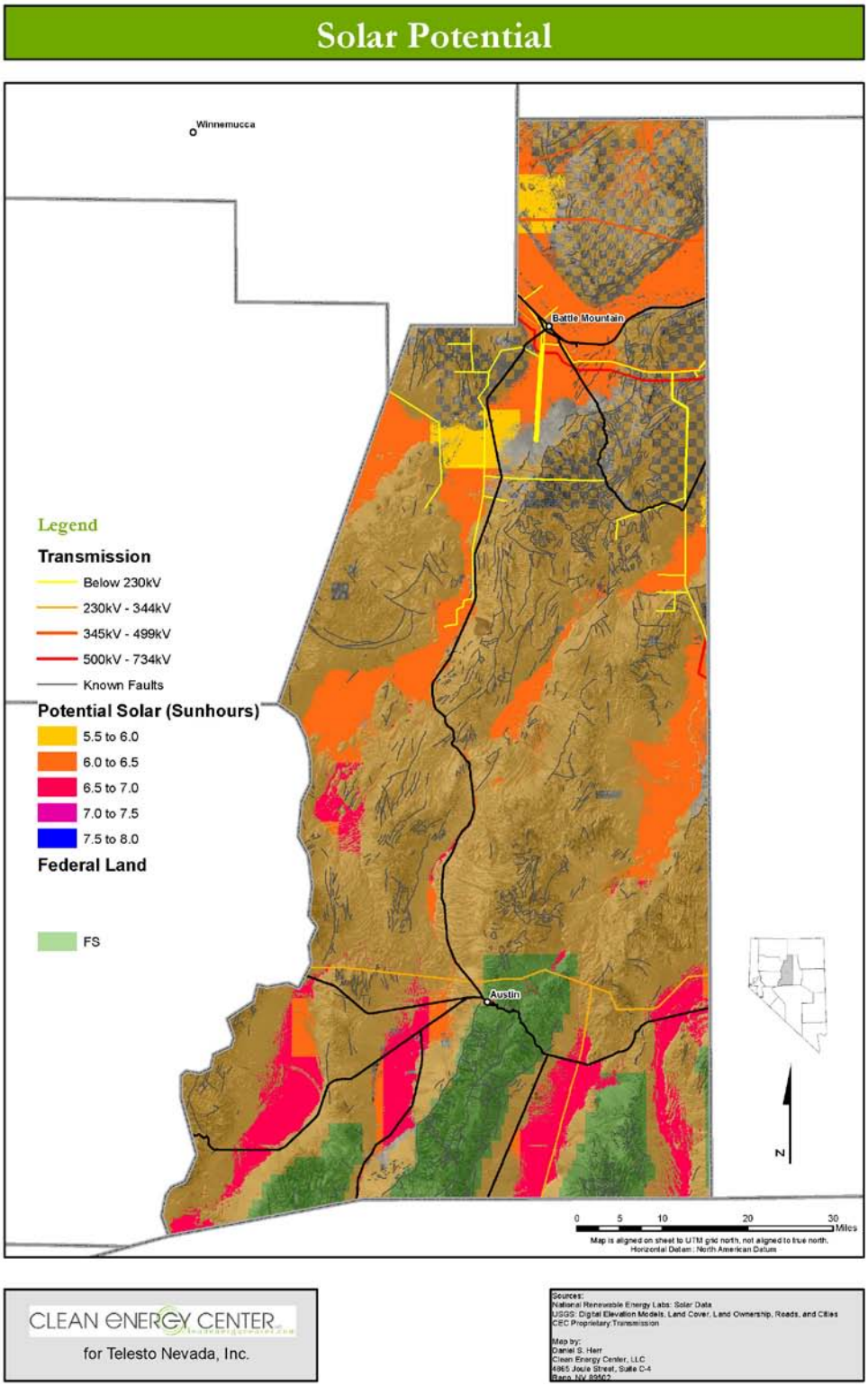
Nevada is the No. 1 state in the nation in solar watts produced per capita. Nevada's average of 270 days of sunshine combined with ample open land make Nevada an excellent location for the development of solar power. Nevada has suppliers of solar PV modules and balance of systems components to supply market and demand created by large companies, the government and small, distributed generators.

Nevada is home to one of the largest existing solar projects on the country. The construction of the Nevada Solar One Project southeast of Las Vegas was a major milestone in the adoption of solar power generation to Nevada. Nevada Solar One, a CSP project, went online in 2007 (see Figure 2.11). This project produces 64 MW which is enough to provide electricity to 14,000 homes during the peak usage time in Las Vegas. Most of the commercial solar projects in Nevada which are active or are in development are located in either Clark or Nye County (Nevada State Office of Energy, Appendix A).

Figure 2.11: Acciona's Nevada Solar One Project Near Las Vegas (from Acciona's website)

2.3.3 Solar Activities in Lander County

As of May, 2011, there are no commercial solar power projects in Lander County (refer to Appendix A). Figure 2.12 shows the solar energy potential of Lander County.



Note: All land not shown as private or FS lands is managed by the BLM

Figure 2.12: Solar Energy Potential of Lander County

2.4 Wind

Wind is the result of differences in temperature and pressure. Wind turbines turn kinetic energy within the wind into electricity. The amount of energy within the wind is cubed with every doubling of wind speed. Modern wind turbines are highly sophisticated and reliable machines. The availability (when the wind is blowing and the turbine available to generate electricity) of a wind turbine is approximately 98%. These are much different machines than the early generations from the 1980s. Newer wind turbines generate vastly more power than the machines of the 1980s. The very large size of modern wind turbines allows for a few machines to generate very large quantities of electricity. One modern wind turbine produces as much electricity as 30 or more wind turbines from the 1980s. Thus, fewer wind turbines are required to produce more power.

Utility scale wind turbines currently range in size from 1.5 MW to 6 MW. They range in size from approximately 330 feet to just over 600 feet. Hub heights of 200 to nearly 400 feet and rotor diameters ranging from 250 to over 400 feet are now available (see Figure 2.13). The predominant wind turbine design for utility scale machines is what's known as the "Danish Design" consisting of three horizontally aligned rotor blades mounted to a nacelle upwind of the tower (see Figure 2.14). The blades collect kinetic energy from the wind and rotate at 14-20 revolutions per minute (RPM), turning a drive shaft which then connects to a gear box and a generator. Power is then transmitted through a collection system on site to the transmission grid or user facilities for consumption.

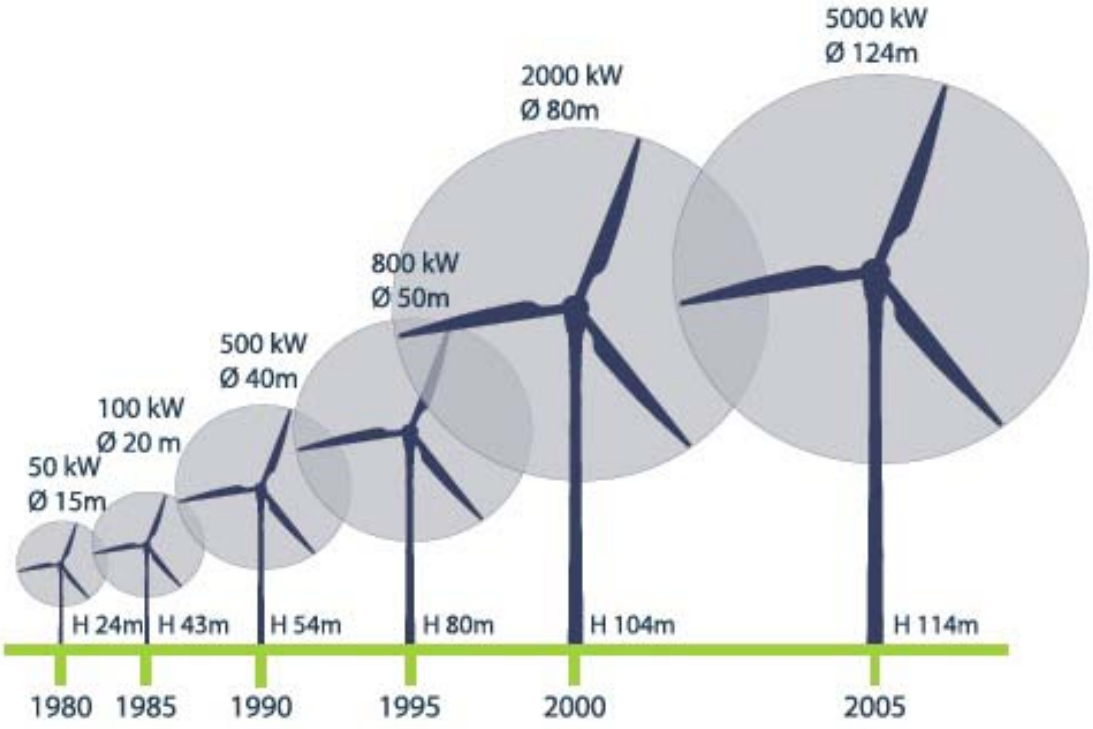


Figure 2.13: Wind Turbine Size Increases as Technology Advances

Figure 2.14: Major Elements of a Wind Turbine

Proper siting of wind turbines is critical. Wind turbines literally need to be "in the wind" which, in Nevada, is usually on or near the ridge tops. Additionally, they require spacing between turbines to avoid losses from turbulence and the resulting loss of power due to closely spaced machines. Thus, fewer than 5 wind turbines per mile would typically be located on a ridge and additional rows of turbines would need to be constructed over half a mile downwind of another row. This limits the number of wind turbines that can be installed on a project, but provides higher capicity factors and lower operations and maintenance costs.

Additionally, factors such as environmental, aviation and telecommunication impacts, sound and viewshed need to be considered when siting wind turbines. Wind power production uses very small amounts of water, has a small footprint, has no fuel costs, provides jobs and tax benefits to the local economy, produces no greenhouse gases and lowers the amount of money sent to foreign countries for energy.

An area with a relatively low wind speed will require a higher price of power to be economically viable. Other factors such as environmental issues, location in relationship to transmission lines and site-specific construction considerations all contribute to the economics of a wind energy project. The location of mining development in remote locations can assist in lowering the costs of wind energy projects. Mines require large amounts of infrastructure that can be of use for wind energy development. Transmission lines, substations and high grade roads are the most important of these.

The economic impact of wind energy projects can be significant, as shown in Figure 2.15:

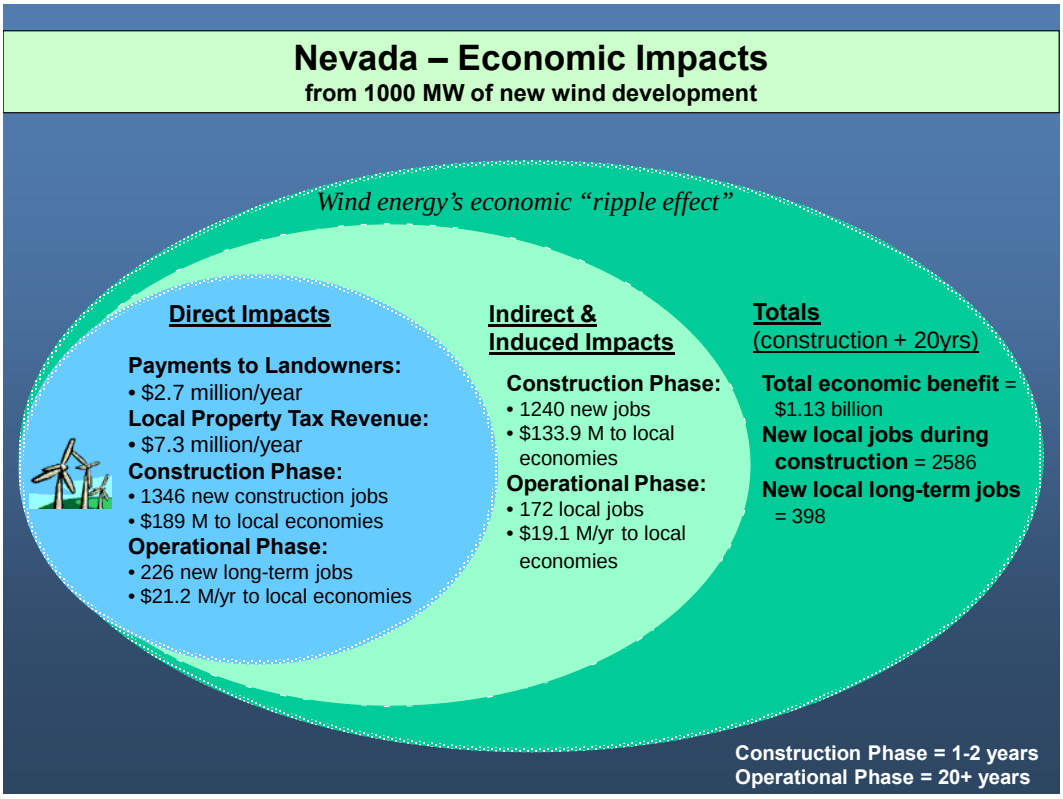


Figure 2.15: Economic Impacts of Wind Energy Projects (From NREL)

2.4.1 Wind Resources

The 80-meter (262-foot) wind map (Figure 2.16) shows that much of Lander County has average wind speeds in excess of 6 meters per second (13.4 mph). Seven meters per second (15.7 mph) is presently considered the minimum wind speed for a viable project. However, complex terrain requires site-specific studies which may find higher wind speeds than the models indicate. Additionally, newer wind turbine technology is making lower wind speed sites more economically viable. Thus, mines currently being developed and operated will be candidates for wind energy development.

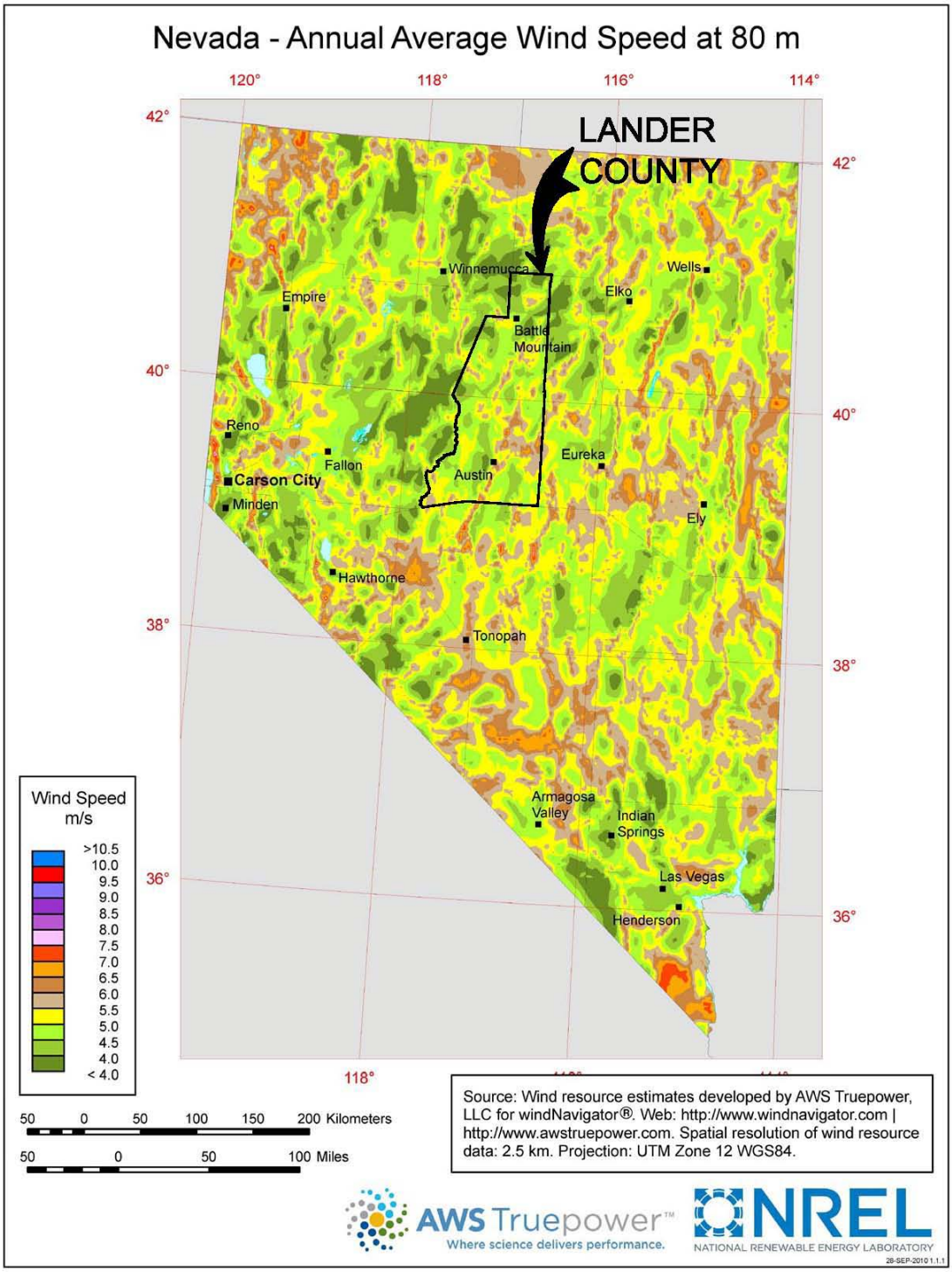


Figure 2.16: 80-Meter Wind Map

Lander County has significant wind resources located near transmission lines and on ridges above mine sites. Higher wind speeds are generally found at higher elevations. Some ridge lines are too high in elevation to be practical for wind energy development. Elevations above

8,000 feet can have production problems in both summer and winter. In summer, wind power generation can be difficult at high elevations. Air density decreases with increasing altitude. Warmer air is also less dense than colder air. When temperatures increase in the summer, the reduction of density due to temperature combined with the lower density at altitude results in reduced production from wind turbines. In winter, storm driven extreme winds and heavy ice accumulations can reduce production and increase maintenance costs. The predominantly north/south orientation of the basin and range and westerly wind direction decrease the wind speeds in most valley locations to below levels that are capable of producing enough power to be economical.

Other factors may offset the loss in production and allow wind projects with lower wind speeds to be economically viable. These factors are: private land (lower permitting costs), proximity to infrastructure (transmission, substations and high grade roads), lower construction costs on flat land, previous environmental impacts and environmental data from mine site Environmental Impact Statement's (EIS) lowering permitting costs and proximity to load centers at mine sites.

To obtain data suitable for determining the financial feasibility of a wind energy project, on-site wind measurements need to be acquired. At least one year – and most commonly three years of data needs to be collected before deciding if a location has a viable wind resource. If the observed data shows sufficient wind speeds, further study is warranted.

2.4.2 Wind Activities in Nevada

Wind power is in production in every state in the West except Nevada (see Figure 2.17).

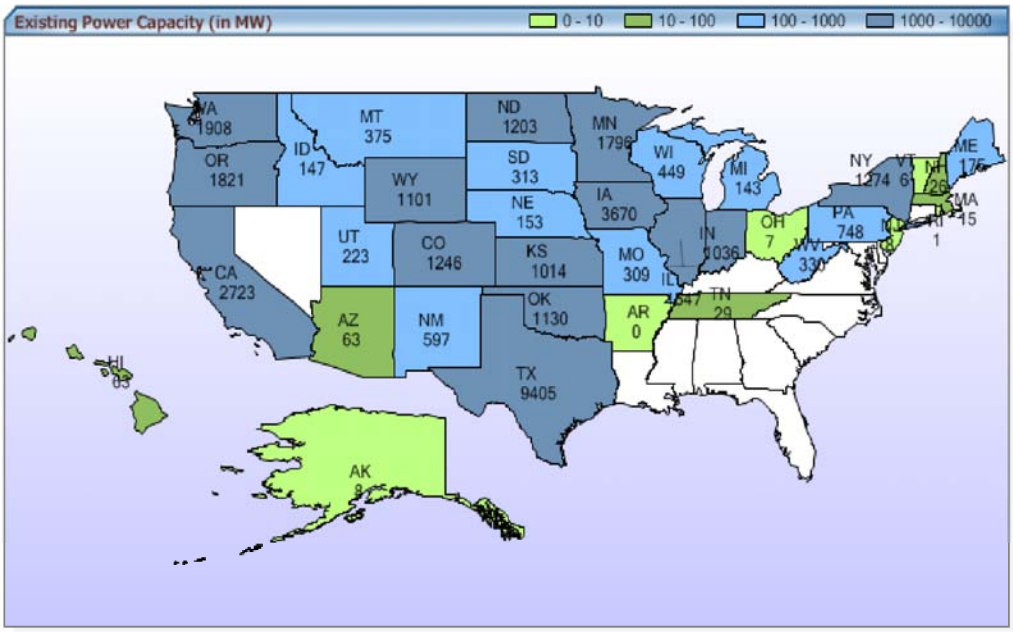


Figure 2.17: Existing Wind Power Capacity in the U.S. (in MW)

Despite the great wind potential, Nevada has no utility scale wind energy projects in production at the time of this report. Five wind projects are under development in Nevada as of May, 2011 (see Appendix A). Total capacity for the five developing wind projects is 820 MW.

2.4.3 Wind Activities in Lander County

Wind energy is much like mining in that a developer is constrained by the location and quality of the resource. A wind energy plant cannot be built in a location without a wind resource robust enough to support the construction and operation costs of the plant in a profitable manner. This study focused on a high level view of wind energy development possibilities in Lander County. The intent is to assist in repurposing mine sites or incorporating wind energy into the design of mine projects. Mining operations require extensive environmental studies (including air quality measurements) which can easily be adapted to include wind energy. Additionally, mines require large amounts of energy and the associated infrastructure needed to transmit and use it. This costly infrastructure can serve to both lower the cost of a wind energy project as well as the cost of mine closure by leaving it in place to serve the wind energy plant. The environmental impacts of the mine are also lessened by lower pollution and “double dipping” in regards to the impacts of the infrastructure. Wind energy is also a hedge against both high energy costs and low commodity costs by leveling energy costs and providing a revenue stream when mineral prices dip. It also adds a revenue stream after the mineral resources have been depleted.

At this time, the BLM does not report any wind projects in development in Lander County although wind projects are in development near Ely in eastern Nevada and near Searchlight in southern Nevada. Refer to http://www.blm.gov/nv/st/en/prog/energy/fast-track_renewable.html for a list of renewable energy projects in Nevada. Figure 2.18, which is from the BLM, shows that a wind testing right-of way is authorized in Lander County near Interstate 80, just east of Battle Mountain.

According to NREL, 1,000 MW of wind energy development can provide nearly 400 long term jobs, over 2,500 construction jobs and over $1 billion in total economic impact (see Figure 2.15).

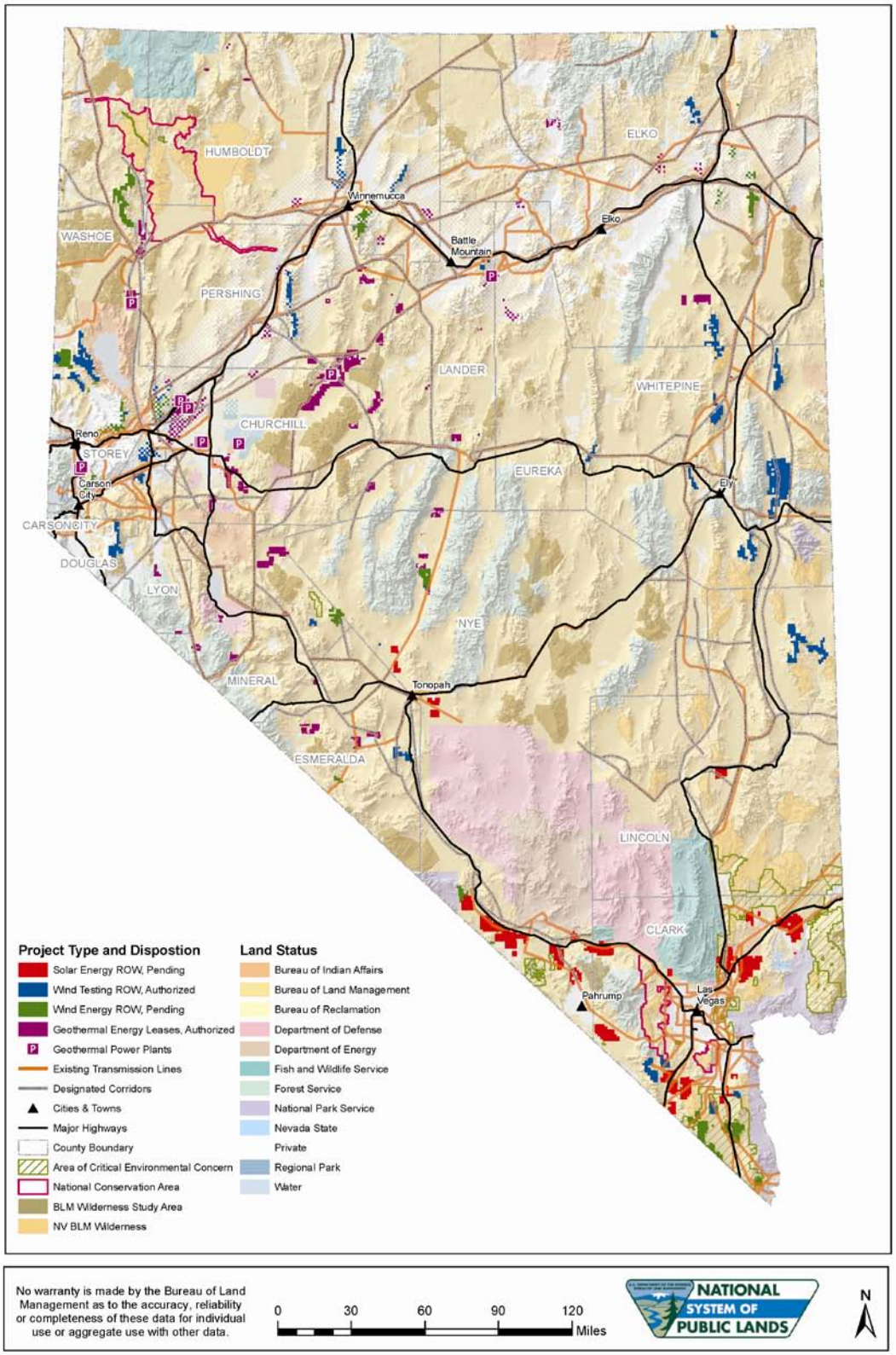


Figure 2.18: Nevada Renewable Energy Projects (Source: BLM)

Shosh

Wind turbines may be a good renewable energy option for the mines located within Lander County (see Figure 2.19). The decision to use wind turbine technology will be a site-specific decision and the preliminary review of its potential should be based on the wind map. When looking at the map, areas with an average wind speed of 7 meters per second (15.7 mph) or higher would be the target areas (see Figure 2.20). The map indicates that wind on the one Mesa and Argenta Rim areas show promise of sufficient wind speeds on land that will not be too difficult or costly on which to construct a wind project.

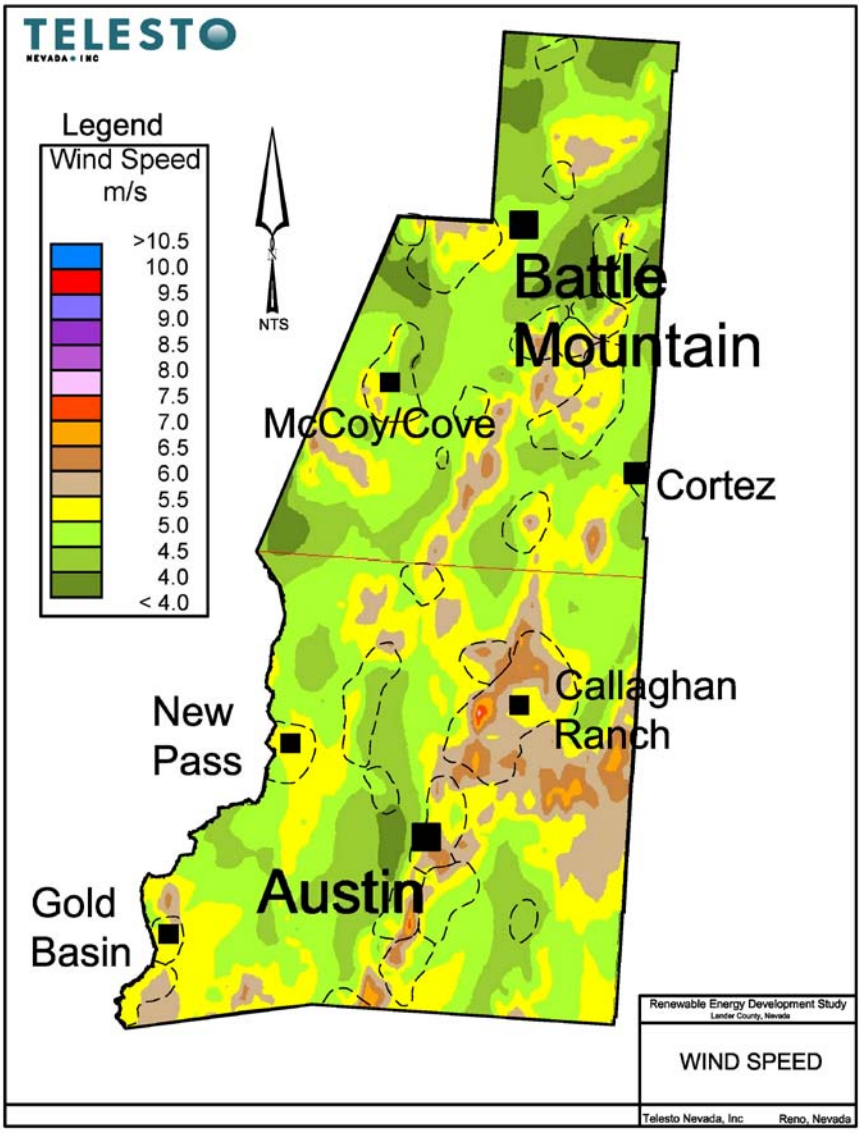


Figure 2.19: Wind Speed Contours for Lander County

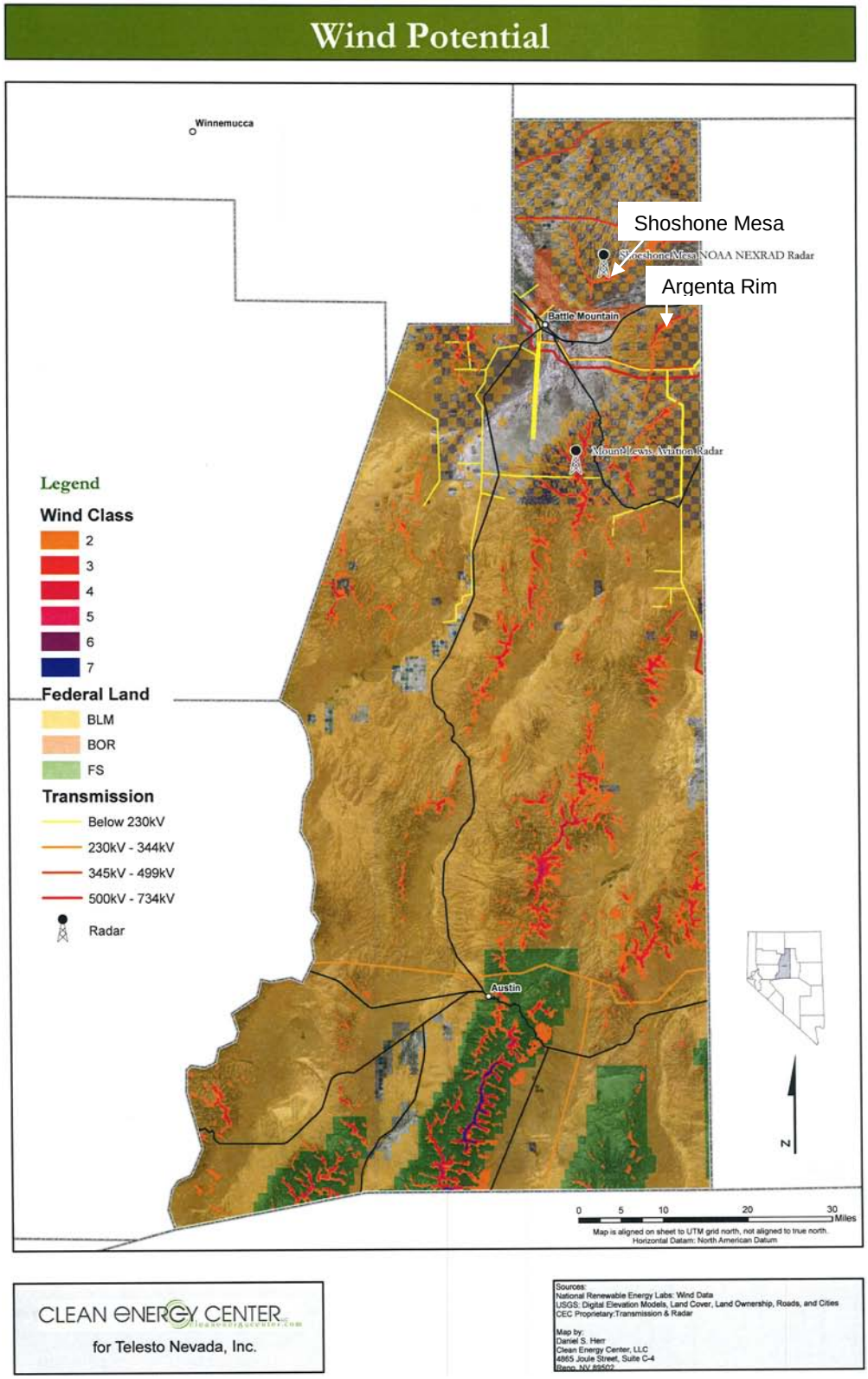


Figure 2.20: Wind Energy Potential of Lander County

As of the writing of this report, there are no commercial wind energy projects in Lander County. However, NV Energy possesses multiple high voltage transmission lines that pass through Lander County near Austin, near interstate 80, over the Argenta Rim and south through Crescent Valley to the Cortez mine areas. These paths are convenient to wind development in northern and southern Lander County. Additionally, the substations serving the mines and other infrastructure can be used to tap the existing transmission lines thus lowering the interconnection costs. The Renewable Energy Transmission Access Advisory Committee (RETAAC) identified transmission and renewable energy zones in Nevada (see Figure 2.1).

2.5 Other Renewable Energy Resources Considered but not Evaluated

2.5.1 Landfill Gas (LFG) Energy

Large municipal or industrial landfills produce gas that can be tapped to generate electricity. Microorganisms that live in organic materials such as food wastes, paper or yard clippings cause these materials to decompose. Decomposition produces landfill gas, typically comprised of roughly 60 percent methane and 40 percent carbon dioxide (CO_2). The U.S. Environmental Protection Agency (EPA) requires all large landfills to install collection systems at landfill sites to minimize the release of methane. Gas collection is accomplished by drilling vertical wells into the placed waste and installing collection pipes off of the drilled well sections. Vertical wells are typically installed at a spacing of one well per acre. These collection pipes run to a central location where the LFG is released into the air or flared off. Typically the gas is moved in the collection pipes using a blower or a compressor to create a vacuum on the wells. During the process of converting the landfill gas to energy, the gas is used as fuel in a combustion turbine to generate the electricity. One of the major benefits of generating electricity from LFG is that it is a continual process. Electricity from LFG will be generated 24 hours a day, 7 days per week as opposed to the solar or wind turbine energy sources.

Waste Management Corporation currently supplies landfill-gas to over 115 projects in North America, which provides the equivalent of over 550 megawatts of electricity, enough to power more than 400,000 homes; a combined savings of over 2.2 million tons of coal per year. In addition to these existing projects, Waste Management is in the planning stages for installing three electricity generating engines at the Lockwood Landfill outside of Reno.

A brief list of benefits of turning LFG to energy is:

- Projects help destroy methane, a potent heat-trapping gas.
- Projects generate renewable energy and offset the use of non-renewable resources such as coal, natural gas, and oil.
- There are many cost-effective options for reducing methane emissions while generating energy.
- Projects help reduce local air pollution.
- Projects create jobs, revenues, and cost savings

Due to the current population size of Lander County, the opportunity for LFG development is limited.

2.5.2 Biomass

The term "biomass" encompasses diverse fuels derived from timber, agriculture and food processing wastes or from fuel crops that are specifically grown or reserved for electricity generation. Biomass fuel can also include sewage sludge and animal manure. Some biomass fuels are derived from trees. Given the capacity of trees to regenerate, these fuels are considered renewable. Burning crop residues, sewage or manure – all wastes that are continually generated by society – to generate electricity may offer environmental benefits in the form of preserving precious landfill space OR may be grown and harvested in ways that cause environmental harm. In terms of capacity, biomass power plants represent the second largest amount of renewable energy in the nation.

At present, most biomass power plants burn lumber, agricultural or construction/demolition wood wastes. Direct combustion power plants burn the biomass fuel directly in boilers that supply steam for the same kind of steam-electric generators used to burn fossil fuels. With biomass gasification, biomass is converted into a gas - methane - that can then fuel steam generators, combustion turbines, combined cycle technologies or fuel cells. The primary benefit of biomass gasification, compared to direct combustion, is that extracted gasses can be used in a variety of power plant configurations.

Because biomass technologies use combustion processes to produce electricity, they can generate electricity at any time, unlike wind and most solar technologies, which only produce when the wind is blowing or sun is shining. Biomass power plants currently represent 11,000 MW - the second largest amount of renewable energy in the nation.

There are a number of technological options available to make use of a wide variety of biomass types as a renewable energy source. Conversion technologies may release the energy directly, in the form of heat or electricity, or may convert it to another form, such as liquid biofuel or combustible biogas. While for some classes of biomass resource there may be a number of usage options, for others there may be only one appropriate technology.

In this study, a suitable source of biomass near mine sites was not identified.

2.5.3 Pumped Storage

Pumped-storage hydroelectricity is a type of hydroelectric power generation. At times of low electrical demand, excess generation capacity is used to pump water into the higher reservoir. When there is higher demand, water is released back into the lower reservoir through a turbine, generating electricity. Reversible turbine/generator assemblies act as pump and turbine (usually a Francis turbine design). Nearly all facilities use the height difference between two natural bodies of water or artificial reservoirs. Pure pumped-storage plants just shift the water between reservoirs, while the "pump-back" approach is a combination of pumped storage and conventional hydroelectric plants that use natural stream-flow. Plants that do not use pumped-storage are referred to as conventional hydroelectric plants; conventional hydroelectric plants

that have significant storage capacity may be able to play a similar role in the electrical grid as pumped storage, by deferring output until needed.

Although the losses of the pumping process makes the plant a net consumer of energy overall, the system increases revenue by selling more electricity during periods of peak demand, when electricity prices are highest. Pumped storage is the largest-capacity form of grid energy storage now available.

The relatively low energy density of pumped storage systems requires either a very large body of water or a large variation in height. Some mines may be able to utilize elevation differences in their dewatering operations for placement of hydroelectric turbines to scavenge power. Mines with pit lakes may be suitable for developing post-mining pumped storage opportunities. An example of a successful pumped storage project is the Eagle Crest Pumped Storage Project in California. Two mined-out pits with an elevation difference of 1,500 feet comprise the storage reservoirs for the project, which has a total generating capacity of 1,300 MW. See the following website for more information: http://www.eaglemountainenergy.net/index2.html

2.6 Innovative Ideas

2.6.1 Hybrid Systems

Hybrid systems combine several methods of power generation together which results in output which is equal to or higher than single method power plants. Problems that are generally associated with certain renewable energy sources can be overcome by using more than one source of energy in one power plant facility. In a dedicated solar plant, power generation decreases or ceases when the sun is not shining. Wind facilities cannot produce power when the wind is not blowing. By combining geothermal, solar, wind, hydro and/or traditional hydrocarbon-based power plants, a hybrid facility can produce power more consistently and reliably than a single-source facility. Also, in areas where a renewable energy resource is sub-economic as a stand-alone resource, combining two or more technologies may result in an economically viable hybrid system.

Hybrid power plants are being built in several locations around the world and as the technologies are perfected, more hybrid facilities are likely to be planned. The following examples of hybrid plants are summarized in this report:

- Colorado Integrated Solar Project: CSP (solar) + coal
- Palmdale (California) Hybrid Power Plant: CSP (solar) + natural gas
- Karaman, Turkey: Power tower (solar) + wind + natural gas
- Neuried, Germany: Geothermal + biogas

Colorado Integrated Solar Project

The world's first hybrid coal-solar power plant is operating outside Palisade, Colorado (the Colorado Integrated Solar Project). In a traditional coal-fired power plant, coal that has been pulverized into a fine dust is burned to heat water until it becomes steam. The steam then turns the blades of a large turbine, which turns the generator and produces electricity. But if the water in the system is heated before it enters the boiler, less coal is needed to make the steam – and that is the principal behind a solar-coal hybrid power plant. The hybrid plant in Colorado uses CSP (parabolic trough solar collectors) to heat the water that goes into the coal-fired turbine, which will reduce the amount of coal used at the facility by 2 to 3 percent.

The project's demonstration goal is to produce the equivalent of one megawatt of electric power from renewable solar energy at the plant's existing 49-megawatt coal generating unit. But its larger goals are to show that less coal can be used while generating the same amount of electricity, reducing emissions from the plant, and testing the commercial viability of concentrating solar integration.

Palmdale (California) Hybrid Power Plant

The City of Palmdale, California, has proposed to construct, own, and operate the Palmdale Hybrid Power Plant, an innovative 570 MW electric generating facility (see Figure 2.21). It will combine a natural gas fired combined-cycle turbine technology with CSP equipment – parabolic trough solar collectors.

The combined-cycle equipment utilizes two natural gas-fired combustion turbine generators, two heat recovery steam generators, and one steam turbine generator. The CSP equipment utilizes arrays of parabolic collectors to heat a high-temperature working fluid. The hot working fluid is used to boil water to generate steam. The combined-cycle equipment is integrated thermally with the solar equipment at the heat recovery steam generators and both utilize the single steam turbine generator that is part of the Palmdale Hybrid Power Plant.

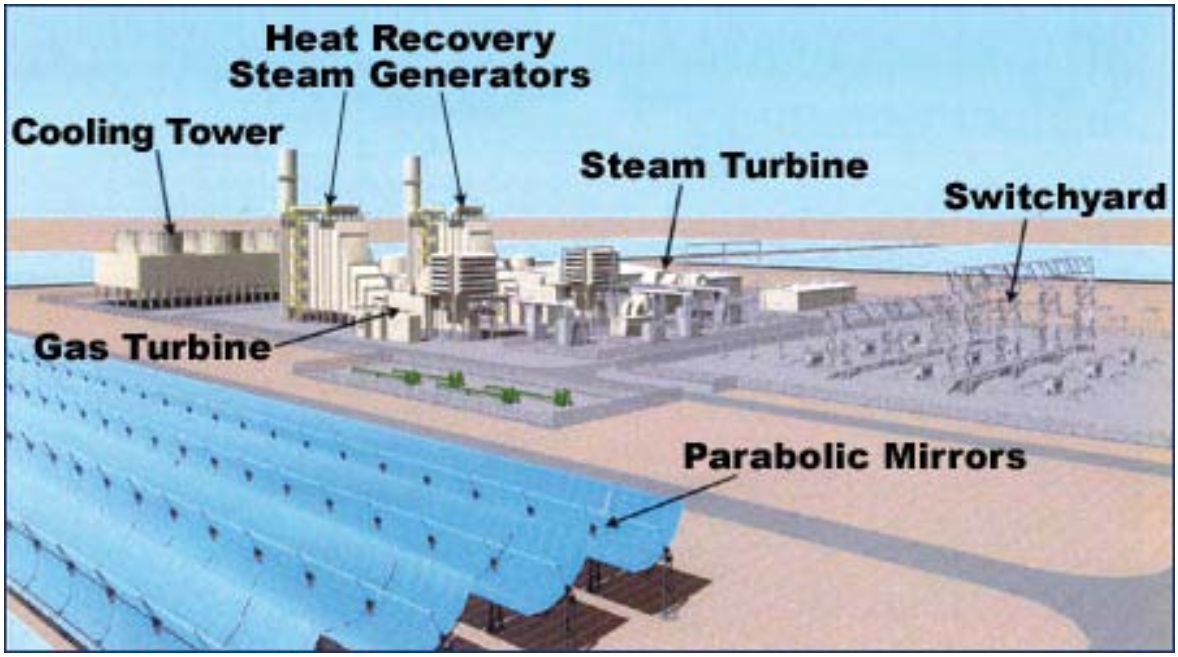


Figure 2.21: Proposed Palmdale, California Hybrid Power Plant

Karaman, Turkey

A new hybrid power plant to be built in Turkey will combine a traditional gas-fired steam turbine with solar thermal power and wind power. The solar component is a power tower system. Steam which is produced will be fed into the steam turbine to increase the plant's output. A small wind farm connected to the plant will provide another 22 megawatts of power.

The plant will produce 522 megawatts in total, with 450 of that coming from the natural gas plant, so its renewable portfolio is not exactly robust. The natural gas component smooths out the variability problems inherent in wind energy. When it's not blowing, natural gas will generate steam to spin the turbines.

Neuried, Germany (Rhine River Valley)

In many regions in Germany, the temperature of geothermal brine that can be tapped in natural reservoirs generally stays below 120° C (248° F). The production of electricity is economically not feasible in most of these areas because with low temperatures the degree of efficiency and thus the amount of produced power is small. A hybrid geothermal-biogas process can make the relatively low temperature geothermal resources economical.

In a fermentation process, methane is produced and then combusted in gas engines. These engines drive a generator which feeds electricity into the grid. With the help of a heat exchanger, the heat of both the mufflers and the cooling system of the engines are fed into the power-producing cycle of the geothermal power plant. If the temperature of the geothermal power cycle amounts to 105° C (221° F), the cycle can be heated up to about 120° C (248° F), depending on the size of the biogas plant. This increase of efficiency is calculated for a power

plant built under the local conditions of the Upper Rhine Valley. A temperature rise of more than 10° C results in increasing the gross degree of efficiency of the geothermal power production by 0.8%. In addition, up to 2.4 MW of heat can be supplied for the geothermal power process. Thus, by the hybrid concept, the geothermal plant will generate about 500 kW more power leading to an increase of about 10% compared to the common stand-alone solution.

The hybrid plant in the Upper Rhine Valley will generate up to 44,000 MWh of power per year, supplying up to 28,000 people with electric power. In comparison to a conventional natural gas power station, the emission of CO_2 can be reduced by up to 18,000 tons per year.

Other Hybrid Possibilities

A Wind-hydro hybrid power system is designed to generate a continuous supply of electrical energy using two fully renewable energy sources: pumped hydro storage and wind energy. The hybrid combination has been the subject of long-term discussion, and is expected to be first implemented in 2011 on the Spanish island of El Hierro.

Wind energy is usually delivered directly to the electrical grid, to be distributed according to grid needs and prices. Hybrid wind-hydro power systems dedicate the unneeded portions of their wind power resources to pumping water upwards into pumped storage reservoirs, where the water becomes a source of potential energy. Such closed-loop reservoirs are an implementation of grid energy storage.

Wind and its power generation potential is inherently variable. However, when this energy source is used to pump water into reservoirs at an elevation (the principle behind pumped storage), the potential energy of the water is relatively stable and can be used to generate electrical power by releasing it into a hydropower plant when needed.

Hybrid wind-hydro power systems may have application to mine sites where a pit lake will develop following mining.

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3.0 ENGINEERING AND DEVELOPMENT

This section will describe the engineering and development of renewable energy systems on mine sites. Because the infrastructure that is present in a typical mine is similar to the infrastructure which is needed for a renewable energy project, mines are logical locations to consider developing renewable energy. The mine site could be active or approaching reclamation and closure.

This section also details the requirements for engineering a renewable energy project. The following criteria are based on the assumption of a 10 MW project model. Smaller capacity projects may be feasible but will most likely result in a higher cost per MW.

3.1 Mine Site Access and Infrastructure

A typical Nevada mine is an open pit mine that produces gold and silver (or base metals) by heap leaching or milling. Although industrial minerals are also mined in Lander County, those mines are outside the scope of this project.

Common components of a typical mine in Lander County would include: an access road to the property, a high-voltage power line with a substation, a well field and domestic water tank, a mine pit, waste rock disposal areas, a heap leach pad with a recovery plant (or mill and tailings impoundment), maintenance buildings, mine office buildings with restrooms, internal power lines, telephone lines, outside storage areas and parking lots. Many of these facilities could be used during or following mining to support renewable energy development.

Current laws require that the mine post a reclamation bond with a state or federal agency to pay for the removal of most of the infrastructure components listed above following permanent mine closure.

Conversion of the useful portions of the infrastructure to energy facilities could reduce the bond cost to the mine operator and provide significant savings to a renewable energy project. In order to incorporate a renewable energy project into the mine development and closure plans, engineering will be required to enable the conversion to be performed. Detailed engineering plans will need to be developed for each component of the mine facility that will be used for a long-term energy project. If possible, these designs should be included with the initial mine development plans so that the needs of the energy facility are built into the mine project prior to closure.

3.2 Engineering Design

The following general issues may be used as a guideline for engineering design of mine components for renewable energy development.

3.2.1 Electrical Considerations

Power lines connecting the property to the electrical grid should be designed and constructed for the long term. Cost sharing arrangements between the mine owner, the energy project

developer, and the transmission utility should be negotiated during mine design. The substation and metering should be designed to permit energy to flow in either direction.

3.2.2 Earth Slope Design

South facing cut and fill slopes should be evaluated for potential solar development. Cut slopes may include pit walls and road cuts. Design of these slopes to accommodate a PV installation could involve incorporation of frequent access benches for installation and maintenance of equipment. Fill slopes may include the southern facing portions of waste rock disposal facilities, heap leach pads, tailings impoundment dikes and roadway fills. Frequent benches rather than long slopes could be incorporated in the design to enhance solar installations. Both cut and fill slopes will need to be evaluated by a geotechnical engineer to provide adequate long term factors of safety prior to construction.

3.2.3 Access Roads

Mine roads are typically designed to accommodate large equipment for all-weather access. Service roads for construction and maintenance of wind turbines, geothermal plants and solar fields will also need to provide all-weather access and opportunities for snow removal.

3.2.4 Buildings

Many of the buildings constructed for mining will be larger than required for the long term energy project; however it may be cheaper to convert one building to serve as office, shop and warehouse for the energy facility, than to build new facilities for each of these functions.

3.2.5 Open Pits

Open pits may be useful following mining as storage reservoirs for cooling water for geothermal generating plants or for pumped storage projects. If used, engineering may be required to design a pumping system from the pit. Monitoring and water treatment may be required to provide suitable quality water for the needs of the energy project and environmental protection.

3.2.6 Waste Rock Disposal Facilities

The outer slopes of waste rock fills can be designed with access benches to accommodate a solar installation; however the waste rock is not typically compacted during placement and will settle as the rock weathers and possibly due to seismic shaking from earthquakes. Therefore, individual foundations should be designed to accommodate settlement or provided with mechanical adjusting devices to provide proper alignment for operation. The top surfaces of waste rock fills will also settle and should not be used for large buildings that require footings or mat foundations.

3.2.7 Tailings Impoundments

Tailings impoundments are typically earth dams that impound ground rock residue following milling and mineral extraction. Southern exposures of the earth dams have good potential for locating solar installations. These fills are made with compacted soil and rock and would have very adequate foundation characteristics. The surface of a tailings impoundment could

potentially be used for water storage for a solar thermal pond or cooling water, but should probably not be considered for placing a PV installation or buildings due to long term settlement issues as the tailings dry out and consolidate. There may also be chemical compatibility and corrosion issues with structural components of facilities constructed on tailings impoundment surfaces.

3.2.8 Mineral Redevelopment

Designs for renewable energy development should consider that changes in mineral economics may make additional portions of the ore bodies economic in the future – particularly if major portions of the infrastructure remain. It may be prudent therefore to locate renewable energy facilities where there is minimal conflict with potential mineral resources and areas that could be needed for development of those resources. For example: if the southern exposures of heap leach pads or waste rock disposal facilities are developed for solar installations, the future expansions should be planned toward the other directions allowing for consideration of dust and wind direction relative to future mining activity.

3.2.9 Maintaining Reclamation Soil Covers

Reclaimed soil covers are a feature of many reclaimed mine facilities. The soil covers are installed to act as a growth medium for vegetation and to inhibit meteoric water from contacting and leaching chemical constituents from mine wastes. The installation of renewable energy infrastructure would have the potential to reduce the effectiveness of soil covers, if installed on reclaimed mine facilities with a cover. Solar power infrastructure takes several forms which may require excavated foundations or may have footers that can be installed on the ground surface. Because of their height, wind power infrastructure typically requires an excavated foundation.

The need to preserve soil cover integrity may be limiting factor in converting closed mine facilities to renewable energy platforms. The integrity of the soil cover will need to be accounted for in the infrastructure design, which may include options such as:

- Surface footers in lieu of excavated foundations,
- Excavated foundations designed to preclude infiltration through the cover,
- Avoidance of areas where cover integrity significantly affects closure performance (e.g., heap leach facilities, acid-generating waste rock areas), or
- Relocation of infrastructure with foundation needs to areas without soil covers.

3.3 Geothermal Plant Engineering Components

It is assumed that a geothermal power plant in Lander County will be a binary system. Binary systems are often called heat-exchanger or organic Rankine cycle (ORC) systems. Hot water is pumped through a heat exchanger where the heat is transferred to a working fluid such as isopentane that is vaporized. The choice of working fluid is determined by the geothermal fluid

temperature. The vapor then drives the turbine to generate electricity. After going through the turbine, the working fluid is cooled back to liquid form and recycled through the heat exchanger. The cooled geothermal fluid is re-injected into the ground. Figure 3.1 is a schematic diagram illustrating the binary system.

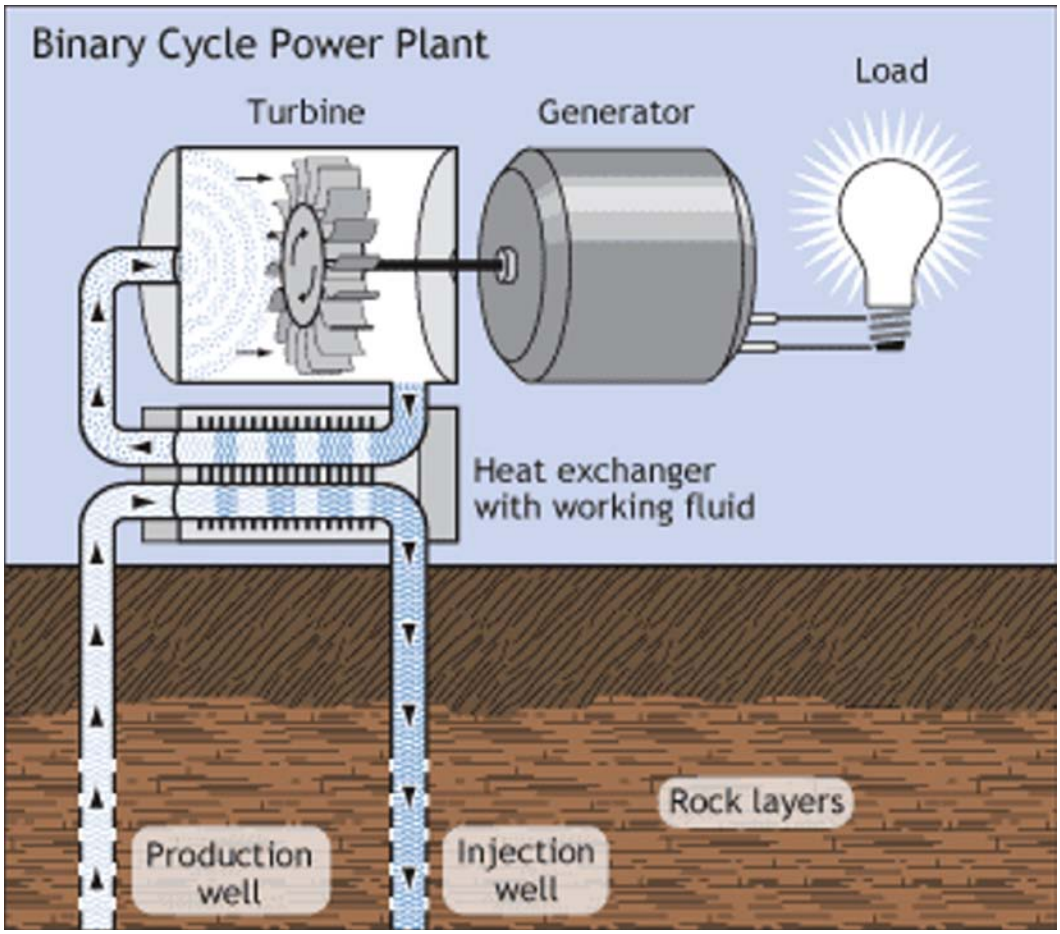
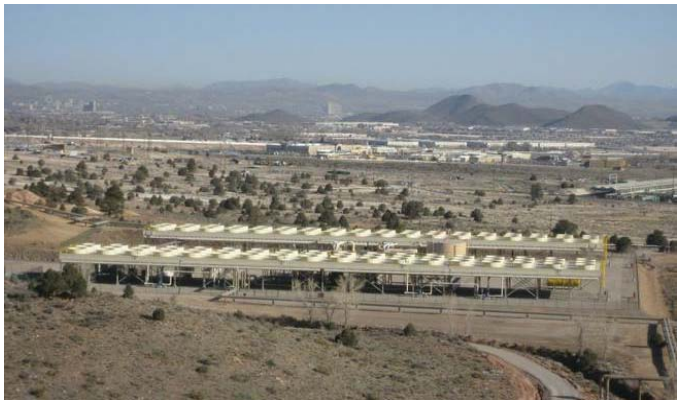


Figure 3.1: Binary Cycle Geothermal Power Plant

Specific components of a geothermal facility will need to be accommodated in the general arrangement of mine infrastructure. These components may include:

- Production wells
- Reinjection wells
- Cooling water facilities
- Piping
- Heat exchangers and generators
- Electrical connections



- Access

3.4 Geothermal Plant Development

Typically, there are five major phases of a geothermal development project:

1. Leasing
2. Exploration
3. Permitting/drilling
4. Utilization
5. Abandonment and reclamation

As a co-development with a mining project, portions of these stages may not be needed; however, additional site-specific engineering and environmental assessments may be required. At each stage, the BLM can issue site-specific conditions of approval to protect resource values.

Leasing public land for geothermal exploration and development is a competitive process which is controlled by the BLM. The leasing process usually proceeds through the following steps:

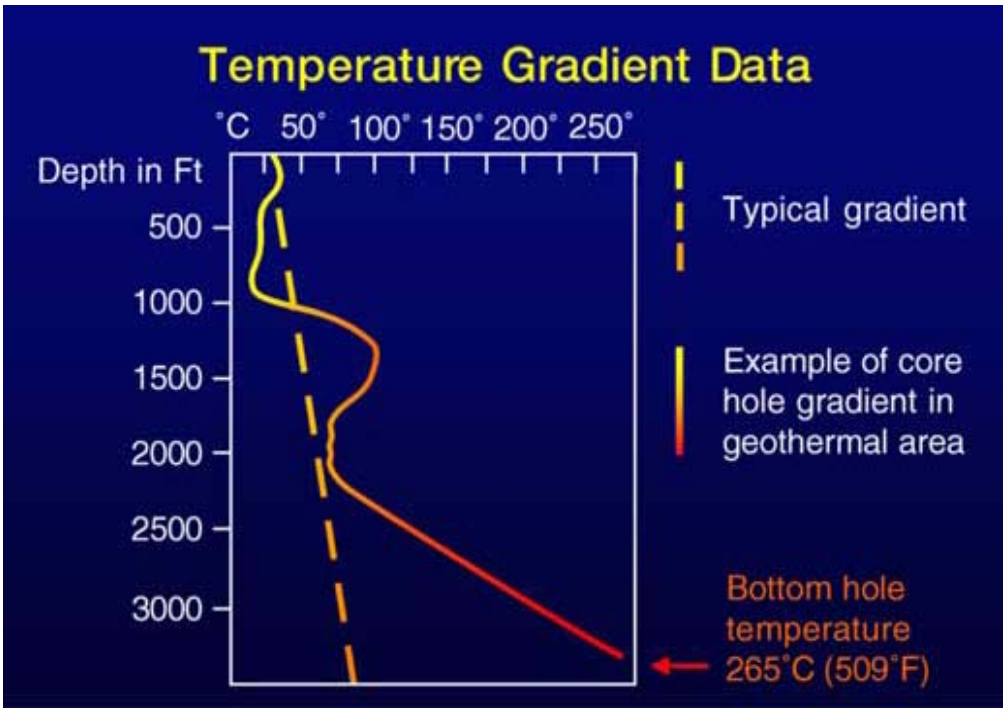
1. BLM posts a notice for nominations of lands for competitive geothermal leasing
2. Interested parties submit nominations
3. BLM reviews nominated parcels for availability, environmental, and cultural concerns. Where National Forest System lands are involved, the Forest Service and BLM jointly review and conduct National Environmental Policy Act (NEPA) analyses for the nomination.
4. An Environmental Assessment (EA) or EIS may be required for leasing
5. BLM posts the final list of parcels and applicable stipulations (45 days prior to lease sale)
6. BLM holds a competitive lease sale
7. After the BLM receives the bid form and all monies due, the lease will be issued

Leasing is subject to the Geothermal Steam Act of 1970 which governs leasing federal lands for geothermal resource development. Section 222 of The Energy Policy Act of 2005 modified the Steam Act to allow only competitive lease sales for federal geothermal resources. The BLM holds a lease sale at least once every two years (43 CFR 3203.13). A geothermal lease grants the lessee access to geothermal resources in the lease area for a period of ten (10) years. Figure 2.5 shows geothermal leases on public land in Lander County.

The preliminary investigations needed for development of a geothermal plant are very intensive. It usually takes three years or more to do resource exploration, lease land and obtain permits for exploratory drilling. That period can be stretched out even longer if the mineral rights on the

property are shared by several holders or if there are sensitive environmental or cultural issues. Geothermal resource evaluation could cost millions of dollars.

After identifying lands with good geothermal potential, a prospective developer will need to obtain a drilling permit and then drill shallow temperature gradient holes, slim holes and full size deep wells. Temperature-gradient wells are often drilled to 150 meters (500 feet) in depth with diameters of 4 to 7 inches. See Figure 3.2 for an example of temperature gradient data obtained from a typical geothermal target. Temperature gradient data for Lander County needs to be acquired on a case by case basis. Slim-hole exploration wells are usually drilled from 200 to 1,000 meters (500 to 3,000 feet). The size and objective of the development will determine the number and type of wells to be included in exploratory drilling programs. Exploration operations do not include drilling wells intended for production or injection.



Note: Site-specific temperature gradient data from Lander County may differ from what is shown here.

Figure 3.2 Example of Temperature Gradient Data

Permitting and drilling a geothermal target requires close cooperation between the operator and the BLM. A typical permitting process proceeds as follows:

1. Operators must contact BLM to schedule a pre-kickoff meeting
2. Operator compiles info to apply for approval of drilling operations (43 CFR 3261.11)
3. BLM and operator meet onsite to discuss issues
4. BLM prepares a preliminary EPA document

5. BLM consults with partners as necessary – ie. The Nevada State Historical Preservation Office (SHPO), U.S. Fish and Wildlife Service (FWS), Nevada Division of Wildlife (NDOW), Tribes
6. BLM reviews the operations plan, drilling program, bonds, and NEPA document
7. BLM initiates public involvement
8. Following all reviews, the BLM may issue Finding of No Significant Impact (if applicable) and a Record of Decision

If a well is not a temperature gradient hole, a geothermal drilling permit (GDP) is required. Four regulatory items are required to receive a GDP. A BLM Form 3260-2 needs to be completed and signed. An OP which describes the drilling pad, access roads and facilities related to drilling and testing will need to be submitted to the BLM as well. It should include measures for environmental protection and mitigation. A checklist which can be used to ensure completeness of the OP may be found in Appendix C.

The next requirement is a description of the drilling program which details the technical and operational aspects of drilling, completing and testing.

Lastly, an acceptable bond must be posted with the BLM. No operations may commence until after BLM approves the GDP. The drilling permit, drilling program and operations program can be submitted together. Most drilling operations will also require a BLM Right-of-Way or a USFS road use permit for access roads needed for lease. An operator must submit a geothermal well completion report within 30 days after drilling a well.

If the exploration well data reflect that the location is a suitable site for a geothermal energy development in conjunction with a mine operation or mine reclamation project, the design should be incorporated with the mine infrastructure design.

Typically drilling costs 30-50% of a geothermal project's total cost. Each geothermal well costs between $1 to $5 million to drill and a geothermal power plant may consist of 6 – 20 wells depending on the temperature of the water, productivity of the wells and the output of the plant. Depending on the quality of the geothermal resource, wells can be drilled to a depth of 200-1,500 meters (656-4,921 feet) for low-medium temperature systems to depths up to 3,000 meters (9,842 feet) for high temperature resources. Wells can be drilled vertically or at an

angle. Wells are drilled in a series of stages, with each stage being of smaller diameter than the previous stage, and each being secured by steel casings, which are cemented in place before drilling the subsequent stage. The final production sections of the well commonly use an uncemented, perforated casing, allowing the geothermal fluid to pass into the pipe. The objectives of this phase are to prove the existence of an exploitable resource and to delineate the extent and the characteristics of the resource. An exploratory drilling program may include shallow temperature-gradient wells, “slim-hole” exploration wells, and production-sized exploration/ production wells.

The size requirements of the project will be dependent on the quality of the resource. It is very difficult to determine any quantifiable data for the size of the project or the output of the plant prior to preliminary drilling has been completed and reviewed. NV Energy possesses multiple high voltage transmission lines that pass through Lander County near Austin, near interstate 80, over the Argenta Rim and south through Crescent Valley to the mine sites there. These paths are convenient to geothermal development in northern and southern Lander County. Additionally, the substations serving the mines and other infrastructure can be used to tap the existing transmission lines thus lowering the interconnection costs. The RETAAC identified both transmission and renewable energy zones in Nevada. Although transmission lines and mine infrastructures are present, there will be additional design and infrastructure required to connect the geothermal plant to the power grid.

Regulations at 43 CFR 3270 outline the procedures for utilization of a geothermal resource, including electrical generation facilities. After production ceases at a geothermal power plant, the site must be reclaimed. Operators are required to follow BLM procedures for well and facility abandonment. Reclamation must occur according to BLM specifications.

There are several benefits to geothermal power plants. As compared to other renewable energy options, geothermal plants require a relatively small amount of land. An entire geothermal field may use only 1–8 acres per MW versus 10-15 acres per MW for wind turbines and 6-10 acres per MW for solar panels. Geothermal plants also run at a very high efficiency. They are not dependent on any outside sources such as the sun or the wind to generate electricity. Geothermal plants are capable of running almost constantly.

3.4.1 Geothermal Project Footprint

A 10 MW binary geothermal power plant has a square footprint of approximately 125 feet by 125 feet. This includes the heat exchangers, turbine generators, and condensers. Cooling systems of older geothermal power plants in Nevada were standard water cooling towers. However, newer plants are mostly air cooled by a series of large fans. Air cooling generally requires a larger footprint than water cooling. The footprint of the cooling system will be larger than the power plant modules. The power plant modules have a footprint of about ½ acre; the cooling system will have a footprint of about 1½ acres. Figures 3.3 and 3.4 show the newest 10 MW geothermal binary power plant installed in the Western United States. It is at Raft River, Idaho and owned by U.S. Geothermal Inc. of Boise, Idaho.

Figure 3.3: Overview of the 10 MW Ormat Geothermal Power Plant at Raft River, Idaho. (Photo from U.S. Geothermal Inc.)

Figure 3.4: 10 MW Ormat geothermal power plant at Raft River, Idaho. (Photo from U.S. Geothermal Inc.)

The Raft River geothermal power plant is water cooled because the area has an abundance of cool water, much of which is used to irrigate the nearby farms. In dryer areas, the newer geothermal power plants are air cooled, thus eliminating the need for cooling water and consumptive water rights. The two best examples are the new plants at Salt Wells and Stillwater, Nevada. Both of these plants in Churchill County are air cooled and do not require any consumption of water. All of the geothermal water is re-injected into the ground after the heat is removed.

Pit lakes may be a resource for cooling water if present at a mine site.

3.5 Solar Plant Engineering Components

Utility scale solar projects generally use one of two technologies, PV or CSP. A typical mine site in Lander County receives 6-8 kWh/m^2/day of concentrated solar energy.

3.5.1 PV Components

PV systems convert the energy of the sun directly into electricity without the transfer of heat. PV systems are generally constructed of a fixed panel platform or a single axis tracking system which would follow the sun through the day. A single axis system will generate an additional 30-40% more energy than a fixed frame system. The largest PV system in Nevada is located at the Nellis Air Force Base outside of Las Vegas. This 140 acre facility was constructed in 2007 and is capable of producing 13 MW (see Appendix A).

Solar PV systems are generally composed of:

- PV modules
- Inverters
- Solar racking systems
- Standard electrical hardware components

A typical solar PV module is about 3 feet wide, by 5 feet long, and 2 inches tall including the standard aluminum frame. The average power generated by one PV Module is about 200 watts (or about three standard incandescent light bulbs). By adding modules in series and parallel, system designers can reach voltages and currents appropriate for the size of the installation. It is extremely important to have systems sized appropriately and it is not uncommon for large commercial or utility-scale systems to have a Nevada state-licensed electrical engineer design and stamp the system design.

Inverters vary in size and ability depending upon the application; but all in all their jobs is to convert the direct current electricity generated by PV modules into alternating current compatible with the local electrical grid. Commercial and utility-scale PV systems can be connected into the local power company (such as Wells Rural Electric, NV Energy, or Mt. Wheeler Power) with approval of net metering or power purchase agreements.

For large commercial or utility-scale PV developments, the racking system which hold the PV modules are typically mounted to the ground with concrete columns, strips, or pads depending upon the design requirements of snow loading, earthquake zones, and wind forces. The design of the racking system including tilt angle (from flat horizontal), orientation (North, East, West, etc.) and tracking ability are critical to the performance of a system.

Depending upon the location, size, and finances of a project, the systems may or may not track the sun. There are typically three types of tilting methods as shown in Figure 3.5.

Fixed Tilt | Single Axis Tracking | Double-Axis Tracking

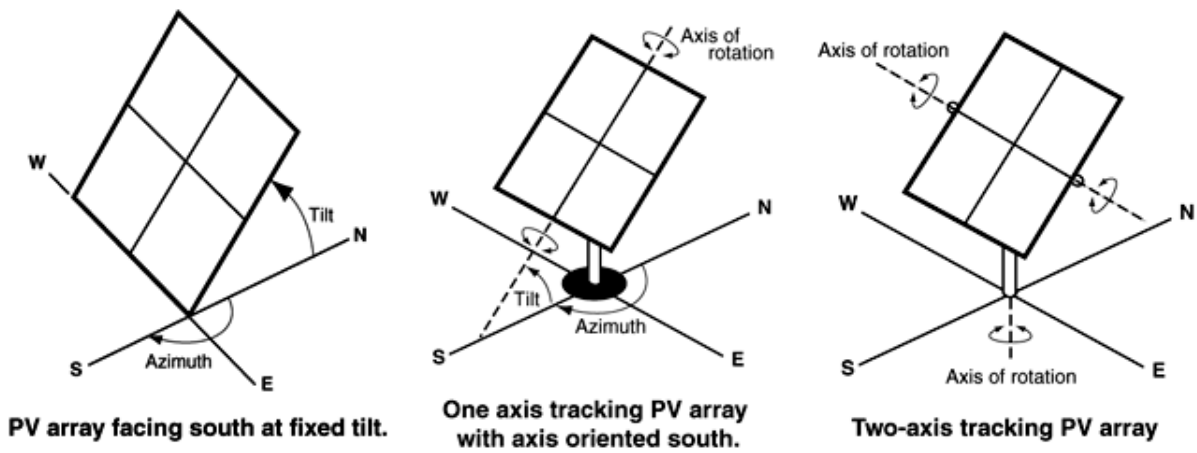


Figure 3.5: PV System Tilting Methods

By choosing the right combination of modules, inverters and racking, a PV system can provide many years of reliable, renewable energy.

3.5.2 CSP Parabolic Trough System Components

CSP systems can be built to sustain a small power system of a few kilowatts or as large as a utility scale system to generate hundreds of megawatts. Due to the costs of the CSP systems, they are generally better suited for the larger scale utility systems. The largest solar project in Nevada, the Solar One Project, uses a trough system of a CSP to generate 64 MW of electricity for Las Vegas.

Linear concentrator systems capture the sun's energy with large mirrors that reflect and focus the sunlight onto a linear receiver tube. The receiver contains a fluid that is heated by the sunlight and then used to create steam that spins a turbine generator to produce electricity. Alternatively, steam can be generated directly in the solar field, eliminating the need for costly heat exchangers. Currently, individual systems can generate about 80 MW of electricity. See Figure 3.6 for an example of a linear concentrator system. Nevada Solar One is a linear concentrator system.

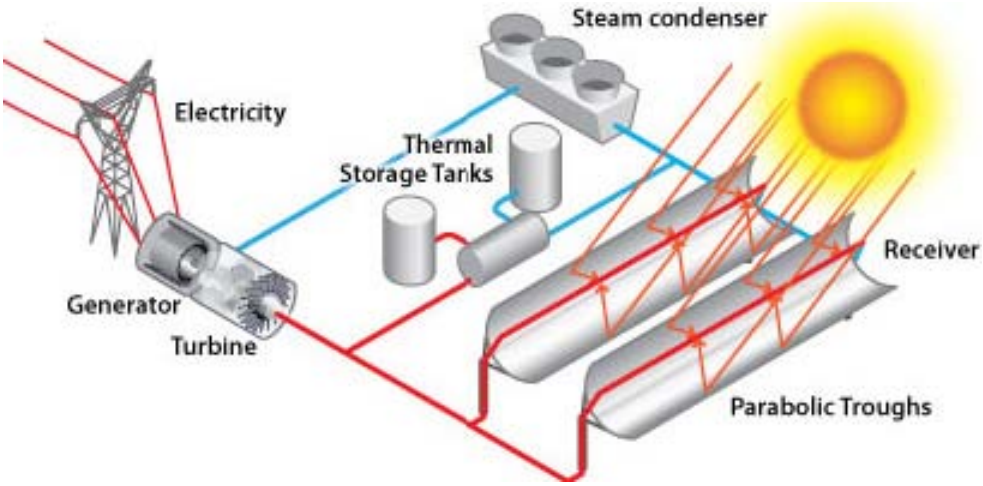


Figure 3.6: Typical Linear Concentrator Solar Energy System

3.5.3 CSP Power Tower System Components

One form of CSP is known as a "power tower" system. Power tower systems consist of numerous large, flat, sun-tracking mirrors known as heliostats which focus sunlight onto a receiver at the top of a tower. The heated fluid in the receiver is used to generate steam, which powers a turbine and a generator to produce electricity. Some power towers use water/steam as the heat-transfer fluid. Individual commercial plants can be sized to produce up to 200 MW of electricity. See Figure 3.7 for a schematic diagram of a typical power tower solar system.

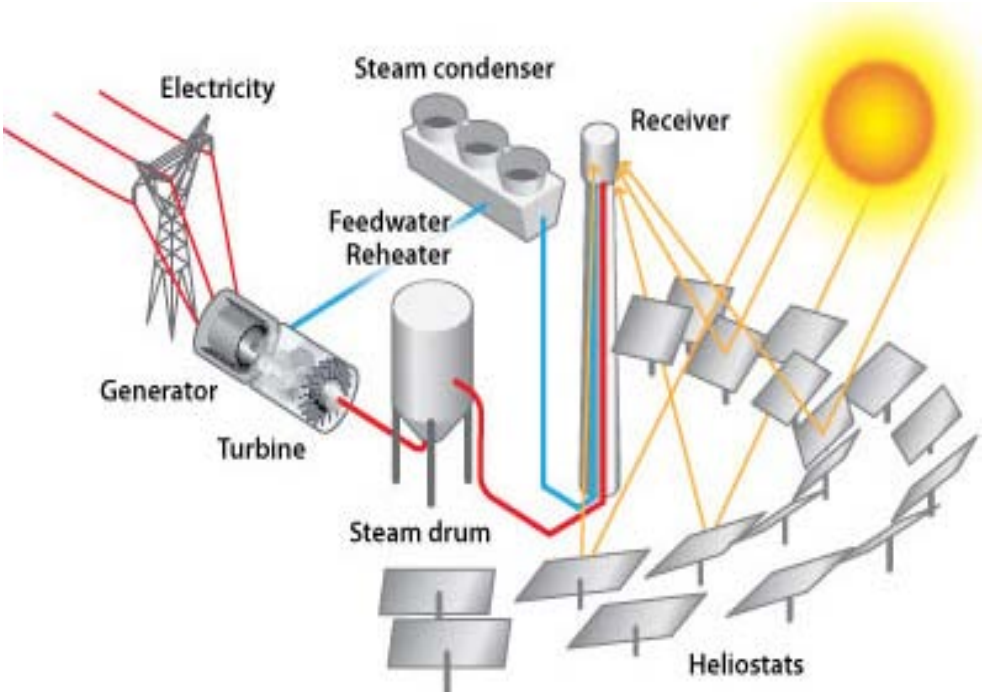


Figure 3.7: Typical Power Tower Solar Energy System

3.6 Solar Plant Development

Development of a solar energy project at a mine site will usually follow a predictable path. Major tasks associated with solar power development are shown below:

1. Evaluate the solar resource and optimal technology for the site
2. Identify transmission interconnection infrastructure (substation location)
3. Identify off-taker/market
4. Do an assessment for environmental, cultural and aviation impacts (power tower)
5. Complete solar resource assessment
6. Initiate or modify permits
7. Construct project

To obtain data suitable for determining the financial feasibility of a solar project, NREL solar data can be utilized for initial studies. These studies need to be followed by on-site pyrometer measurements, preferably taken over one full year.

If the solar data reflects that the mine site is suitable for a solar energy project, the design should be incorporated with the mine infrastructure design. At that time, an engineer should conduct a geotechnical investigation to evaluate the long-term stability of slopes and foundations. Concurrent with the geotechnical study, an engineer should incorporate the solar energy facility into the general arrangement of the mine infrastructure, including:

- Location and quantity of the solar arrays
- The acreage and locations of all facilities and components (including all existing improvements to be utilized in the new project)
- Electrical components, new equipment and existing system upgrades
- Interconnection with the existing power grid

3.6.1 Solar Project Footprint

Figure 3.8 shows a conceptual 10 MW solar project footprint on an existing mine site. The figure shows a layout of PV panels on and adjacent to a south-facing tailings embankment.

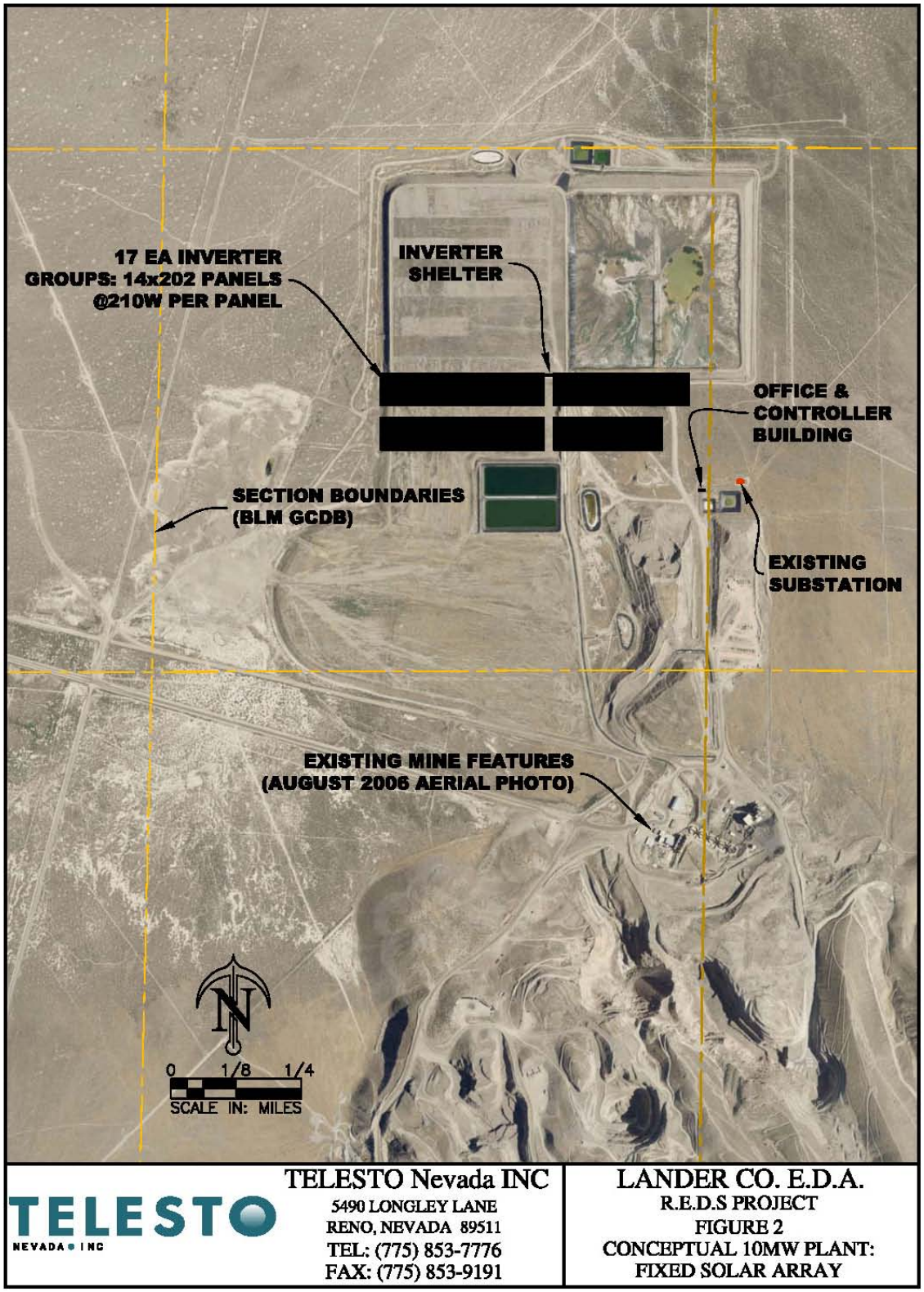


Figure 3.8: Conceptual 10 MW Fixed Solar Array Plant

3.7 Wind Farm Engineering Components

This study focuses on 10 MW installations (four 2.5 MW wind turbines with 100-meter [328-foot] rotors and 80-meter [262-foot] towers) as a baseline. The actual installed capacity depends on power needs, site resource and constraints and the wholesale power market. Specific components of a wind energy project are:

- Wind turbines, foundations, transformers
- Electrical collection system
- Substation
- Access roads
- Meteorological tower(s)
- Maintenance building

3.8 Wind Farm Development

Development of a wind energy project at a mine site will usually follow a predictable path. Major tasks associated with wind power development are shown below:

1. Evaluate the wind resource potential
2. Identify transmission interconnection infrastructure (substation location)
3. Identify off-taker/market
4. Do an assessment for environmental, cultural and aviation impacts
5. Complete wind resource assessment
6. Identify appropriate wind turbines for wind regime and perform design
7. Initiate or modify permits
8. Construct project

To obtain data suitable for determining the financial feasibility of a wind energy project, on-site wind measurements need to be acquired. At least one year of data needs to be collected before deciding if a location has a viable wind resource. After a year-long data collection campaign has been done the data can be evaluated. If the observed data shows sufficient wind speeds, further study is warranted.

The industry standard for data collection is gathered via a 60-meter (197-foot) meteorological tower instrumented with anemometers, wind vanes, temperature and barometric pressure sensors. The erection of a tower will require permission from the BLM (SF-299) for a right of way, a building permit from the county (will require engineering) and a licensed contractor. SODAR (SOnic Detection And Ranging) wind sensors may also be installed to obtain accurate wind data to do the early data analysis. Figure 3.9 shows a typical SODAR station deployed in

the field. Several firms provide a service where on-site data is used in conjunction with historic data and run through a fluid dynamic modeling program.

Figure 3.9: Typical SODAR Station

If the wind data reflects that the mine site is suitable for a feasible wind energy project, the design should be incorporated with the mine infrastructure design. At that time, an engineer should conduct a geotechnical investigation to determine the type of foundation needed to bear the weight of the turbine and to withstand the forces of the wind placed on the tower. Concurrent with the soils report, an engineer should incorporate the wind energy facility into the general arrangement of the mine infrastructure, including:

- Location and quantity of the wind turbines
- The acreage and locations of all facilities and components (including all existing improvements to be utilized in the new project)
- Electrical components, new equipment and existing system upgrades
- Interconnection with the existing power grid

After the wind resource is known, wind turbines suitable for the wind regime need to be identified. Several factors need to be considered in turbine selection. For this document turbine performance alone is considered. Web addresses for several top tier wind turbine manufacturers are shown in Table 3.1.

Table 3.1: Wind Turbine Manufacturers

Company	Website
General Electric	http://www.gepower.com/businesses/ge_wind_energy/en/index.htm
Siemens	http://www.energy.siemens.com/hq/en/power-generation/renewables/wind-power/
Vestas	http://www.vestas.com/
Mitsubishi	http://www.mpshq.com/products/wind_turbines/index.html
Nordex	http://www.nordex-online.com/en/produkte-service/wind-turbines.html

In addition to the above mentioned design items, an environmental assessment will be needed. Much of the work required for a wind energy project is duplicative of what would be required for a mine project. Study results from mine projects may provide ample data for initial environmental and cultural studies. Additional initial studies should include Federal Aviation Administration (FAA) Long Range Radar, Military Operations, NEXRAD and aviation notice criteria (for lighting meteorological towers). Lander County contains a NEXRAD radar on the Shoshone Mesa, a FAA long range radar on Mt Lewis (Air Route Surveillance Radar-2) and multiple military flight paths.

NV Energy possesses multiple high voltage transmission lines that pass through Lander County near Austin, near interstate 80, over the Argenta Rim and south through Crescent Valley to the mine sites there. These paths are convenient to wind development in northern and southern Lander County. Additionally, the substations serving the mines and other infrastructure can be used to tap the existing transmission lines thus lowering the interconnection costs. The RETAAC identified both transmission and renewable energy zones in Nevada. Although these transmission lines and mine infrastructure are present there may be additional design and infrastructure required to connect the wind turbines to the power grid.

3.8.1 Wind Project Footprint

Approximately 10 MW of wind power generating capacity can be placed on a section of land. Wind turbines are usually spaced 3 rotor diameters apart in rows and 10 rotor diameters apart row-to-row. The spacing criteria allow approximately six 1.5-MW turbines on a section of land. Developers usually place the turbines as close together as possible to reduce the costs for wire and roads, but they do not want to create wake losses by placing the turbines too close together. Note that authorization on a wind power site will often allow other uses within the footprint, whereas a solar authorization allows only a single use.

For a conceptual 10 MW project, four 2.5 MW turbines were selected. An engineer would set the locations of the turbines based on accessibility to the existing infastructure, best access to the wind resource, geologic suitability, site elevation, terrain access, land use and environmental impact, and sufficient land area. Using these criteria, a wind turbine project will require about 320 acres of land for development with an actual footprint of approximately 4 acres. Figure 3.10 shows a conceptual footprint for a 10 MW wind power project on a mine site. The site shown is in a valley location and suitable wind speeds would need to be confirmed. A ridge line location might be more efficient at this facility.

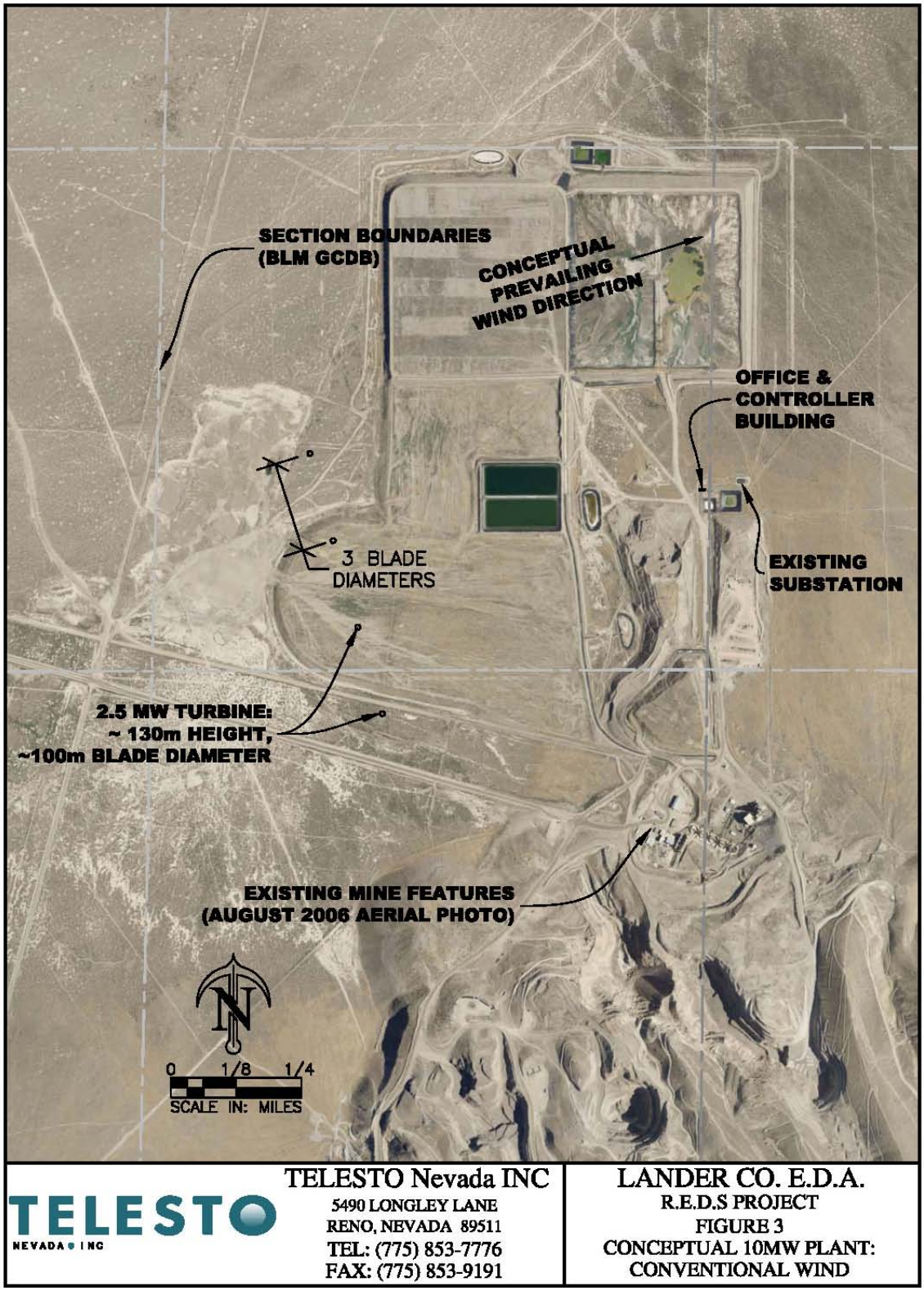
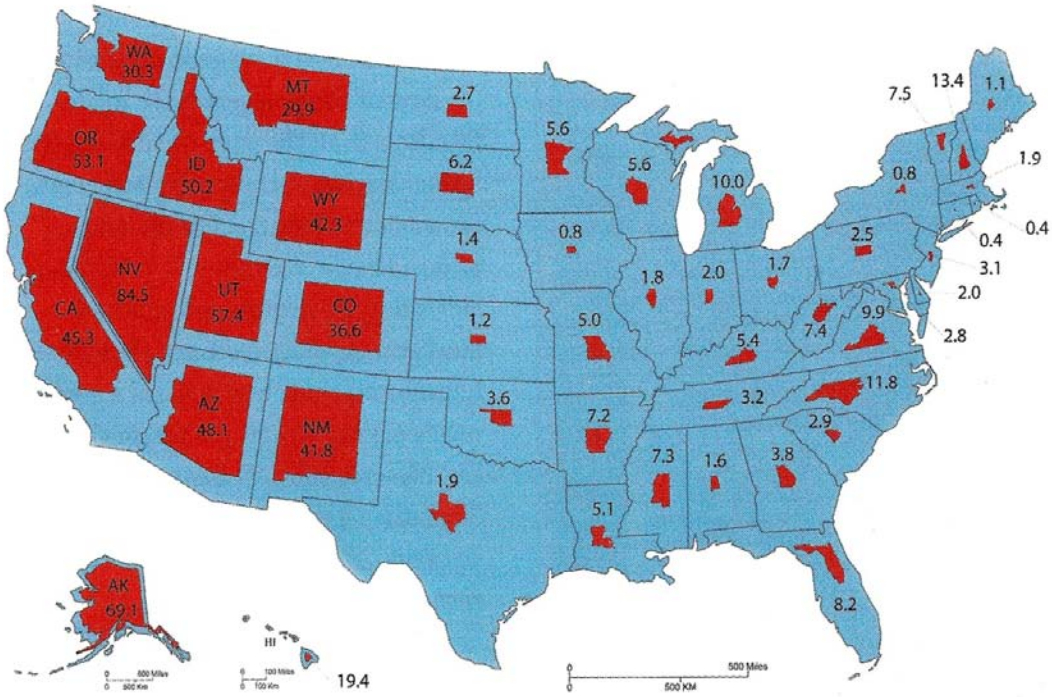


Figure 3.10: Conceptual 10 MW Wind Generating Plant Footprint

4.0 PERMITTING

Over 85% of Lander County (landercountynv.org) and 84.5% of Nevada overall is controlled by the federal government (see Figure 4.1). While this can pose obstacles in permitting, it also has the advantage of dealing with a single entity in most transactions. Much of the private land in Lander County is "checker board" private/public making permitting, access and land control issues for large projects such as wind farms more complex.



Data source: U.S. General Services Administrataion, *Federal Real Property Profile 2004,* excludes trust properties.

Figure 4.1: Federal Land as a Percentage of Total State Land Area

Before mining commences on a property, a mining company must file a Plan of Operations (POO). Every successful POO contains a reclamation plan which addresses the planned future condition of the disturbed area. A renewable energy project can be designed to fit within the planned disturbance of mining activity or it may require additional disturbance to function properly. To ensure compatibility between mining activities and a renewable energy project, early coordination between the operator and BLM is essential to develop a comprehensive plan; this can be accomplished easily with a Voluntary Secondary POO. In Nevada, this also requires coordination and consultation with the Nevada Division of Environmental Protection (NDEP). See Figure 4.2 for a flowchart for permitting a renewable energy project on a mine site.

Third Party developers have the potential to develop Renewable Energy Projects on existing mine sites; however, the mine operator would need to lead the permitting process with BLM and NDEP, then lease the land back to the Third Party developer. On reclaimed mine sites, Third Party developers would need to permit the Renewable Energy Project through the BLM, NDEP and other governing agencies, as if it were a new project.

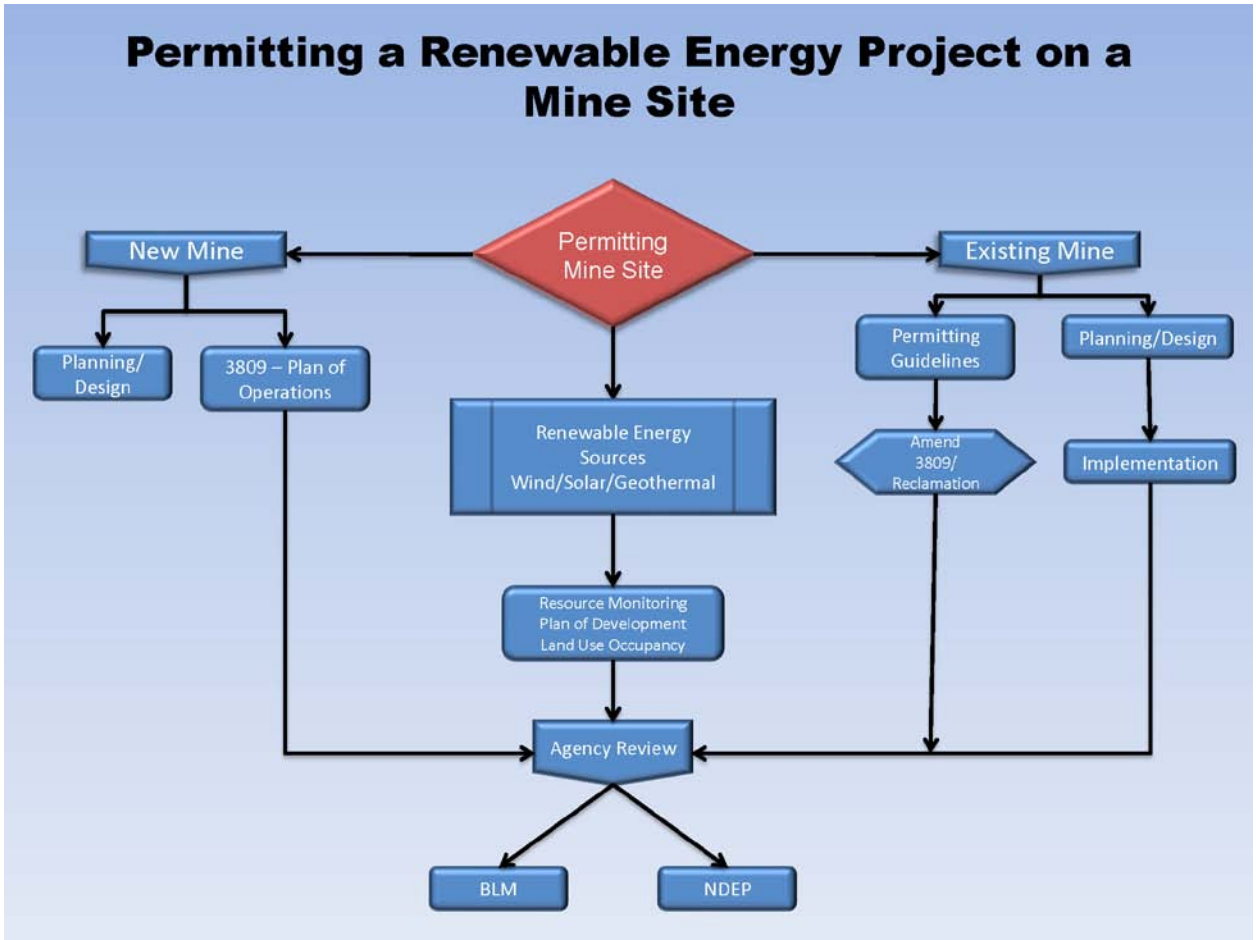


Figure 4.2: Permitting Flowchart for Permitting a Renewable Energy Project on a Mine Site

Reclamation plans serve to guide the operator and the regulatory agencies to the expected reclamation condition of disturbed lands and must be periodically reviewed and modified as necessary. Subsequent proposed renewable energy development and its reclamation will require a review of the previous NEPA analysis to determine whether additional environmental documentation is warranted.

A reclamation plan should provide the following:

- A logical sequence of steps for completing the reclamation process for mining and renewable energy development.
- The specifics of how reclamation standards will be achieved for mining and a discussion of residual reclamation requirements upon completion of mining and continuation of renewable energy development.
- An estimate of specific costs of reclamation for mining and renewable energy activity.
- Information for inspection and enforcement of reclamation and criteria to be used to evaluate reclamation success and reclamation bond release.

- Information to determine if the reclamation plan conforms to the land-use plan.

In preparing and reviewing reclamation plans, the BLM and the operator must set reclamation goals consistent with the land-use plans. The purposes of the reclamation plan are:

- To provide detailed guidelines for the reclamation process and fulfill Federal, State, County and other local agencies requirements.
- To be used by the operator throughout the operational period of the project and subsequent to cessation of mining and renewable energy activities.
- To provide standards to assist in monitoring and compliance.

A reclamation plan should be a comprehensive document submitted with the POO. It is expected that there will be changes to planned reclamation procedures over the life of the project. Therefore, a proposal to include reclamation of a renewable energy project associated with mining should not be seen as unusual.

When reviewing the reclamation plan, the BLM should:

- Immediately upon its receipt, conduct a review to determine whether the reclamation plan is technically and administratively complete.
- Recommend revisions, if necessary, as a result of the on-site review, NEPA, and consultation with appropriate BLM personnel and other SMA's.
- Ensure that the plan conforms to applicable State and Federal requirements.
- Approve or accept the reclamation plan within the appropriate timeframes.
- Set a schedule for inspection of operations and reclamation activities.
- Establish criteria for evaluating the success of reclamation.

4.1 Bonding

The establishment of a bond amount will include a consideration of the costs associated with actual performance of required reclamation, long-term monitoring and treatment, and closure procedures. This bond amount will be adjusted to include the reclamation cost associated with renewable energy development. The BLM has a cooperative agreement with NDEP regarding bonding for mining operations.

The bond amount required to ensure proper reclamation must be determined and the bond in place prior to approval of the exploration or mining plan. If an operator fails to take appropriate action to complete required reclamation or closure work, it may be necessary to call for forfeiture of part or all of the bond. If BLM holds the bond, notices of forfeiture will be sent by the BLM to the party of record and/or operator and to the party that issued the surety or bond. Such notification will be by certified mail, return receipt requested.

In no case will the operator's reclamation bond be released until financial responsibility is established for continued use of the mined lands for renewable energy development.

4.2 Geothermal Permitting

Nevada has attracted significant interest in geothermal exploration and development. The Great Basin region has geologic conditions favorable to creating and capturing geothermal heat. To be in close proximity of favorable geology, several leading geothermal companies have located their operations in Nevada.

Nevada maintains a renewable energy portfolio standard requirement that 25% of all electricity must come from renewable sources by 2025. Nevada provides a positive regulatory environment for developers resulting in timely permitting of geothermal projects by state and federal regulators. The DOE provides significant amounts of funding for advanced geothermal research at the University of Nevada in Reno (the NBMG and the GBCGE). These factors create the positive environment for Nevada's geothermal resource development.

Nevada's geothermal production is increasingly based on lower temperature hot water systems using binary technology, rather than higher temperature steam flash plants. Binary systems involve the movement of significant quantities of geothermal fluids and require large diameter well bores drilled by oil field drill rigs. Well depths may range from as shallow as 500 feet to more than 6,000 feet, and wells may cost $1 to $5 million each, depending on depth. Current activity in Nevada continues to be strong, as measured by permits for power production wells, with 245 permits issued and 126 wells drilled during the period 2007 to 2010.

Nevada law requires that all produced geothermal fluids must be re-injected, requiring an Underground Injection Control permit from the Nevada Division of Environmental Protection. Many geothermal projects involve public land. Federal permits for the wells, plant sites, and transmission corridors are necessary.

The Nevada BLM issued Instruction Memorandum NV-2010-066 on September 3, 2010 to provide guidance to BLM field offices for processing geothermal drilling applications. The following summarizes the BLM procedures and requirements. Several BLM checklists are included in Appendix C. Figure 4.3 is a flowchart of the permitting process for geothermal projects in Nevada.

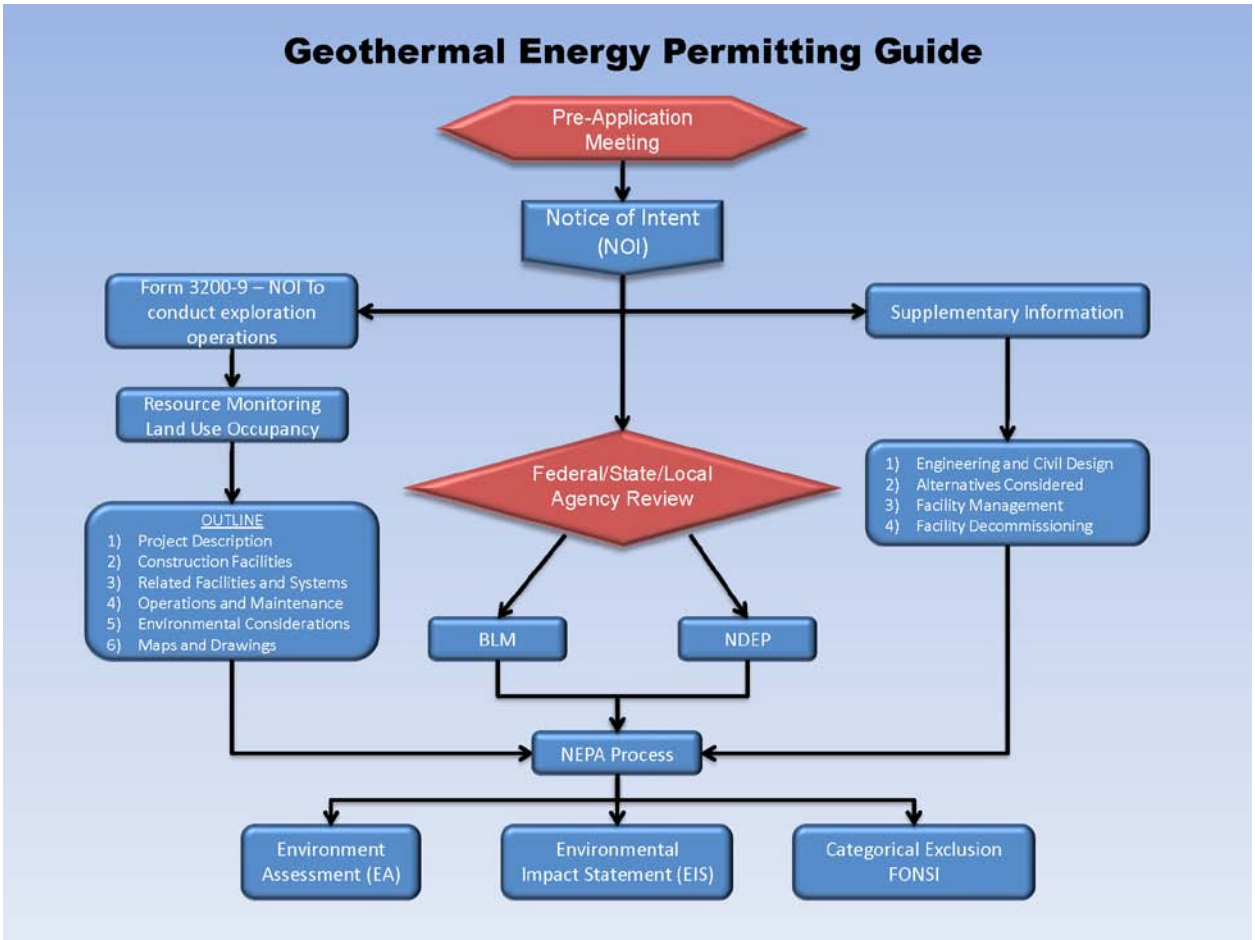


Figure 4.3: Permitting Flowchart for Geothermal Projects

A Pre-Application meeting between the BLM and the geothermal development proponent will be held to discuss the proposed project. Prior to submittal of geothermal drilling permit applications, the applicant will meet with the BLM to discuss the appropriate level of NEPA review required to address environmental issues and identify information needed for environmental analysis. Prior to the meeting with BLM, applicant must submit the following:

- Topographic maps at the appropriate scale outlining the geothermal lease area and proposed project area.
- A topographic map at 1:24,000 scale.
- Shapefiles and metadata associated with map data.
- A general description of the types of activities being proposed.
- The proposed timeline for the projects.
- Description of DOE funding and deadlines.

Much of the above information may be available from the POO for mining and subsequent environmental analysis and documentation.

BLM will provide geothermal permit checklists and templates to industry at the Pre-Application meeting. The following checklists and templates describe BLM's information requirements:

- The Notice of Intent to Conduct Resource Exploration Permits (NOI).
- The Operations Plan (OP).
- The Utilization Plan (UP), Commercial Use Plan (CUP), Construction Permit and Site License.
- Reclamation Plan template.

A project schedule will be developed at the Pre-Application meeting. The established schedule will guide the project and include cooperation time with the DOE for DOE funded projects. Information provided at the Pre-Application meeting will be used by BLM to initiate the Native American Consultation (NAC) process.

Per the BLM – Energy – Rights-of-way – Glossary:

Customer Service Standards: If processing a completed application (in processing categories 1-4) will take longer than 60 calendar days, BLM is required to notify the applicant in writing of this fact prior to the 30th calendar day, and inform the applicant of when they can expect a final decision on the application. BLM will make every effort to process applications for rights-of-way in a timely manner. For category 5 applications, customer service standards are agreed to in the Master Agreement. For category 6 applications, BLM will inform the applicant of the expected processing time within 60 days of receiving the completed application. *(These standards are subject to change)*

Several additional resources exist to answer common questions. The following web links may be of use for a geothermal project:

- www.geo-energy.org
- www.unr.edu/geothermal

Additional geothermal permitting information in relation to mine sites is included in Appendix C.

4.3 Solar Permitting

The following outline identifies the minimum requirements for a solar energy Plan of Development (POD) to be submitted prior to initiation of NEPA analysis (including publication of a Notice of Intent to prepare an EIS) for a solar energy development project. These minimum requirements provide the basic information necessary to begin the NEPA analysis and review process. The specific outline format and title for each section of the POD does not have to be consistent with this template, however, the content of the POD needs to include these minimum requirements.

The Solar Energy POD is a dynamic document that may require additional information during the NEPA review and analysis process. The initial POD template is just that, initial. It may require different information from the applicant depending upon the solar technology, the environmental resources that may be impacted, the location of the proposed project, the timing of the project, etc. There may be information required from one applicant that is not required by another applicant, because of the issues or resources involved.

Due Diligence: The solar energy right-of-way applicant will be requested by letter to provide within 90 days a complete POD consistent with the POD requirements. If the applicant has not responded within 90 days, or if the applicant has responded and the information provided is not sufficient, the BLM will send a second letter of request with a 60-day response. For those applicants that have already provided a POD, but need to submit additional information to meet the requirements of the new POD template, the BLM will send the 60-day letter. A final 30-day show cause letter will be provided to the applicant prior to issuing any decision to reject the application for failure to respond pursuant to the regulations (43 CFR 2804.25(b) and 2804.26(a)(6)). During the NEPA review process additional information may be requested of the applicant. Reasonable periods of time should be provided to the applicant to respond to these requests for additional information.

Supplementary Information: Additional Supplementary Information (attached) will be required, after publication of the NOI, to prepare and complete the NEPA process. Alternative designs and mitigation measures developed in the NEPA analysis will be incorporated into a final POD. Additional environmental information and data (including wildlife surveys, sensitive plants and cultural resource surveys) will be required as part of the NEPA analysis process.

4.3.1 Solar Energy Plan of Development Outline

1) Project Description
   a) Introduction
      i) Describe type of facility, planned uses, generation output
      ii) Applicants schedule for project, including anticipated timelines for permitting, construction and operation, and any phased development as appropriate
   b) Proponents Purpose and Need for the Project
   c) General Facility Description, Design and Operation
      i) Project location, land ownership and jurisdiction
      ii) Legal land description of facility (federal and non-federal lands)
      iii) Total acreage and general dimensions of all facilities and components
      iv) Power plant facilities, thermal conversion process
      v) Numbers and general dimensions of solar array, power generation units (wet or dry cooling), towers, substations, transmission lines, access roads, buildings, parking areas
      vi) Temporary construction workspace, yards, staging areas

vii) Geotechnical studies and data needs, including solar insolation testing
viii) Ancillary facilities (administrative and maintenance facilities and storage sites)
ix) Water usage, amounts, sources (during construction and operations)
x) Erosion control and stormwater drainage
xi) Vegetation treatment and weed management
xii) Waste and hazardous materials management
xiii) Fire protection
xiv) Site security and fencing (during construction and operations)
xv) Electrical components, new equipment and existing system upgrades
xvi) Interconnection to electrical grid
xvii) Spill prevention and containment for construction and operation of facility
xviii) Health and safety program

d) Alternatives Considered by Applicant

i) Alternative project site location considerations
ii) Alternative technology considerations
iii) Alternative project design/layout/phased development considerations
iv) Alternatives considered but not carried forward
v) Comparative analysis of alternatives

e) Other Federal, State and Local Agency Permit Requirements

i) Identify required permits (entire project area on both federal and non-federal lands)
ii) Status of permits

f) Financial and Technical Capability of Applicant

2) Construction of Facilities

a) Solar field design, layout, installation and construction processes including timetable and sequence of construction

b) Phased projects, describe approach to construction and operations

c) Access and transportation system, component delivery, worker access

d) Construction work force numbers, vehicles, equipment, timeframes

e) Site preparation, surveying and staking

f) Site preparation, vegetation removal and treatment

g) Site clearing, grading and excavation

h) Solar array assembly and construction

i) Power plant construction

j) Gravel, aggregate, concrete needs and sources

k) Electrical construction activities

l) Aviation lighting (power towers, transmission)

m) Site stabilization, protection, and reclamation practices

3) Related Facilities and Systems

a) Transmission System Interconnect

i) Existing and proposed transmission system

ii) Ancillary facilities and substations

iii) Status of Power Purchase Agreements

iv) Status of Interconnect Agreement

v) General design and construction standards

b) Gas Supply Systems (as appropriate)

i) Backup natural gas generation requirements

ii) Pipeline routing considerations and construction standards

iii) Metering stations

c) Other Related Systems

i) Communications system requirements (microwave, fiber optics, hard wire, wireless) during construction and operation

4) Operations and Maintenance

a) Operation and facility maintenance needs

b) Maintenance activities, including mirror washing and road maintenance

c) Operations workforce and equipment

5) Environmental Considerations

a) General description of site characteristics and potential environmental issues (existing information)

i) Special or sensitive species and habitats

ii) Special land use designations

iii) Cultural and historic resource sites and values

iv) Native American Tribal concerns

v) Recreation and off-highway vehicle (OHV) conflicts

vi) Other environmental considerations

b) Mitigation measures proposed by applicant and included in POD

6) Maps and Drawings

a) Maps with footprint of solar facility (7.5 min topographic maps or equivalent to include references to Public Land Survey system)

b) Initial design drawings of solar facility layout and installation, thermal power conversion facilities, electrical facilities and ancillary facilities. These initial design drawings will typically be a 30% Engineering and Civil Design package to adequately describe the proposed project and evaluate the design considerations for soils, drainage and watershed management.

c) Initial site grading plan

d) Maps with transmission facilities, substations, distribution, communications

e) Access and transportation maps

4.3.2 Supplementary Information

Additional supplementary information will be required from the applicant in order to prepare the NEPA analysis and complete the review process, but is not required to be submitted with the initial POD. This information may be filed after the publication of a NOI to prepare an EIS, but is required before the BLM can complete the environmental analysis. This information is developed as further data is gathered on-site and as alternative designs and mitigation measures are incorporated into a final POD. Other environmental data and inventory information (including but not limited to cultural resources, sensitive species and other biological data) will also be required to be collected by the applicant in order to prepare the NEPA analysis. Much of this information may be available from the POO for mining and subsequent environmental analysis and documentation.

1) Engineering and Civil Design

   a) Facility survey and design drawing standards

   b) Final engineering and civil design packages for all solar facilities, thermal power conversion facilities, electrical facilities and ancillary facilities that incorporate all mitigation measures developed in the NEPA analysis and incorporated into the final POD

   c) Watershed and drainage analysis and calculations

   d) Watershed protection and erosion control design drawings

   e) Final site grading plans

2) Alternatives Considered by the Applicant

   a) Alternative engineering design considerations

   b) Alternatives considered but not carried forward by proponent

   c) Comparative analysis of design alternatives

3) Facility Management Plans

   a) Stormwater Pollution Prevention and Protection Plan

b) Hazardous Materials Management Plan

c) Waste Management Plan

d) Invasive Species and Noxious Weed Management Plan

e) Health and Safety Plan (meeting OSHA requirements)

f) Environmental Inspection and Compliance Monitoring Plan

4) Facility Decommissioning

a) Reclamation and site stabilization planning

b) Temporary reclamation of disturbed areas

c) Removal of power generation and substation facilities

d) Removal of heliostats/panels

e) Removal of other ancillary facilities

Figure 4.4 shows a flowchart of the steps required for permitting a solar energy project.

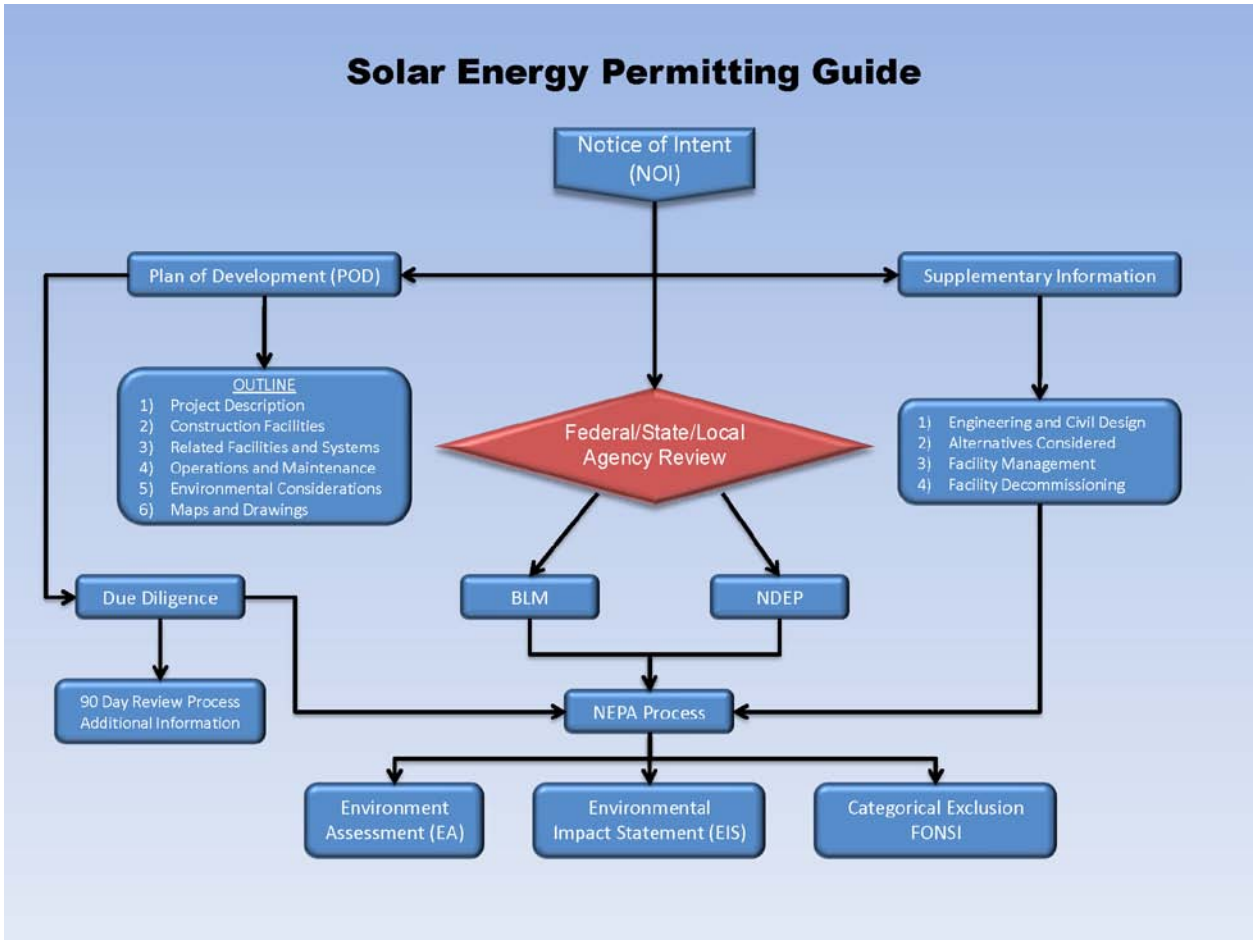


Figure 4.4: Permitting Flowchart for Solar Projects

Several additional resources exist to answer common questions. The following web links may be of use for a solar project:

- www.seia.org
- www.ases.org
- www.nrel.gov
- www.sepa.org

4.4 Wind Permitting

The following outline identifies the minimum requirements for an initial wind energy Plan of Development (POD) to be submitted prior to the end of the 3-year term of a site testing and monitoring authorization. These minimum requirements provide the basic information necessary to begin the National Environmental Policy Act (NEPA) analysis and review process for a wind energy development project. The specific outline format and title for each section of the POD does not have to be consistent with this template; however, the content of the POD needs to include these minimum requirements.

The wind energy POD is a dynamic document that may require additional information during the NEPA review and analysis process. The initial POD template is just that, initial. It may require different information from the applicant depending upon the environmental resources that may be impacted, the location of the proposed project, and the timing of the project. There may be information required from one applicant that is not required by another applicant because of the issues or resources involved.

The BLM has the following Types of permits associated with Wind Projects:

Type I - Site specific testing and monitoring grant encompassing only the location of a meteorological tower (used to do research, but not development). 3 years in duration.

Type II - Project testing and monitoring grant area grant encompassing an entire proposed project area and multiple meteorological tower locations. 3 years in duration.

Type III - Project development and operation grant. Long term.

4.4.1 Wind Energy Plan of Development Outline

1) Project Description
   a) Introduction
      i) Describe type of facility and generation capacity (Federal and non-Federal lands)
      ii) Applicants proposed schedule for project, including anticipated timelines for permitting, construction and operation, and any phased development as appropriate
   b) Proponent's Purpose and Need for the Project

c) General Facility Description, Design, and Operation

i) Project location, land ownership, and jurisdiction
ii) Legal land description of facility (Federal and non-Federal lands)
iii) Total acreage and general dimensions of all facilities and components
iv) Number and size of wind turbines (Federal and non-Federal lands)
v) Wind turbine configuration and layout (Federal and non-Federal land)
vi) Substations, transmission lines, access roads, buildings, parking areas
vii) Ancillary facilities (administrative and maintenance facilities and storage sites)
viii) Temporary construction workspace, yards, staging areas
ix) Water usage, amounts, sources (during construction and operations)
x) Erosion control and stormwater drainage
xi) Vegetation treatment, weed management, and any proposed use of herbicides
xii) Waste and hazardous materials management
xiii) Fire protection
xiv) Site security and fencing proposed (during construction and operations)
xv) Electrical components, new equipment and existing system upgrades
xvi) Interconnection to electrical grid
xvii) Spill prevention and containment for construction and operation of facility
xviii) Health and safety program

d) Alternatives Considered by Applicant

i) Alternative project site location considerations
ii) Alternative technology considerations
iii) Alternative project design/layout/phased development considerations
iv) Alternatives considered but not carried forward
v) Comparative analysis of alternatives

e) Other Federal, State and Local Agency Permit Requirements

i) Identify required permits (entire project area on both Federal and non-Federal lands)

ii) Status of permits

f) Financial and Technical Capability of Applicant

2) Construction of Facilities

a) Wind turbine design, layout, installation, and construction processes including timetable and sequence of construction

b) Geotechnical studies that may be planned

c) Phased projects, describe approach to construction and operations

d) Access and transportation system, component delivery, worker access

e) Construction work force numbers, vehicles, equipment, timeframes

f) Site preparation, surveying, and staking

g) Site preparation, vegetation removal, and treatment

h) Site clearing, grading, and excavation

i) Gravel, aggregate, concrete needs and sources

j) Wind turbine assembly and construction

k) Electrical construction activities

l) Aviation lighting (wind turbines, transmission)

m) Site stabilization, protection, and reclamation practices

3) Related Facilities and Systems

a) Transmission System Interconnect

i) Existing and proposed transmission system

ii) Ancillary facilities and substations

iii) Status of Power Purchase Agreements

iv) Status of Interconnect Agreement

v) General design and construction standards

b) Meteorological Towers

c) Other Related Systems

i) Communications system requirements (microwave, fiber optics, hard wire, wireless) during construction and operation

4) Operations and Maintenance

a) Operation and facility maintenance needs

b) Maintenance activities, including road maintenance

c) Operations workforce, equipment, and ground transportation

5) Environmental Considerations

a) General description of site characteristics and potential environmental issues (existing information)

i) Special or sensitive species and habitats

ii) Special land use designations

iii) Cultural and historic resource sites and values

iv) Native American Tribal concerns

v) Recreation and OHV conflicts

vi) Visual Resource Management (VRM) designations

vii) Aviation and/or military conflicts

viii) Other environmental considerations

b) Design criteria (mitigation measures) proposed by applicant and included in POD

6) Maps and Drawings

a) Maps with footprint of wind facility (7.5 min topographic maps or equivalent to include references to Public Land Survey system)

b) Initial design drawings of wind facility layout and installation, electrical facilities, and ancillary facilities. These initial design drawings will typically be a 30% Engineering and Civil Design package to adequately describe the proposed project and evaluate the design considerations for soils, drainage, and watershed management.

c) Initial site grading plan

d) Maps with transmission facilities, substations, distribution, communications

e) Access and transportation maps

f) Preliminary visual resource evaluation and visual resource simulations

4.4.2 Supplementary Information

Additional supplementary information will be required from the applicant in order to prepare the NEPA analysis and complete the review process but is not required to be submitted with the initial POD. This information is developed as further data is gathered onsite and as alternative designs and mitigation measures are incorporated into a final POD. Other environmental data and inventory information (including but not limited to cultural resources, sensitive species, and other biological data) will also be required to be collected by the applicant in order to prepare the NEPA analysis. Much of this information may be available from the POO for mining and subsequent environmental analysis and documentation. The BLM Battle Mountain District will identify surveys which are required during the pre-kickoff meeting. Conducting the needed surveys prior to the delivery of the POO will reduce the need for plan modifications due to any avoidance areas and will expedite the NEPA process.

1. Engineering and Civil Design

a) Facility survey and design drawing standards

b) Final engineering and civil design packages for all wind energy facilities, electrical facilities, and ancillary facilities that incorporate all mitigation measures developed in the NEPA analysis and incorporated into the final POD

c) Aviation lighting plan

d) Watershed protection and erosion control design drawings

   e) Final site grading plans
   f) Visual resource evaluation, final simulations, and mitigation strategy

2) Alternatives Considered by the Applicant
   a) Alternative engineering design considerations
   b) Alternatives considered but not carried forward by proponent
   c) Comparative analysis of design alternatives

3) Facility Management Plans
   a) Stormwater Pollution Prevention and Protection Plan
   b) Hazardous Materials Management Plan
   c) Waste Management Plan
   d) Invasive Species and Noxious Weed Management Plan
   e) Health and Safety Plan (meeting OSHA requirements)
   f) Environmental Inspection and Compliance Monitoring Plan

4) Facility Decommissioning
   a) Reclamation and site stabilization planning
   b) Temporary reclamation of disturbed areas
   c) Removal of wind turbines and substation facilities
   d) Removal of other ancillary facilities

Figure 4.5 shows a flowchart of the steps required for permitting a wind energy project.

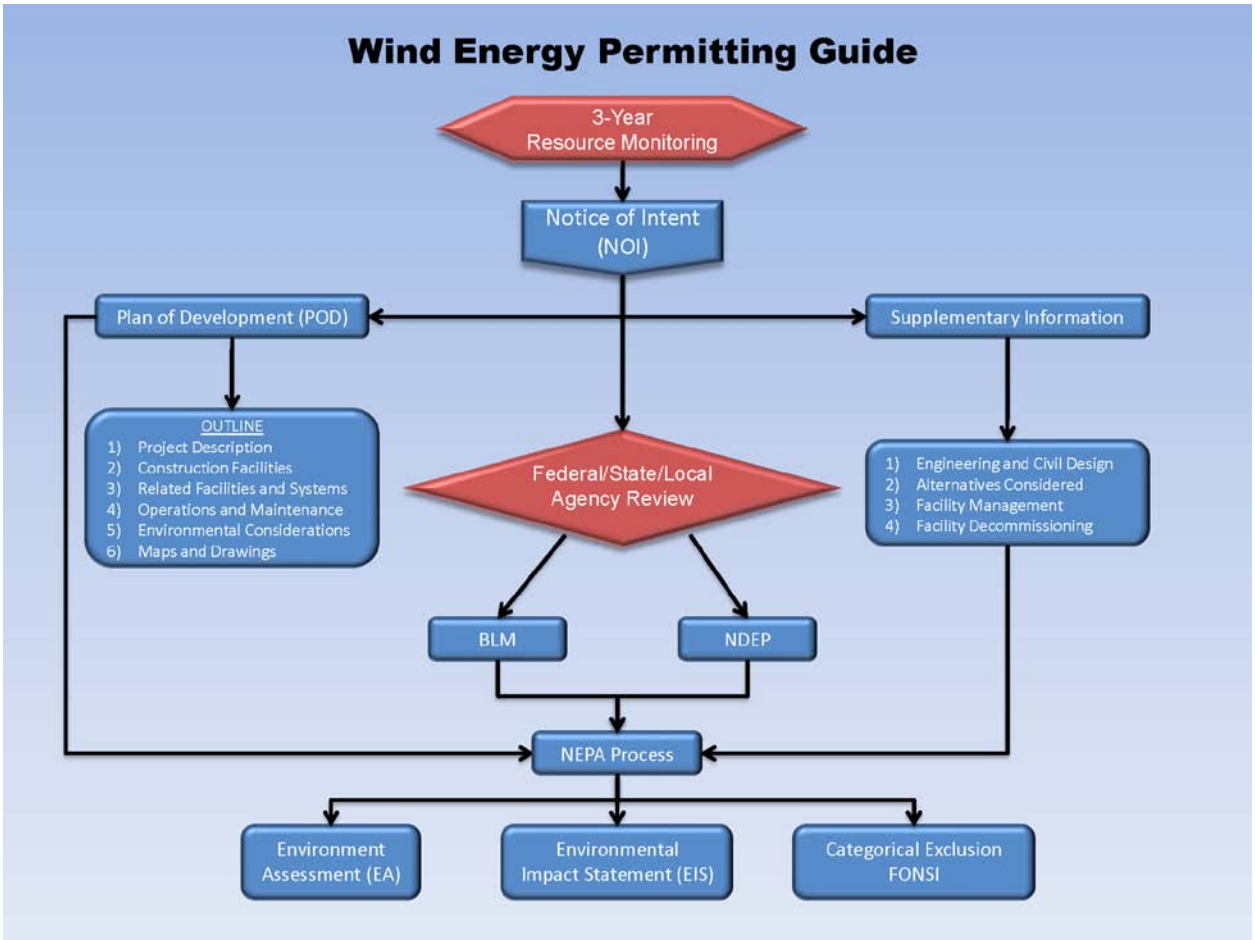


Figure 4.5: Permitting Flowchart for Wind Projects

Environmental review is site specific and beyond the scope of this document. Most if not all potential wind project locations in Lander County will be located entirely or in part on federal land and, therefore be subject to NEPA. Both environmental and cultural issues would be addressed within a NEPA study. Much of the work required for a wind energy project is duplicative of what would be required for a mine project. Additional avian, bat and visual studies may be required. Study results from mine projects may provide ample date for initial environmental and cultural studies. Additional initial studies should include FAA Long Range Radar, Military Operations, NEXRAD (NEXt-generation RADar weather radar) and aviation notice criteria (for lighting meteorological towers).

Table 4.1 has contact information for some of the entities which will likely be involved in the permitting process for any wind projects proposed in Lander County. For additional guidance from the BLM regarding permitting of wind projects, refer to Appendix D.

Table 4.1: Contact Information for Regulatory Entities in Lander County

Lander County Building Department 825 North 2nd Street Battle Mountain, NV 89820-2834 U.S.A. Tel: +1 775.635.2860	Nevada Division of Wildlife, Eastern Region 60 Youth Center Road Elko, NV 89801 U.S.A. Tel: +1 775.777.2300 Fax: +1.775.738.2485
U.S. Fish and Wildlife Service 1340 Financial Blvd., Suite 234 Reno, NV 89502 U.S.A. Tel: +1 775.861.6300	U.S. Bureau of Land Management Battle Mountain District Office 50 Bastian Road Battle Mountain, NV 89820 U.S.A. Tel: +1 775.635.4000 Fax: +1.775.635.4034
Federal Aviation Administration 800 Independence Avenue, SW Washington, DC 20591 866-TELL-FAA (866-835-5322) U.S.A.	U.S. Department of Commerce National Oceanic and Atmospheric Administration National Weather Service 1325 East West Highway Silver Spring, MD 20910 U.S.A.

Several additional resources exist to answer common questions. The following web links may be of use for a wind project:

- www.wrcc.dri.edu
- www.awea.org
- www.nrel.gov
- www.windustry.org

4.4.3 BLM Wind Programmatic Environmental Impact Statement (PEIS)

The BLM has completed a PEIS for wind energy. The document is too large to include within this document. It may be found at: http://windeis.anl.gov/documents/fpeis/index.cfm.

4.4.4 Wind Development BLM Instruction Memorandum

The Wind Development BLM Instruction Memorandum may be found in Appendix E.

4.4.5 BLM Plan of Operations Voluntary Checklist

The BLM Plan of Operations Voluntary Checklist may be found in Appendix F.

Section 9.0 describes Critical Success Factors required for permitting a renewable energy project on an existing or abandoned mine site.

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5.0 COSTS

The Energy Information Association has published comparative costs for power from a variety of sources. Costs have been levelized on an annual basis for comparison between technologies, as shown in Table 5.1. *This table can be utilized to understand general renewable energy costs by comparing the Total System Levelized Costs of renewable power generation to that of traditional power generation, keeping in mind the Capacity Factor, which is the (actual power generated by the plant / potential power of the plant) over time.*

Table 5.1: Estimated Levelized Cost of New Generation Resources, 2016

Plant Type	Capacity Factor (%)	U.S. Average Levelized Costs (2009 $/MWh) for Plants Entering Service in 2016				
		Levelized Capital Cost	Fixed O&M	Variable O&M (including fuel)	Transmission Investment	Total System Levelized Cost
Conventional Coal	85	65.3	3.9	24.3	1.2	94.8
Advanced Coal	85	74.6	7.9	25.7	1.2	109.4
Advanced Coal with CCS	85	92.7	9.2	33.1	1.2	136.2
Natural Gas-fired						
Conventional Combined Cycle	87	17.5	1.9	45.6	1.2	66.1
Advance Combined Cycle	87	17.9	1.9	42.1	1.2	63.1
Advanced CC with CCS	87	34.6	3.9	49.6	1.2	89.3
Conventional Combustion Turbine	30	45.8	3.7	71.5	3.5	124.5
Advanced Combustion Turbine	30	31.6	5.5	62.9	3.5	103.5
Advanced Nuclear	90	90.1	11.1	11.7	1.0	113.9
Wind	34	83.9	9.6	0.0	3.5	97.0
Wind – Offshore	34	209.3	28.1	0.0	5.9	243.2
Solar PV[1]	25	194.6	12.1	0.0	4.0	210.7
Solar Thermal (CSP)	18	259.4	46.6	0.0	5.8	311.8
Geothermal	92	79.3	11.9	9.5	1.0	101.7
Biomass	83	55.3	13.7	42.3	1.3	112.5
Hydro	52	74.5	3.8	6.3	1.9	86.4

[1] Costs are expressed in terms of net AC power available to the grid for the installed capacity
Note: Table 5.1 is adapted from the Energy Information Association, Annual Energy Outlook 2011, December 2010.

For project-specific cost analysis for solar and wind projects, refer to the Jobs and Economic Development Impact (JEDI) models which are available at the NREL website: http://www.nrel.gov/analysis/jedi/about_jedi.html. Additionally, an alternate wind project cost model may be found at: http://www.windustry.org/your-wind-project/community-wind/community-wind-toolbox/chapter-3-project-planning-and-management/wi. Because of the highly variable costs of geothermal exploration and development of geothermal resources, no model is known to be available for estimating costs as of the date of this report. Moore, Post, Hansen and

Mysak found operations and maintenance costs to be 0.12% of initial system installed capital costs (excluding inverter replacement/rebuilding).

5.1 Geothermal Costs

Getting a geothermal project financed even in a good credit market can be difficult. Energy project financing is highly dependent on the power purchase agreements with utilities. But such agreements are much tougher to obtain for geothermal plants because about half the cost of development comes before a site's resource is fully understood.

Geothermal power requires no fuel, and is therefore immune to fuel cost fluctuations, but capital costs tend to be high. Drilling accounts for over half the costs, and exploration of deeper resources may entail significant risks. A typical well in Nevada can support 4.5 MW of electricity generation and costs about $1-3 million to drill. In total, electrical plant construction and well drilling cost about $3 and $5 million per MW of electrical capacity, but these installed costs are steadily declining with new advances in power plant technology and well-drilling techniques.

5.1.1 10 MW Geothermal Project Description

Binary modules will be sized and designed to fit a specific resource, but one of the newest binary power plants installed in the Western United States is the 10 MW plant at Raft River, Idaho as described in an earlier section of this report. The plant consists of two 5 MW Ormat units that provide an excellent example for this study.

Geothermal systems typically have capital costs between $3 and $5 million per megawatt. A conceptual 10 MW geothermal facility is based on the following:

- Two 5 MW binary modules, 95% CF = 83,220 MWh/yr
- 10 MW cost per MW ~ $3,500,000/MW including well field, transmission, etc.

Because of economies-of-scale savings, operating and maintenance costs for larger geothermal plants are lower on a per megawatt basis, as shown in Table 5.2.

Table 5.2: Geothermal Operating and Maintenance Costs by Plant Size (U.S. cents/kWh)

Component	Small plants (<5 MW)	Medium plants (5-30 MW)	Large plants (>30 MW)
Steam field	0.35–0.7	0.25–0.35	0.15–0.25
Power plants	0.45–0.7	0.35–0.45	0.25–0.45
Total	0.8–1.4	0.6–0.8	0.4–0.7

5.2 Solar Costs

5.2.1 Construction Cost Estimate

Solar PV panel installation costs are estimated at $4 million per megawatt. Costs for a conceptual 10 MW solar facility are given in Table 5.3.

Table 5.3: 10 MW Modular Monocrystalline Solar (Fixed) Facility

Major Components	Number	Unit Cost	Total
Kyocera KD225GX-LPB panels	48,076	$ 555	$ 26,682,180
SMA SC500U	17	$ 140,000	$ 2,380,000
		$	$ -
		$	$ -
Inertie Agreement Contract	1	$ 200,000	$ 200,000
		Major Equipment Subtotal:	$ 29,262,180
Dependent Costs		**Ratio**	**Total**
Fixed ground-mount system		6%	$ 1,755,731
DC wiring, conduit, trenching		5%	$ 1,463,109
AC wiring, conduit, trenching		3%	$ 877,865
			$ -
		Overall System Subtotal:	$ 33,358,885
Contractor's overhead		10%	$ 3,335,889
Engineering & permitting		2.5%	$ 833,972
Installation		10%	$ 3,335,889
		Design & Construction Subtotal	$ 7,505,749
		Total System Cost Estimate	**$ 40,864,634**

5.3 Wind Costs

In the DOE 2009 Wind Technologies Market Report installed cost of wind energy is addressed as;

"The Installed Cost of Wind Power Projects Continued to Rise in 2009, but Reductions May Be on the Horizon. *Among a large sample of wind power projects installed in 2009, reported installed costs had a capacity-weighted average of $2,120/kilowatt (kW). This average increased by $170/kW (9%) from the weighted-average cost of $1,950/kW for projects installed in 2008, and increased by $820/kW (63%) from the average cost of projects installed from 2001 through 2004. Installed costs may – on average – remain high for a period of time as developers continue to work their way through the dwindling backlog of turbines purchased in early 2008 at peak prices. There are expectations, however, that average costs will decline over time as the cost pressures (e.g., rising materials costs, the weak dollar, turbine and component shortages) that have challenged the industry in recent years ease. Differences in average installed costs among regions and by project size are also apparent in the data"*

Wiser and Bolinger, Lawrence Berkeley National Laboratory

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6.0 SUITABILITY AND FEASIBILITY

6.1 Suitability for Renewable Energy Projects

Mine sites appear to be most suitable and adaptable for development of solar energy because the energy source is relatively constant across the county. The development of wind energy is less universal because average wind speeds are variable and may have aviation constraints. Most mine facilities are located in valleys which may be a limiting factor due to insufficient average wind speeds. Geothermal energy developments on mine sites appear to have limited application with present technology in Lander County due to the few geothermal occurrences within known mining districts.

6.2 Suitability for Geothermal Projects

Unlike wind or solar where the energy source can be measured, quantified, and predicted quite easily, the energy source for geothermal is always risky and carries many unknown factors. Although most geothermal resources have been proven to be very reliable producers over the years, the cost and time needed to define and develop a resource are very high. It is the unknown factors associated with the subsurface geothermal resource that makes it difficult to compare to wind and solar. The surface facilities – the power plant, pipelines, power lines, etc. – are easily compared to the surface facilities needed for wind and solar. The geothermal energy source, regardless of how well it has been studied, will always carry unknown factors over time.

Exploration methods to identify a resource target and to select drilling sites are fairly standard and successful. The drilling of production and injection wells, however, carries significant risk and costs for drilling wells can be extremely variable. There are no guarantees that any single well will be successful. If a “dry hole” is drilled, another well will have to be drilled to offset it. Depending on factors such as well depth, rig availability, location, etc., well costs may range from a low of $1 million dollars to more than $5 million dollars. Once a well has been drilled, it cannot be declared successful until it has been tested for at least 30 days to measure temperature, flow rate, and drawdown. A geothermal resource should not be declared successful or economically viable until at least three successful wells have been drilled and tested.

The geothermal potential in mining districts, or near abandoned or producing mines, is relatively small. A few potential areas can be identified, but additional work is needed to define a viable resource. Areas of potential where a geothermal resource is adjacent to, or within a mining district, include the following (from north to south):

Beowawe (T31N, R47E): This area lies on the eastern side of the Argenta metallic mining district and west of the Beowawe district in Eureka County. The Beowawe geothermal resource is along a fault trend that extends westward into Lander County. Federal geothermal leases were issued in 2007 and 2008, and two new leases were issued in 2010.

Lewis (T30N, R45E): A federal geothermal lease was issued in May 2010 to Barrick Cortez, Inc. that covers the northwestern part of the Lewis Mining District and the Betty O'Neal Mine. It is unknown if Barrick has identified a geothermal resource at this location.

McCoy (T29N, R42E): A federal geothermal lease was issued in May 2010 to Earth Power Resources, Inc. This lease is on the west side of the McCoy Mining District and approximate four miles from the McCoy Mine. If a geothermal resource is found in this area, the proximity to the McCoy Mine may make it a feasible option in the future.

Hilltop (T27N, R47E): A non-competitive federal geothermal lease was issued to Cortez Joint Venture in August 2002. The lease is located at the southeast edge of the Hilltop Mining District at the Cortez (Gold Acres area) Mine. It is unknown if Barrick has a viable geothermal resource at the mine.

Warm Springs (T27N, R43E): A federal geothermal lease was issued in June 2010 to Mustang Geothermal Corp. at the Warm Springs Mining District. This is a small mining area where mercury was mined. It is not known if Mustang Geothermal has conducted any exploration operations at the site.

Steiner Canyon (T24N, R43E): Sierra Geothermal Power was the winning bidder at the federal geothermal lease sale held in May 2010. The lease covers the southern tip of the Steiner Canyon Mining District. Earlier leases were issued in the area in 2006 and some geothermal exploration was done in 2006 and 2007. In 2007, a test well was drilled to 3,930 feet and it had a maximum temperature of 125°C (257°F) at the bottom of the well. Thermal gradients decreased with depth and the temperature profile suggested that the well intersected a hot-water outflow zone in shallow volcanic formations. The maximum temperature is marginal for power generation.

Spencer Hot Springs (T17N, R45E; T17N, R45½E): Federal geothermal leases were issued in June 2006. The leases cover Spencer Hot Springs, which at the western margin of the Spencer Hot Springs Mining District. Some exploration work has been done, but a viable geothermal resource has not been identified. The hot springs are approximately one mile from the historic Conquest and Linka mines.

Each geothermal resource is unique with its own characteristics of fluid temperature and chemistry, reservoir permeability, flow rates, and sustainable production. Although power plant and surface infrastructure costs are relatively easy to determine, the cost of developing the well field can be extremely variable. The unknown resource factors therefore make it difficult to compare a geothermal project directly with solar and wind projects.

A geothermal resource may or may not be located suitably close to a mine in Lander County to allow feasible co-development. If a suitable resource is discovered close to a mine site, then a geothermal project could be feasible. Due to the relatively high capital cost of developing the geothermal resource compared with the cost of connection to the energy grid, there will be a lesser advantage for development of geothermal energy on a mine site than wind or solar.

Each resource must be studied on a case-by-case basis to determine if a nearby mine site could be used.

6.3 Suitability for Solar Projects

Most mine sites are probably suitable for development of solar energy during or post mining. The type of solar development will be dependent on the footprint of the ore body and layout of the processing facilities; however most mine sites have ample areas available for photovoltaic panels and concentrating solar power installations. New mines can alter the shape of mine pits, waste rock disposal facilities, heap leach pads, and tailings embankments to maximize the south-facing slope opportunities for solar development. Pit lakes may also become useful for cooling water or for pumped storage reservoirs for hybrid systems.

6.4 Suitability for Wind Projects

Lander County has marginal opportunities for wind energy due to low average wind speeds and over 70 percent of the county is blanketed with military and aviation restrictions potentially limiting the height of turbines.

Lander County contains a NEXRAD on the Shoshone Mesa, a FAA long range radar on Mt. Lewis (Air Route Surveillance Radar-2) and multiple military flight paths. Utilizing this information, a preliminary assessment of the suitability for wind projects in north, middle and south Lander County was performed as a part of this report. The investigation considered wind resource, land status, transmission availability and radar and aviation constraints.

Several constraints need to be considered when developing wind energy projects. These include aviation constraints such as radar, military flight paths and obstruction lighting; weather radar and telecommunications interference, environmental impacts and visual resources. We have primarily focused on aviation and radar impacts. Environmental and telecommunications impacts are highly site-specific and beyond the scope of this report.

This analysis was performed using tools available through the FAA. A map of military flight paths and possible restrictions is included (see Figure 6.1). Apart from the notice criteria tool for meteorological towers, all wind energy projects will require scoping with the FAA, the military and NOAA. Wind energy projects are studied on a case by case basis. The information within this document is for preliminary information gathering purpose only. The radar maps are based on a red, yellow, green approach with only red and green areas listed on maps. The military flight operations map of the entire state of Nevada is also based on the red, yellow, green premise.

See Figures 6.2 through 6.11 for maps the northern Lander County/Shoshone Mesa area. This area best fits the 10 megawatt model allowing for projects to be located on either private or public land; additionally the area is close to transmission infrastructure and is flat offering lower construction costs.

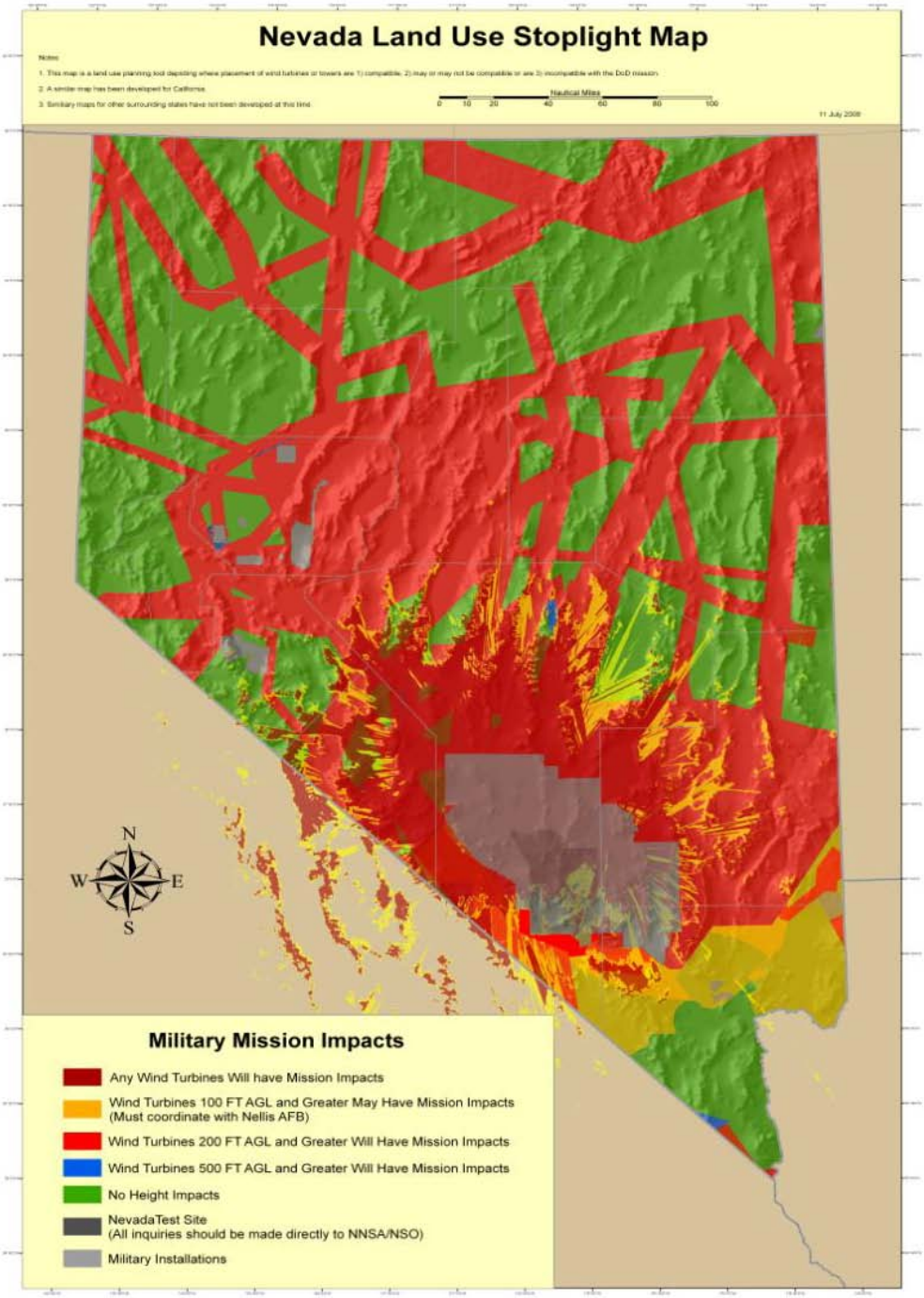

Figure 6.1: Map of Impacts of Wind Turbines on Military Missions in Nevada

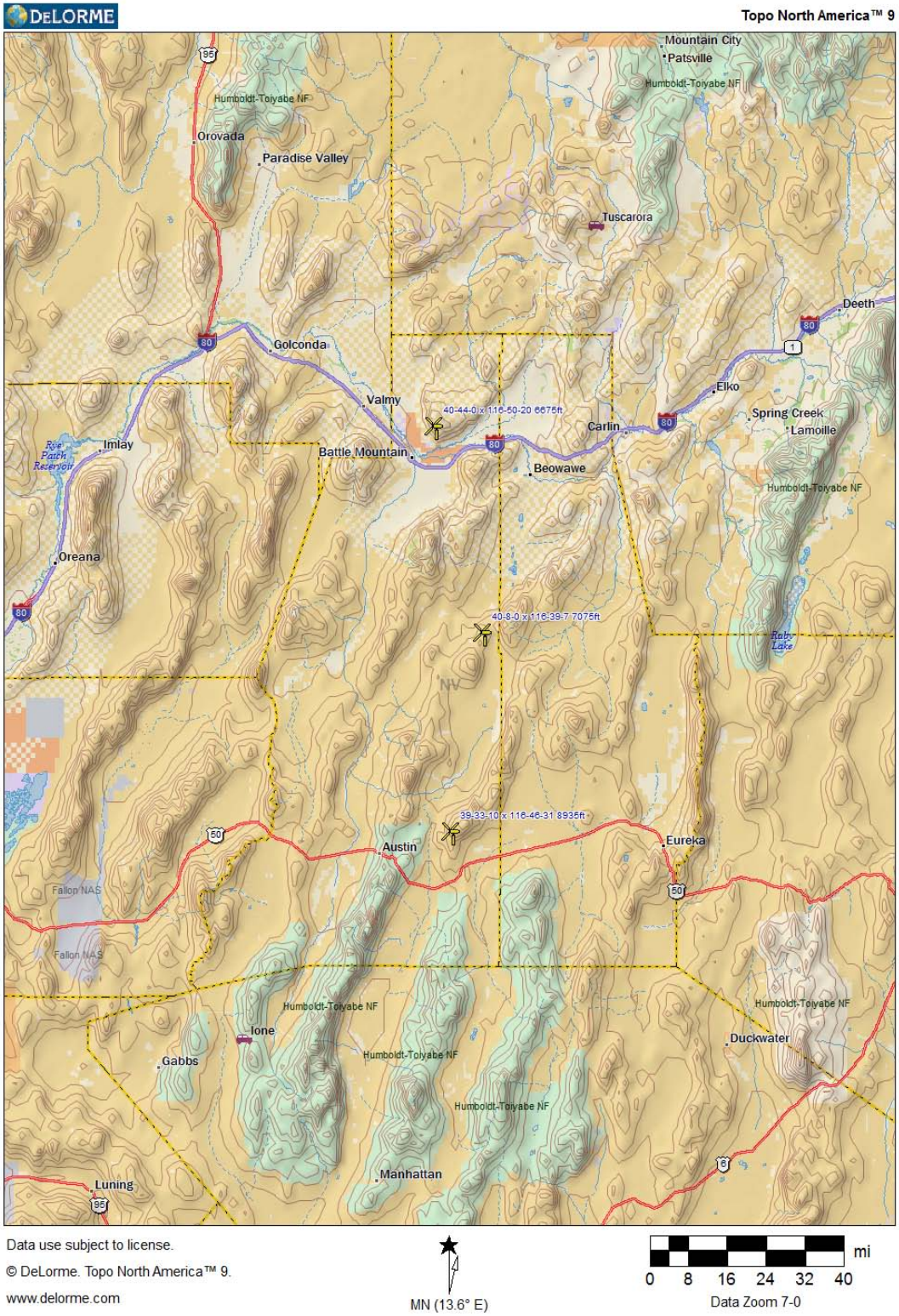

Figure 6.2: Locations Studied for Suitability for Wind Energy Production

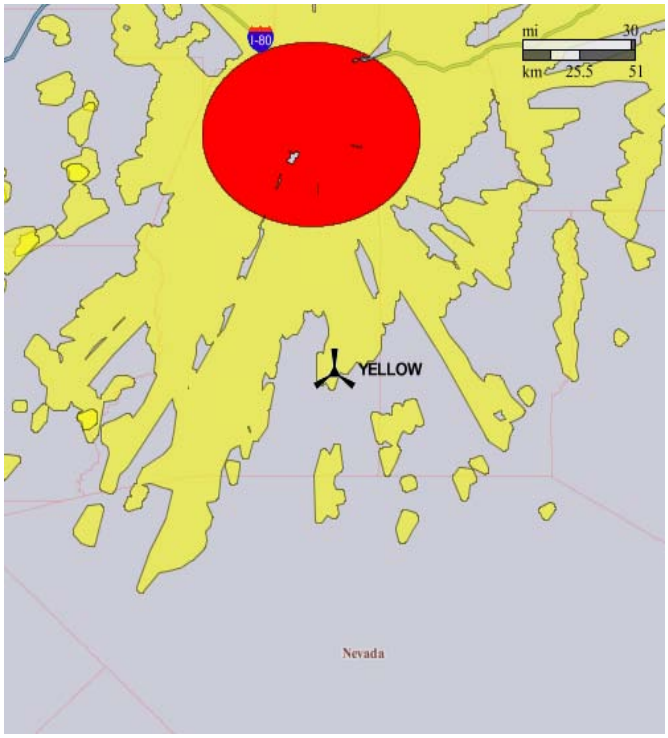

Figure 6.3: Long Range Radar and the Southern Site (39-33-10 x 116-46-31 8935 ft)

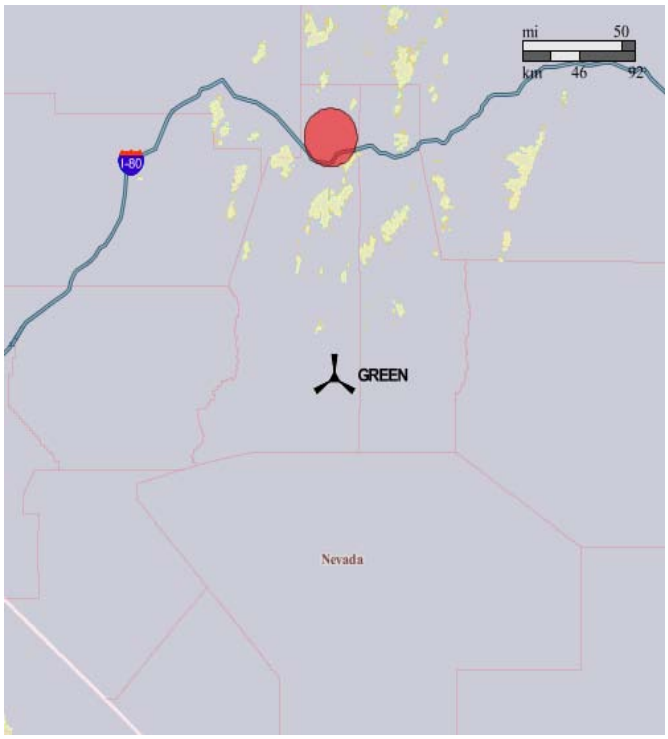

Figure 6.4: NEXRAD and the Southern Site

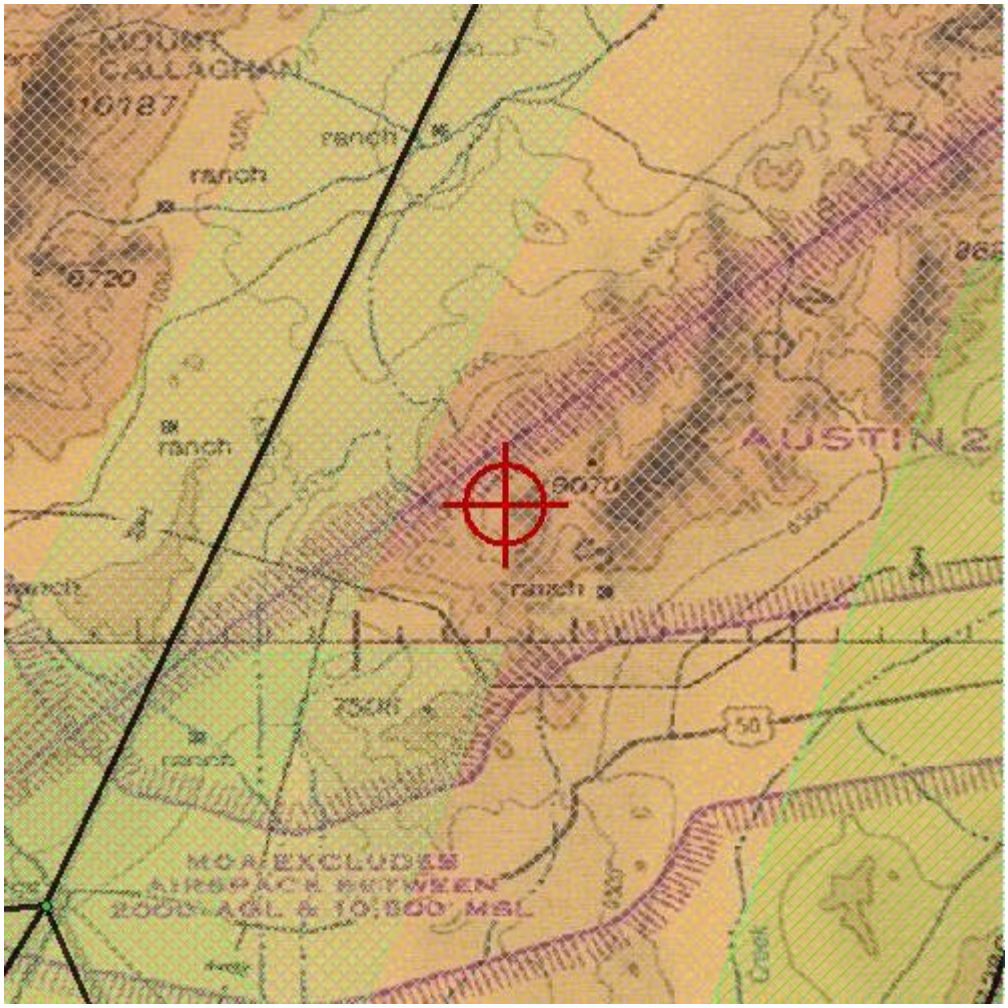

Figure 6.5: Military Operations and the Southern Site

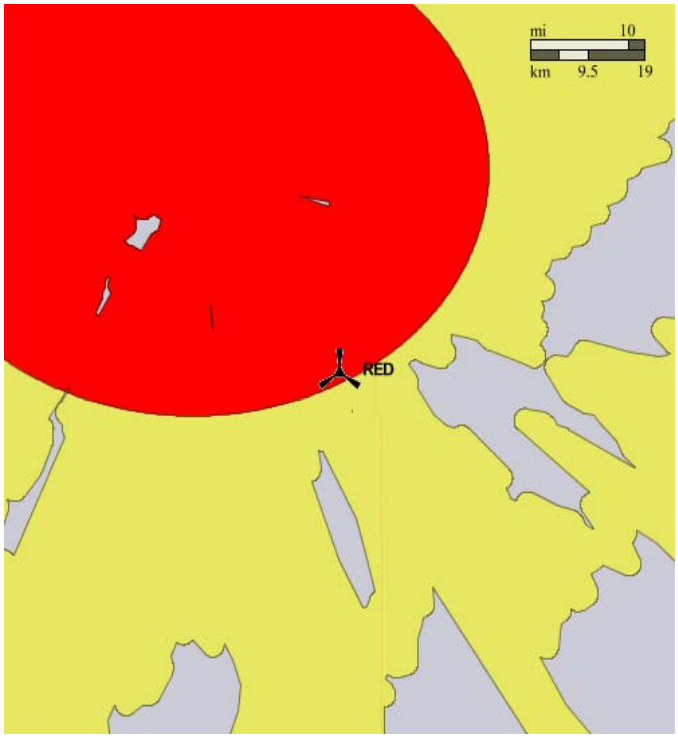

Figure 6.6: Long Range Radar and the Middle Site (40-8-0 x 116-39-70 7075 ft)

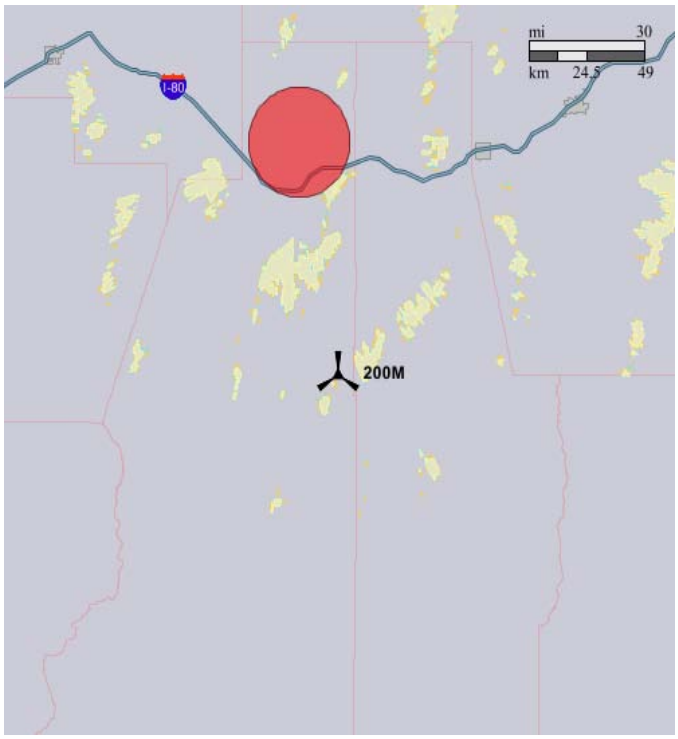

Figure 6.7: NEXRAD and the Middle Site

Military Operations

Figure 6.8: Military Operations and the Middle Site

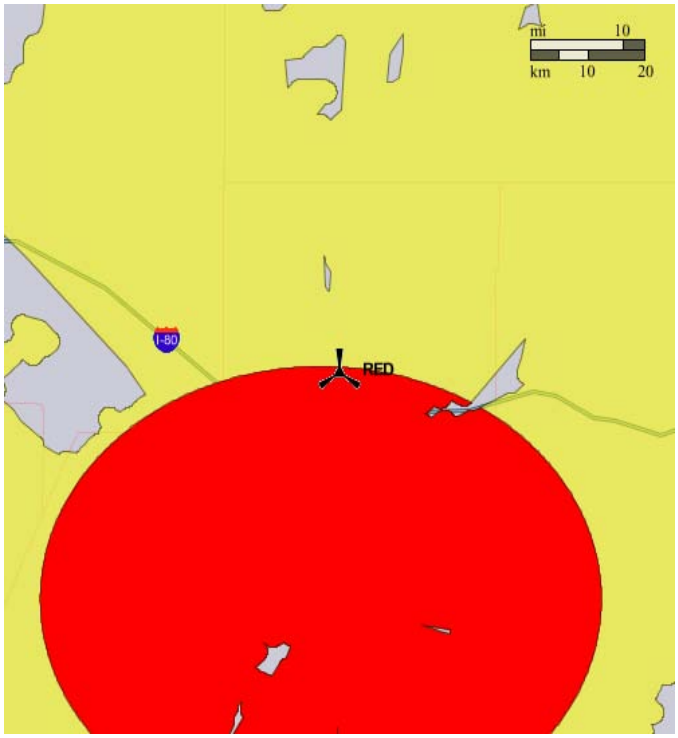

Figure 6.9: Long Range Radar and the Northern Site (40-44-0 x 116-50-20 6675 ft)

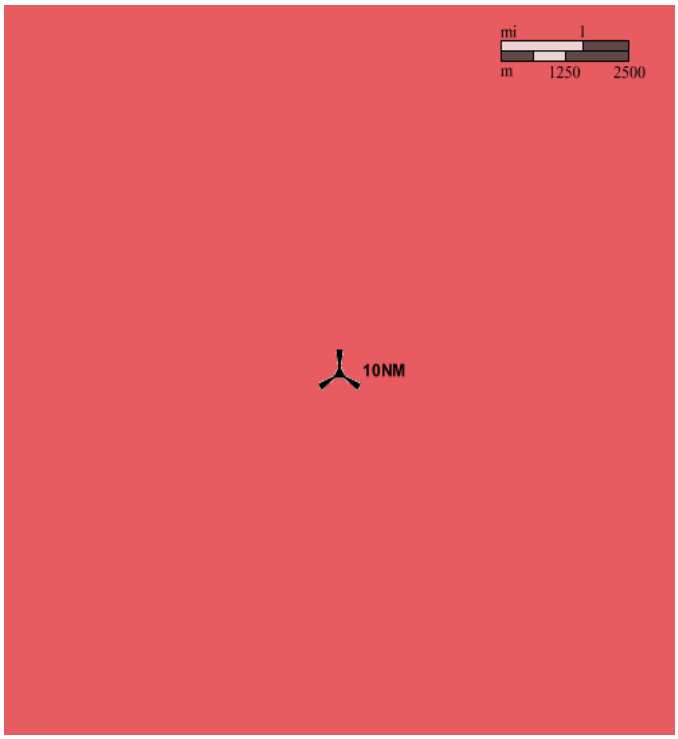

Figure 6.10: NEXRAD and the Northern Site

Figure 6.11: Military Operations and the Northern Site

6.4.1 Wind Study Results

According to the FAA online notice tool, the above listed location requires no notice to erect meteorological towers. However, it is strongly recommend that any meteorological tower installation: A) be examined for FAA notice/marking/lighting requirements; B) the military be consulted; C) towers be painted orange and white; and D) lighting be considered even if not required.

The study shows that Northern Lander County has opportunities to develop wind energy projects in several locations, specifically; there is potential for sub-75 MW projects located on private land. According to DOE wind maps, the wind resource on the Argenta Rim holds promise for wind energy development. This land also contains transmission lines and private land (which may be less costly to permit and construct than federally owned land). Additionally, state level UEPA permitting is not required for projects smaller than 75 MW. Thus, developing modestly scaled wind energy projects may avoid costly permitting layers and provide power to mining operations or for sale.

Using the NREL JEDI model, a single 10 MW wind energy project could produce 70 construction jobs and up to 3 long term jobs. These numbers would grow with an increase in

project size. Many of the skill sets required for wind project construction are not unique. Additionally, the mining work force possesses the same skills. Thus, the need for contractors from outside the area will be minimal. Local contractors, not needing to pay for lodging and per diem, may have an advantage over non-local contractors. This may further boost the local economy.

Using private land to construct the wind projects will also positively impact the local economy by providing lease payments to land owners. Additionally, wind energy projects do not impede most other uses of the land. The primary additional land use that wind energy is complementary to is grazing. The roads footprint of a wind energy project is no more than 3%. Roads which are needed for turbine access provide access for ranching activities and fire suppression.

A 10 MW wind project with an assumed 33% capacity factor produces 28,908 MWh a year. A single 1,350 kW shovel can require over 9,855 MWh/yr to operate. Thus, a 10 MW wind project can produce enough electricity to power three shovels.

6.5 Feasibility

Positive feasibility implies that a capital expenditure will result in revenues or savings that will recover the amount of the money invested plus a percentage (rate of return). In the case of a renewable energy investment on a mine property, a feasibility evaluation must take into account the following factors:

- Investment reimbursements and tax credits
- Possible reductions to reclamation bond costs
- Enhanced public support of project
- Lower power costs during operation
- Preservation of infrastructure following mining making additional mining more economic in the future.
- Post mining revenue stream with built-in inflation protection

The evaluation of the feasibility of a particular renewable energy investment on a mine site will be unique. The evaluation will probably involve more than net present value and rate-of-return calculations, because many of the factors listed above will be difficult to address in purely numerical terms. The benefits of a “green” investment to one mine owner will not be viewed the same to another owner or investor. Mining companies have different investors and investment bankers than alternative energy companies that are supported by “green” investors. Therefore, a generic method of evaluation of the feasibility at a particular site is not possible. However, to provide some guidance for the three types of renewable energy projects discussed in this study, the following bare (non-factored) economic evaluations are presented for comparative purposes.

7.0 RENEWABLE ENERGY SYSTEMS INCENTIVES

The incentives found in this section may or may not be available at any given time because of changes in laws and regulations regarding the incentives. To ensure availability and eligibility, renewable energy proponents are encouraged to contact the appropriate agencies or utilities directly. Contact information is included for many of the programs below. Also note that other incentives may be enacted in the future.

7.1 Nevada's Renewable Portfolio Standard

Nevada established a Renewable Portfolio Standard in 1997. Details of the standard are found in Table 7.1 with additional details below the table.

Table 7.1: Renewable Portfolio Standard Details

State:	Nevada
Incentive Type:	Renewables Portfolio Standard
Eligible Efficiency Technologies	Unspecified Technologies
Eligible Renewable/Other Technologies	Solar Water Heat Solar Space Heat Solar Thermal Electric Solar Thermal Process Heat Photovoltaics Landfill Gas Wind Biomass Hydroelectric Geothermal Electric Municipal Solid Waste Waste Tires (using microwave reduction) Energy Recovery Processes Solar Pool Heating Anaerobic Digestion Biodiesel Geothermal Direct-Use
Applicable Sectors:	Investor-Owned Utility Retail Supplier
Nevada Standard:	**25% by 2025**
Technology Minimum:	Solar: 5% of annual requirement through 2015 (1.2% of sales in 2015); 6% for 2016-2025 (1.5% of sales in 2025)
Credit Trading:	Yes (NVTREC)
Website:	http://pucweb1.state.nv.us/PUCN/RenewableEnergy.aspx
Authority 1: Date Enacted: Authority 2: Date Effective: Authority 3: Date Effective: Authority 4: Date Enacted: Date Effective:	NRS § 704.7801 et seq. 1997 NAC 704.8831 et seq. 2002 LCB File R167-05 (Revised Regulations) 2/23/2006 Assembly Bill 150 5/18/2011 10/1/2011

Summary:

Nevada established a Renewable Portfolio Standard (RPS) as part of its 1997 restructuring legislation. Under the standard, NV Energy (formerly Nevada Power and Sierra Pacific Power) must use eligible renewable energy resources to supply a minimum percentage of the total electricity it sells. In 2001, the state increased the minimum requirement by 2% every two years, culminating in a 15% requirement by 2013. The portfolio requirement has been subsequently revised, most significantly by SB 358 of 2009, which increased the requirement to 25% by 2025. The 2009 amendments also raised the solar carve-out, requiring utilities to meet 6% of their portfolio requirement through solar energy beginning in calendar year 2016. The solar carve-out remains at 5% through the end of calendar year 2015.

AB 3 of 2005 allowed efficiency measures to be used to satisfy a portion of the requirement. To qualify as portfolio energy credits, efficiency measures must be: (1) implemented after January 1, 2005; (2) sited or implemented at a retail customer's location; and (3) partially or fully subsidized by the electric utility. The measure must also reduce the customer's energy demand (as opposed to shifting demand to off-peak hours). The contribution from energy efficiency measures to meet the portfolio standard is capped at one-quarter of the total standard in any particular year. AB1 of 2007 expanded the definition of efficiency resources to include district heating systems powered by geothermal hot water. The Renewable Portfolio Standard has been met for 2012.

The following schedule is currently in effect:

- 6% renewables/efficiency in 2005 and 2006
- 9% renewables/efficiency in 2007 and 2008
- 12% renewables/efficiency in 2009 and 2010
- 15% renewables/efficiency in 2011 and 2012
- 18% renewables/efficiency in 2013 and 2014
- 20% renewables/efficiency in 2015 through 2019
- 22% renewables/efficiency in 2020 through 2024
- 25% renewables/efficiency in 2025 and thereafter

In addition to solar, qualifying renewable energy resources include biomass, geothermal energy, wind, certain hydropower, energy recovery processes*, and waste tires (using microwave reduction).

The Public Utilities Commission of Nevada (PUCN) has established a program to allow energy providers to buy and sell Portfolio Energy Credits (PECs) in order to meet energy portfolio requirements. One PEC represents one kilowatt-hour (kWh) of electricity generated by a portfolio energy system, with the exception of PV, for which 2.4 PECs are credited per one actual kWh of energy produced. An adder of 0.05 is tacked on to the 2.4 multiplier for PV if the system is deemed by the PUCN to be a customer-maintained distributed generation system; that is, customer-sited PV is eligible for a 2.45 multiplier. In addition, the number of kWh saved

by energy efficiency measures is multiplied by 1.05 to determine the number of PECs. For electricity saved during peak periods as a result of efficiency measures, the credit multiplier is increased to 2.0. PECs are valid for a period of four years.

To help facilitate the renewable projects required by the renewable energy portfolio standard, the PUCN established the Temporary Renewable Energy Development (TRED) Program. The TRED Program is meant to insure prompt payment to renewable energy providers in order to encourage completion of renewable energy projects. The TRED Program establishes: (1) a TRED charge, allowing investor-owned utilities to collect revenue from electricity customers to pay for renewable energy separate from other wholesale power purchased by the electric utilities; and (2) an independent TRED trust to receive the proceeds from the TRED charge and remit payment to renewable energy projects that deliver renewable energy to purchasing electric utilities.

Sierra Pacific Power and Barrick Goldstrike demonstrated in their April 1, 2010, compliance filing for year 2009 that they are in full compliance for the current solar and non-solar requirements of the Nevada RPS. Nevada Power met their solar requirements for the RPS but failed to meet their non-solar requirements and may be charged a penalty.

**The statutes define "energy recovery processes" as electricity generating systems with a nameplate capacity of 15 megawatts or less that convert the otherwise lost energy from "the heat from exhaust stacks or pipes used for engines or manufacturing or industrial processes; or the reduction of high pressure in water or gas pipelines before the distribution of the water or gas." To qualify, the system cannot use additional fossil fuel or require a combustion process to generate the electricity.*

Contact:

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Fax: (775) 684-6120
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E-Mail: amcuneo@puc.nv.gov

7.2 Loan Guarantees for Nuclear and other Carbon Control Technologies

Under final DOE rules, loan guarantees can cover up to 80% of the cost of a project, and are awarded based on a detailed evaluation of each applicant project. Entities receiving loan guarantees must make a "credit subsidy cost" payment to the federal treasury that reflects the anticipated cost of the guarantee to the government, including a probability weighted cost of default. Because the debt is backed by the federal government, it is expected to carry the highest credit rating and therefore a low interest rate. The guarantees are unavailable to publicly owned utilities, such as municipal systems.

7.3 Energy Investment Tax Credit

Tax credits under this program are available to solar and geothermal electricity generation, and some other innovative energy technologies. Wind energy systems do not qualify. The credit is 10% for geothermal systems, and is 30% for solar electric systems installed before January 1, 2017 (after which it reverts to 10%). Geothermal projects that take the investment tax credit cannot claim the renewable production tax credit. The depreciable basis of the project for tax purposes is reduced by 50% of the credit value. The investment tax credit is available to independent power producers and investor owned utilities, but is inapplicable to tax-exempt publicly owned utilities.

7.4 Renewable Energy Producers Property Tax Abatement

Generators of renewable energy in the State of Nevada may be eligible for a partial abatement of their property taxes. Details about the tax abatement program are found in Table 7.2. Contact persons for the program are also included below.

Table 7.2: Renewable Energy Producers Property Tax Abatement Details

State:	Nevada
Incentive Type:	Property Tax Incentive
Eligible Renewable/Other Technologies	Solar Thermal Electric Solar Thermal Process Heat Photovoltaics Landfill Gas Wind Biomass Hydroelectric Geothermal Electric Fuel Cells Municipal Solid Waste Facilities for the transmission of electricity produced from renewable energy or geothermal resources located in Nevada Anaerobic Digestion Fuel Cells using Renewable Fuels
Applicable Sectors:	Commercial Utility Renewable Energy Power Producers
Amount:	55% abatement for 20 years

Eligible System Size:	Minimum 10 MW
Start Date:	7/1/2009
Expiration Date:	6/30/2049
Website:	http://renewableenergy.state.nv.us/TaxAbatement.htm
Authority 1: Date Enacted: Date Effective: Expiration Date:	NRS § 701A.360, et seq. 5/30/2009 7/1/2009 6/30/2049

Summary:

New or expanded businesses in Nevada may apply to the Director of the State Office of Energy for a property tax abatement of up to 55% for up to 20 years for real and personal property used to generate electricity from renewable energy resources including solar, wind, biomass*, fuel cells, geothermal or hydro. Generation facilities must have a capacity of at least 10 megawatts (MW). Facilities that use solar energy to generate at least 25,840,000 British thermal units of process heat per hour can also qualify for an abatement.

There are several job creation and job quality requirements that must be met in order for a project to receive an abatement. Depending on the population of the county or city where the project will be located, the project owners must:

- Employ a certain number of full-time employees during construction, a percentage of whom must be Nevada residents
- Ensure that the hourly wage paid to the facility's employees and construction workers is a certain percentage higher than the average statewide hourly wage
- Make a capital investment of a specified amount in the state of Nevada
- Provide the construction workers with health insurance, which includes coverage for the worker's dependents

Note that this exemption does not apply to residential property. A facility that is owned, operated, leased or controlled by a governmental entity is also ineligible for this abatement.

History

This abatement has gone through revisions since its original inception. Most significantly, AB 522, signed in May 2009, raised the capacity minimum for eligible projects from 10 kilowatts (kW) to 10 MW. It also increased the abatement from 50% for 10 years to 55% for 20 years, extended it to additional technologies, and increased the qualification requirements to ensure that incentivized projects result in more high quality jobs. These changes took effect on July 1, 2009. AB 522 also created a sales and use tax abatement for renewable energy producers.

**Biomass is defined as any organic matter that is available on a renewable basis, including, without limitation, agricultural crops and agricultural wastes and residues; wood and wood wastes and residues; animal wastes; municipal wastes; and aquatic plants.*

Contact:

Lorayn Walser
Nevada State Office of Energy
755 North Roop Street, Suite 202
Carson City, NV 89701
Phone: (775) 687-1850 Ext.7308
Fax: (775) 687-1869
E-Mail: lwalser@energy.nv.gov
Web Site: http://energy.state.nv.us

Information Specialist - Dept. of Taxation
NV Department of Taxation
1550 E. College Parkway, Suite 115
Carson City, NV 89706
Phone: (775) 684-2000
Fax: (775) 684-2020
Web Site: http://tax.state.nv.us

7.5 Renewable Energy Sales and Use Tax Abatement

The Nevada section of the Database of State Incentives for Renewables and Efficiency (DSIRE) website outlines several different incentive programs which are available in the state. The Nevada Renewable Energy Sales and Use Tax Abatement is available as of the date of this report. Details of the program are provided in Table 7.3.

Table 7.3: Renewable Energy Sales and Use Tax Abatement Details

State:	Nevada
Incentive Type:	Sales Tax Incentive
Eligible Renewable/Other Technologies	Solar Thermal Electric Solar Thermal Process Heat Photovoltaics Landfill Gas Wind Biomass Hydroelectric Geothermal Electric Fuel Cells Municipal Solid Waste Facilities for the transmission of electricity produced from renewable energy or geothermal resources located in Nevada Anaerobic Digestion Fuel Cells using Renewable Fuels

Applicable Sectors:	Commercial Industrial Utility Agricultural Renewable Energy Power Producers
Amount:	Purchaser is only required to pay sales and use taxes imposed in Nevada at the rate of 2.6% (effective through June 30, 2011) and at the rate of 2.25% (effective July 1, 2011 – June 30, 2049
Equipment Requirements:	Systems must have a generating capacity of at least 10 MW
Start Date:	7/1/2009
Expiration Date:	6/30/2049
Website:	http://renewableenergy.state.nv.us/TaxAbatement.htm
Authority 1: Date Enacted: Date Effective: Expiration Date:	NRS § 701A.360, et seq. 5/30/2009 7/1/2009 6/30/2049

Summary:

New or expanded businesses in Nevada may apply to the Director of the State Office of Energy for a sales and use tax abatement for qualifying renewable energy technologies. Purchaser is only required to pay sales and use taxes imposed in Nevada at the rate of 2.6 % (effective through June 30, 2011) and at the rate of 2.25 % (effective July 01, 2011 - June 30, 2049). The start date begins when the first piece of equipment is delivered to the designated facility or taxes are paid on the equipment.

The abatement applies to property used to generate electricity from renewable energy resources including solar, wind, biomass*, fuel cells, geothermal or hydro. Generation facilities must have a capacity of at least 10 megawatts (MW). Facilities that use solar energy to generate at least 25,840,000 British thermal units of process heat per hour can also qualify for an abatement.

There are several job creation and job quality requirements that must be met in order for a project to receive an abatement. Depending on the population of the county or city where the project will be located, the project owners must:

- Employ a certain number of full-time employees during construction, a percentage of whom must be Nevada residents
- Ensure that the hourly wage paid to the facility's employees and construction workers is a certain percentage higher than the average statewide hourly wage
- Make a capital investment of a specified amount in the state of Nevada
- Provide the construction workers with health insurance, which includes coverage for the worker's dependents

Note that this exemption does not apply to residential property. A facility that is owned, operated, leased or controlled by a governmental entity is also ineligible for this abatement. Note that this exemption does not apply to residential property, or property that is owned, operated, leased or controlled by a governmental entity.

History

This abatement went through significant revisions with AB 522, signed in May 2009. Notably, AB 522 raised the capacity minimum for eligible projects from 10 kilowatts (kW) to 10 MW. It also changed the abatement such that the purchaser is only required to pay sales and use taxes imposed in Nevada at the rate of 2.6% (effective through June 30, 2011) and at the rate of 2.25% (effective July 01, 2011 – June 30, 2049), extended it to additional technologies, and increased the qualification requirements to ensure that incentivized projects result in more high quality jobs. These changes took effect on July 1, 2009. AB 522 also created a property tax abatement for renewable energy producers.

**Biomass is defined as any organic matter that is available on a renewable basis, including, without limitation, agricultural crops and agricultural wastes and residues; wood and wood wastes and residues; animal wastes; municipal wastes; and aquatic plants.*

Contact:

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NV Department of Taxation
1550 E. College Parkway, Suite 115
Carson City, NV 89706
Phone: (775) 684-2000
Fax: (775) 684-2020
Web Site: http://tax.state.nv.us

7.6 NV Energy, RenewableGenerations Rebate Program

The RenewableGenerations Rebate Program periodically opens and closes subsequent to availability of rebates. Details about the program can be found in Table 7.4.

Table 7.4: NV Energy RenewableGenerations Rebate Program Details

State:	Nevada

Incentive Type:	Sales Rebate Program
Eligible Renewable/Other Technologies	Photovoltaics Wind Small Hydroelectric
Applicable Sectors:	Commercial Residential Non-Profit Schools Local Government State Government Agricultural Other Public Buildings
Amount:	Program is on hold for solar and wind (as of the writing of this report) Solar (Steps 1, 2, and 3): Schools and public and other property including non-profits and churches: $5.00 per watt AC Residential and small business property: $2.30 per watt AC Wind (Step 3): Residential, small business and agriculture: $2.50 per watt Schools and public buildings: $3.50 per watt Small Hydro: Non-net metered systems: $2.00 per watt Net metered systems: $2.25 per watt
Eligible System Size:	Maximum of 1 MW
Equipment Requirements:	Solar: Systems must be in compliance with all applicable standards; Must carry a minimum 7-year warranty on inverters, 20-year warranty on panels, and 2-year warranty on labor; Modules and inverters must be on the California Energy Commission approved equipment list. Wind: Systems must be in compliance with all applicable standards; Generator must be listed or certified by at least one of the following organizations: American Wind Energy Association (AWEA), British Wind Energy Association (BWEA), California Energy Commission, New York State Energy and Research Development Authority (NYSERDA), Small Wind Certification Council (SWCC) Hydro: Systems must be in compliance with all applicable standards and under 200 kW
Installation Requirements:	Installations must comply with all federal, state and local codes and meet detailed siting criteria specified in program outlines. Systems must be grid-connected and net metered. Solar systems must be installed by a Nevada-licensed electrical C-2 or C-2g electrical contractor. Wind and microhydro systems must be installed by a Nevada-licensed C-2 electrical contractor.
Ownership of Renewable Energy Credits	NV Energy
Website:	http://www.Nvenergy.com/renewablegenerations

Authority 1:	NRS § 701B.010 et seq.
Authority 2:	Senate Bill 358
Date Enacted:	5/28/2009
Authority 3:	LBC File R175-07

Summary:

Note: At the writing of this report, the solar and wind energy incentive programs are currently fully subscribed and not accepting applications.

NV Energy (formerly Sierra Pacific Power and Nevada Power) administers the RenewableGenerations Rebate Program for PV systems and small wind and hydroelectric systems on behalf of the Nevada Task Force on Energy Conservation and Renewable Energy. With rebates originally available only for PV, the SolarGenerations Rebate Program was established in 2003 as a result of AB 431 ("the Solar Energy Systems Demonstration Program") and began in August 2004. Rebates may be available for grid-connected PV installations on residences, small businesses,* public buildings, non-profits and schools; small wind systems on residences, small businesses, agricultural sites, schools and public buildings; and small hydroelectric systems installed at grid-connected agricultural sites. Participants must be current Nevada customers of NV Energy to participate.

SB 358 of 2009 made adjustments to the administration of the RenewableGenerations program. After the utility approves the applicant, the utility will have 30 days to notify them in writing. Further, applicants will have 12 months to complete a project following their initial approval. If projects that have been approved miss the 12-month target date, they can become eligible again after the project is complete, but will receive an incentive at the current rate, rather than the rate when they received initial authorization.

Including three years as a demonstration program, SolarGenerations is now in its seventh program year. In June 2007 the program was made permanent (the planned end date had been June 2010 for a total of six years of demonstration program funding). As demonstrated above, incentive levels vary by technology type, customer class and program year, with incentive levels stepping down with each program year. Each program year has a designated amount of installed capacity set aside for each customer class. Applications received after one step is fully subscribed for that customer class may be reserved for the next incentive step. All applicants have 12 months to complete their installation.

There are no size restrictions for participating systems, aside from the net metering limits, but rebates will be limited to certain system sizes corresponding to the customer class and the technology.

NV Energy takes ownership of the renewable energy credits (RECs) associated with the electricity produced by a customer’s PV, wind or small hydro system. The RECs count towards the utility's goals under Nevada's RPS.

The SolarGenerations Rebate Program was open for applications between September 16 and September 28, 2011, at which time a lottery was held to pick recipients for awards in 2011-2012. As of the date of this report, the program is currently closed to applications. WindGenerations is also closed as of the date of this report. Results of lottery selection were announced on December 15, 2011. HydroGenerations is currently open for applications. NV Energy customers with agriculture property and Indian Reservations are eligible to apply. More information about the program and applications may be found at: http://www.nvenergy.com/renewablesenvironment/renewablegenerations/hydrogen/index.cfm

** The Nevada Public Utility Commission has defined "small business" as a business with 500 or fewer employees worldwide.*

Contact:

John Hargrove
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Web Site: http://www.nvenergy.com/

7.7 Portfolio Energy Credits (PEC)

The PEC program is not available to owners of renewable energy systems which were installed using the RenewableGenerations program. Details of the PEC program may be found in Table 7.5.

Table 7.5: Portfolio Standard Details

State:	Nevada
Incentive Type:	Performance-Based Incentive
Eligible Efficiency Technologies	Unspecified Technologies

Eligible Renewable/Other Technologies	Passive Solar Space Heat Solar Water Heat Solar Space Heat Solar Thermal Electric Solar Thermal Process Heat Photovoltaics Landfill Gas Wind Biomass Hydroelectric Geothermal Electric Municipal Solid Waste Waste Tires (using microwave reduction) Geothermal Hot Water District Heating Systems Solar Pool Heating Anaerobic Digestion Biodiesel
Applicable Sectors:	Commercial Industrial Residential Nonprofit Schools Local Government Utility State Government Tribal Government Agricultural Institutional
Amount:	Varies; higher value for solar PECs than other technologies
Terms:	Owners of PV, wind, or hydro systems installed through NV Energy's RenewableGenerations (rebate) Program do not retain the PECs associated with their electricity generation, and thus are not eligible to trade certificates through this program
Start Date:	2/23/2006
Website:	https://www.nvtrec.com
Authority 1: Authority 2: Date Effective:	NAC 704.8901 et seq. LCB File R167-05 (Revised Regulations) 2/23/2006

Summary:

Nevada's Energy Portfolio Standard requires the Nevada Energy to derive or save a minimum percentage of the electricity it sells from renewable energy resources or energy efficiency measures. Included in the standard is a PEC trading program.

Beginning January 1, 2003, Nevada's renewable energy producers can earn PECs, which can then be sold to utilities or other entities that are required to meet Nevada's portfolio standard. One PEC represents one kilowatt-hour of electricity generated, with the exception of photovoltaics, for which 2.4 PECs are credited for each kilowatt-hour generated. Customer-

maintained distributed renewable energy systems receive a 0.05 added for each kilowatt-hour generated. For example, a distributed PV system that is also customer-maintained would be credited 2.45 for each kilowatt-hour generated. Energy efficiency resources receive a multiplier of 1.05, and a multiplier of 2.0 if they save electricity during periods of peak utility load. Solar thermal energy systems are credited with 1 kilowatt-hour of electricity for each 3,412 British thermal units of heat generated. Finally, each kilowatt-hour of electricity generated by eligible waste tire facilities is credited at 0.7.

In order to participate, owners of renewable energy systems must contact the PUCN to register their system. A very simple application form is available on the PUCN web site. The value of a PEC is market-driven. PECs issued to a renewable energy system owner by the PUCN are valid for four years.

Owners of PV, wind, or hydro systems installed through NV Energy's RenewableGenerations (rebate) Program do not retain the PECs associated with their electricity generation, and thus are not eligible to trade certificates through this program.

Contact:

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PEC Administrator
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8.0 RISK

Risk assessment involves the probability that the project will have a significantly different outcome than expected. Development of renewable energy projects involves different degrees of risk at different stages of project evaluation and operation. A brief description of the types of risk for the alternative renewable energy installations is presented herein.

8.1 Geothermal Risks

The largest risk for developing a geothermal energy project occurs during exploration and early development of the heat source. Due to the depth of most geothermal resources, drilling is expensive to define the size and temperature characteristics of the heat source. As the project proceeds into development, drilling costs increase for larger holes needed for production and reinjection. Risks during exploration and development include:

- Missing the target source
- Insufficient fluid system
- Insufficient temperature to support a generating plant
- Insufficient size to sustain a design temperature
- Drilling problems including geologic formations, faults, artesian fluids, and gases
- Weather and access delays during exploration
- Permitting delays

Risks are inherent with exploration of minerals as well; however the level of risk is higher in geothermal exploration and may preclude most miners from prospecting for geothermal resources.

Risks during development and operations include:

- Inability to develop the well
- Equipment failure
- Dilution of heat source during operation and reinjection
- Natural disaster such as seismic events, floods, wildfires, etc.

8.2 Solar Risks

The risks inherent to a solar energy project include:

- Wildlife concerns
- Visual impacts

- Weather (high winds, icing, hail, snow)
- Foundation issues (differential settlement, uplift)
- Natural disaster such as seismic events, floods, wildfires, etc.
- Offtaker agreements and limitations (power purchase agreement)
- Permitting delays
- Equipment failure

8.3 Wind Risks

The risks inherent to a wind energy project include:

- Insufficient or inaccurate wind resource assessment
- Wildlife concerns (birds and bats)
- Height constraints (radar and military aviation)
- Sound and visual impacts
- Weather (high winds, icing)
- Foundation issues (differential settlement, uplift)
- Natural disaster such as seismic events, floods, wildfires, etc.
- Offtaker agreements and limitations (power purchase agreement)
- Permitting delays
- Equipment failure

8.4 Mine Risks

Redevelopment or co-development of renewable energy facilities on a mine site could have some risk factors that would need to be considered in addition to the risks described above. Most of these risks will be reduced in probability and magnitude with closure planning and monitoring following mining activities; however additional design and monitoring may be prudent for a long-term installation.

Reclamation and redevelopment of mine sites generally focuses on the following objectives:

- physical stabilization of steep-walled or steep-sided facilities to mitigate potential for ground movement and erosion by water or air,
- chemical stabilization of facilities with the potential to generate acidity or solutes when leached by meteoric water,

- revegetation of disturbed areas with native non-invasive species, and
- reclamation of disturbed land to a condition suitable for a post-mining use.

Tentative and temporary reclamation plans are included in mine operating plans for the purpose of evaluating the environmental impacts of operations and to establish reclamation cost estimates. Final permanent reclamation plans are developed by operators and approved by regulatory agencies approximately two years prior to the cessation of mining operations.

The details of mine reclamation and redevelopment plans are inherently site-specific and facility-specific due to their individual location, physical, chemical, and land use properties. General properties of common mine facilities are discussed below.

Open Pits

Open pit facilities vary widely in their areas, depths, slopes, and hydrologic properties. In general at reclamation, operating benches, highwalls and haul roads are left in place with no active revegetation effort. Safety barriers (e.g., berms, fencing, or other appropriate barriers) are installed at the perimeter of the pit to control inadvertent access by people, livestock and most wildlife.

Post-closure, open pits can be placed in categories based on their hydrology, i.e.,

- dry pits,
- pit lakes with benign water chemistry,
- pit lakes with water chemistry that poses a human health or ecological risk, and
- partially or fully backfilled pits where water within the pit is not exposed at the surface.

Open pit physical and chemical characteristics are evaluated and monitored throughout the life of the mine so that appropriate safety and environmental protection measures can be taken at closure.

Given the availability of mine disturbance around an open pit, renewable energy platforms could typically be located an appropriate distance from the steep pit slopes as determined by geotechnical data and evaluation. The potential use of pit lakes as a water supply would depend on the site-specific water chemistry available and the requirements for a renewable energy application. In general, acidic or saline water chemistries would have less utility than pH-neutral waters with moderate to low total dissolved solids (TDS).

Underground Workings

Underground mining facilities vary as widely as open pit facilities in their dimensions, hydrologic and chemical properties. However, their only expressions at the ground surface typically consist of access portals and shafts plus smaller ventilation openings. At closure, these

openings are plugged to prevent inadvertent access by people, livestock, and wildlife unless the closure plan calls for a specific form of post-closure use (e.g., bat habitat).

Contemporary mining practices call for the backfill of most underground workings with a cemented fill to reduce the potential for subsidence. However, the potential for surface subsidence should be considered in evaluating placement of renewable energy platforms.

Roads

Unless Right-of-Ways (ROWs) are established to maintain roads after mine closure, mine access and haul roads are recontoured and revegetated to be similar with the surrounding topography. Reclaimed roads present little in the way of risk to establishing renewable energy platforms, however, a ROW for the site access would need to be secured to remove the reclamation obligation for that roadway.

Tailings Impoundments and Heap Leach Facilities

The designs of tailings impoundments and heap leach facilities are more standardized than other mine facilities, as these process facilities must comply with design standards mandated by the Nevada Administrative Code and Federal cyanide management program.

Closure of tailings impoundments and heap leach facilities involves activities related to physical and chemical stabilization of the facilities, i.e.,

- regrading facility slopes to 2.5H:1V or shallower,
- managing drainage of process solutions from tailings and heap leach ore for a period of years following the end of operations, and
- installing a revegetated cover to prevent erosion and inhibit introduction of meteoric waters into the tailings material.

Performance of the water management system and revegetated cover are critical to the facility closure and would need to be maintained in the event of renewable energy platform development. The facility closure needs would place limitations on the location of the renewable energy platform (i.e., away from water management infrastructure) and would preclude any excavated footers or foundations that were not specifically designed to maintain the integrity of the revegetated cover.

Finally, as water management ultimately decreases the water balance of the reclaimed facility, settlement due to the desaturation will occur. Typically, this settlement is small in scale, but would need to be evaluated prior to establishment of a renewable energy platform.

Waste Rock Facilities

Similar to open pits and underground workings, waste rock facilities vary widely in area, height, slope, location, and material composition.

Contemporary mining practices call for monitoring and construction of waste rock facilities to minimize the risk for acidic drainage and/or metal leaching by meteoric or surface waters. These practices include construction of stormwater diversions around facilities and placement of environmentally adverse (e.g., potentially acid-generating) materials in the interior of facilities with appropriate bases, sides, and covers formed from non-reactive materials.

Closure of waste rock facilities involves activities related to their physical and chemical stabilization, i.e.,

- regrading facility slopes to 2.5H:1V or shallower,
- sequestering environmentally adverse materials away from surface exposure, and
- installing a revegetated cover to prevent erosion and reduce introduction of meteoric waters into the waste rock material.

Effective closure would place limitations on the excavation of footers or foundations that were not specifically located and designed to maintain the integrity of the revegetated cover and avoid exposure of environmentally adverse materials.

While waste rock facilities experience compaction related subsidence during mining operations, surface subsidence is typically minor following closure. However, geotechnical considerations should be applied prior to the location of renewable energy platforms in the vicinity of reclaimed slopes.

Mine Buildings and Yards

As part of mine reclamation, hazardous and non-hazardous materials are removed from buildings and yards prior to the demolition and revegetation of these facilities.

Reclaimed buildings and yards should have little effect on the location of renewable energy platforms, but those locations should be known and considered during the platform designs.

Unless specifically retained for a redevelopment use, mine buildings would be demolished and removed as part of mine closure.

General Mine Area

By its nature, mining relocates large amounts of earthen materials from their pre-mining locations, plus temporarily displaces groundwater from the mine vicinity if the mine excavates materials from below the local water table.

The relocation of earthen material and groundwater may result in surface subsidence and/or rebound in the mine area, as the ground surface adjusts to the new weight distribution of the relocated materials. Subsidence and rebound movement typically abates at the conclusion of active mining. However, stresses induced by differential subsidence or rebound may affect the geotechnical strength of the post-closure ground surface. As with any renewable construction

platform design and construction, the geotechnical properties of the ground surface should be evaluated.

8.5 Safety Considerations

Renewable energy projects integrated into a working mine site may result in more frequent visits to the property by the public or other individuals who do not have proper certification to enter mine sites. This could result in the public or other individuals coming into contact with mine facilities or other reclaimed mine features that could pose a physical threat to these untrained individuals.

Current Mine Safety and Health Administration regulations require any individuals who have access to a mine site to receive safety training before entering the site. Owners, contractors, sub-consultants and laborers working on renewable energy projects should be MSHA certified and have site-specific safety training for the associated mine.

Project boundaries, fences, access roads, secured access gates, etc., may need to be implemented into working and/or reclaimed mines. These safety boundaries may need to stay in place for several years after the mine has been reclaimed to limit the public (and non-mining employees) access to areas that could pose a physical threat from post-mining features.

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9.0 CRITICAL SUCCESS FACTORS

Many renewable energy projects have had great success bringing affordable and environmentally acceptable with the associated jobs energy to rural areas. The LEDA REDS project set out to identify the key factors which need to be in place to maximize the success potential for renewable energy projects on proposed, existing or abandoned mine sites. Critical Success Factors have been identified by the analysis of successful projects, and the attributes associated with them that may exist at mine sites. It is essential to perform a mine site Critical Success Factor assessment to determine the Critical Success Factors that reside at a specific mine site.

Based on the results of this study, the characteristics of renewable energy technologies were found to vary widely in scale, level of sophistication, and are highly location dependent.

The following are Critical Success Factor categories for each mine site to assess:

- Universal Critical Success Factors (basic requirements)
    i. Available renewable energy source
    ii. Community support & labor force availability
    iii. Electrical Infrastructure: substation & electrical transmission lines to grid
    iv. Civil Infrastructure: site access and road quality
    v. Renewable energy development consistent with land use plans
- Critical Success Factors for project proponent
    i. Compatible with existing POO or reclamation plan
    ii. Compatible with future mining projects (non-mineralized lands utilized)
    iii. Condemnation drilling has been performed on land to be developed
    iv. Tax equity appetite or need for Production Tax Credit and Investment Tax Credit
    v. Need for Renewable Energy Credits (RECs)
    vi. Environmental permitting is secured
- Critical Success Factors for the individual renewable technologies (See Table 9.2)
    i. Geothermal resource is constant and high enough temperature
    ii. Wind resource is sufficient to support project economics
    iii. Solar resource is constant
- Critical Success Factors for rural electrification at specific locations
    i. There is an acceptable off-taker (mine, other third-party or public utility via existing transmission grid)

ii. NV Energy can accept newly established energy markets at this location (additional electricity can be accepted into the grid at this location)

1. Based on NV Energy Transmission Study (line capacity study)
2. Project support from NV Energy RenewableGenerations

- Critical Success Factors for governing agencies

i. Renewable energy development consistent with land use plans

1. BLM Resource Management Plan
2. Other government agencies, i.e., County Master Plans

ii. Environmental permitting is secured

iii. Voluntary secondary POO, including renewable project, was submitted with the POO

iv. Comply with Federal goals to promote renewable energy on public lands

Table 9.1 can be used to assess the feasibility of a renewable energy project based on Critical Success Factors.

Table 9.1: Critical Success Factors Matrix

Critical Success Factor	Geothermal	Solar	Wind
Renewable resource available			
Community support & labor force availability			
Civil Infrastructure			
Electrical Infrastructure			
Renewable energy consistent with land use plans			
Compatible with existing POO or reclamation plan			
Compatible with future mining projects			
Condemnation drilling has been performed			
Tax equity appetite			
Need Renewable Energy Credits (RECs)			
Environmental permitting is secured			
Acceptable off-taker			
NV Energy cooperation			
Voluntary secondary POO submitted			
Comply with Federal renewable energy goals			

Table 9.2: Renewable Energy Infrastructure (10 MW Footprint) Critical Success Factors

Type	Area Needed (acres)	Facility Location on Mine Site	Notes
Geothermal	~2	Near the geothermal resource	Need minimum 250° F resource and geothermal leasing rights available
Solar			Lander County has good solar resource
Linear Concentrator	~100	Flat areas on undisturbed surfaces, dry open pits, non-ARD waste rock disposal facilities	Available water source
Power tower	~100	Flat areas on undisturbed surfaces, dry open pits, non-ARD waste rock disposal facilities	Aviation restrictions may apply
PV	~15	Flat areas on undisturbed surfaces, dry open pits, non-ARD waste rock disposal facilities, south-facing tailings impoundments	Unobstructed view to the south
Wind	~320	Near ridge tops or wherever wind is strongest and most consistent	Need minimum 7 meters per second (15.7 mph) resource or greater; aviation restrictions may apply

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10.0 CONCLUSIONS

10.1 Geothermal

Geothermal energy is the most feasible renewable energy type. Currently, known geothermal resources in Lander County do not coexist with active mines. Unless a geothermal resource has already been identified within about 3 miles of a mine, it may not be economically feasible to conduct geothermal exploration with the specific intent of utilizing the mine site for a renewable-energy power plant.

The costs of a 10 MW power plant and associated infrastructure are comparable, but the costs of geothermal exploration and well drilling, all without any guarantee of success, could significantly increase the costs of a geothermal project. The primary attraction to geothermal is the fact that it produces continuously and can be sustained for many years. A typical geothermal power plant will operate 90 to 95% of the time.

10.2 Solar

Solar power holds great promise for mine sites due to the technologies ease of construction and that it's not as location/resource dependent. Solar PV can be designed into mine design provided enough flat or terraced land is available. Solar thermal (CSP) installations can take advantage of water resources found in pit lakes or utilize stadium-type walls designed into a leach pad or as found in a dry mine pit. The ability to construct a solar project on or adjacent to mine sites offers good use of infrastructure such as transmission lines and sub stations. These attributes may offset the additional cost of solar energy compared with other technology's.

10.3 Wind

Wind energy has moderate potential on mine sites in Lander County due to marginal wind speeds in the valleys where the mine facilities are typically located.

The best opportunities to develop wind projects are on the Argenta Rim in northern Lander County. This area offers transmission, possible lower construction costs, private land and proximity to both freeway and rail; however, no active mine sites exist in this area.

Southern and eastern Lander County also have adequate wind resource areas, but are not on existing mine sites. Future mine developments may be able to exploit these wind resources.

Radar and military aviation height constraints may limit the use of megawatt-scale turbines (over 200 ft in height). Most areas of Lander County have constraints, but none rule out project development.

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APPENDIX A: RENEWABLE ENERGY PROJECTS IN NEVADA

Source: NV Office of Energy Renewable Energy Projects

Renewable Energy Projects in Nevada

GEOTHERMAL								updated 5/17/11
Project Name	**County**	**MW**	**Developer**	**Energy Type**	**Land Type**	**Online Date**	**Offtake**	**Status**
Beowawe	Lander/Eureka	17	Terra-Gen Power	Geothermal	BLM	Now	NVE	In Service
Blue Mountain	Humboldt	49	Nevada Geothermal Power	Geothermal	BLM/Private	Now	NVE	In Service
Brady Hot Springs	Churchill	26	Ormat Technologies	Geothermal	BLM	Now	NVE	In Service
Desert Peak 1 & 2	Churchill	19	Ormat Technologies	Geothermal	BLM	Now	NVE	In Service
Dixie Valley	Church/Persh	67	Terra-Gen Power	Geothermal	BLM	Now	SCE	In Service
Galena 2 & 3	Washoe	39	Ormat Technologies	Geothermal	BLM	Now	NVE	In Service
Salt Wells	Churchill	23	Enel North America	Geothermal	BLM	Now	NVE	In Service
San Emidio (Empire)	Washoe	5	U.S. Geothermal	Geothermal	BLM/Private	Now	NVE	In Service
Soda Lake Complex	Churchill	27	Magma Energy Corp.	Geothermal	BLM	Now	NVE	In Service
Steamboat Hills	Washoe	49	Ormat Technologies	Geothermal	BLM	Now	NVE	In Service
Stillwater	Churchill	47	Enel North America	Geothermal	BLM	Now	NVE	In Service
Homestretch 1/2/3	Lyon	2	Homestretch Geothermal	Geothermal		Now	NVE	In Service
Richard Burdette	Washoe	26	Ormat Technologies	Geothermal		Now	NVE	In Service
Jersey Valley	Persh/Lander	30	Ormat Technologies	Geothermal	BLM	Now	NVE	In Service
Carson Lake Geothermal	Churchill	20	Ormat/NV Energy	Geothermal	BLM	TBD	NVE	PPA, Final Permits
Carson Lake Basin	Churchill	62	Reliant Energy	Geothermal	BLM	TBD	NVE	PPA, In Development
Devil's Canyon	Nye	10	Raser Technologies	Geothermal	BLM/Private	TBD	TBD	PPA, Final Permits
McGinness Hills	Lander	30	Ormat Technologies	Geothermal	BLM	2014	NVE	PPA, Final Permits
Salt Wells	Churchill	120	Reliant Energy	Geothermal	BLM	TBD	NVE	PPA, EIS, BLM Priority
Salt Wells	Churchill	40	Ormat Technologies	Geothermal	BLM	TBD	TBD	EIS Done, BLM Priority
Trail Canyon	Nye	10	Raser Technologies	Geothermal	BLM	TBD	TBD	PPA, Final Permits
Hot Sulphur Springs	Elko	25	Ormat Technologies	Geothermal		2013	NVE	PPA, Final Permits
Clayton Valley	Esmerelda	160	Ram Power	Geothermal	BLM	2014	NVE	Regulatory Approval
Barren Hills	Lyon	46	Barren Hills Geo Power	Geothermal	BLM	2014/2015	TBD	Exploration
Coyote Canyon	Churchill	62	Terra-Gen Power	Geothermal	BLM	TBD	TBD	Final EA, BLM Priority
Dead Horse	Mineral	30	Ormat Technologies	Geothermal	BLM	TBD	TBD	Exploration
Dixie Meadows	Churchill	62	Terra-Gen Power	Geothermal	BLM	TBD	TBD	Exploration
Leach Hot Springs	Churchill	TBD	Ormat Technologies	Geothermal	BLM	TBD	TBD	Exploration
Gabbs Valley	Mineral	30	Ormat Technologies	Geothermal	BLM	TBD	TBD	Exploration
New York Canyon	Pershing	62	Terra-Gen Power	Geothermal	BLM	TBD	TBD	Exploration
Panther Canyon	Pershing	34	Magma Energy Corp.	Geothermal	Private	TBD	TBD	Exploration

Renewable Energy Projects in Nevada

Patua	Church/Lyon	60	Reliant Energy	Geothermal	BLM	TBD	TBD	Exploration
Alum	Esmerelda	33	Sierra Geothermal Power	Geothermal	BLM	2013/2014	TBD	Exploration
Silver Peak	Esmerelda	15	Sierra Geothermal Power	Geothermal	BLM	2012	TBD	Exploration
Reese River	Lander	26	Sierra Geothermal Power	Geothermal	BLM	2012	NVE	Exploration

SOLAR								
Project Name	**County**	**MW**	**Developer**	**Energy Type**	**Land Type**	**Online Date**	**Offtake**	**Status**
LV Valley Water Dist.	Clark	3	PowerLight Corporation	Solar PV		Now	NVE	In Service
Nellis Air Force Base	Clark	13	Fotowatio Nevada Solar	Solar PV	Military	Now	NVE	In Service
Nevada Solar One	Clark	64	Acciona Power Company	Solar Thermal	BLM	Now	NVE	In Service
Super Solar Phase 1	Carson/Clark	3.4	Sierra Nevada Corp	Solar PV	Private	Now	NVARNG	In Service
Copper Mountain	Clark	48	Sempra Generation	Solar PV		Now	PG&E	In Service
Searchlight 1	Clark	17.5	American Capital Energy	Solar PV		2011	NVE	Signed PPA
RV Apex Solar	Clark	20	Fotowatio Nevada Solar	Solar PV	Private	2011	NVE	Signed PPA
Spectrum Solar	Clark	37	Fotowatio Nevada Solar	Solar PV		2012	NVE	Signed PPA
Toquop Energy Project	Clark	100	Sithe Global	Solar		2012	TBD	Amended App. to BLM
Aurora Solar Tonopah	Nye	20-30	Iberdola	Solar PV	Private	2012	TBD	Negotiating Lease w/ Nye
Indeck Tonopah Solar	Nye	16	Indeck Tonopah Solar	Solar PV	BLM/Private	2012	NVE	Construction 10/2011
Crescent Dunes	Nye	180	SolarReserve	Solar Thermal	BLM	2013	NVE	BLM Priority, ROD Signed
Eldorado Valley Solar	Clark	457	SolBio Energy	Solar		2013	CA	Lease Executed
Coyote Springs 1 & 2	Clark	400	BrightSource	Solar Thermal	Private	2014	TBD	Permitting Complete, No PPA
Armagosa Farm Road	Nye	460	Solar Millennium	Solar Trough	BLM	2014	VEA	BLM Priority, ROD Signed
Silver State South	Clark	340	First Solar	Solar PV	BLM	2014	SCE	BLM Decision 2012, PPA
Silver State North	Clark	60	First Solar	Solar PV	BLM	TBD	NVE	ROD Signed, BLM Priority
Dry Lake Valley	Clark	120	NV Energy	Solar	BLM/Private	TBD	NVE	Filed PUC UEPA

WIND								
Project Name	**County**	**MW**	**Developer**	**Energy Type**	**Land Type**	**Online Date**	**Offtake**	**Status**
Spring Valley	White Pine	150	Pattern Energy Group	Wind	BLM	2011	NVE	BLM Priority, ROD Signed
China Mountain	Elko	200	RES Americas/NV Energy	Wind	BLM/Private	2013	NVE	EIS & ROD 2011
Searchlight Wind	Clark	200	Duke Energy	Wind	BLM	TBD	WAPA	BLM Priority
New Comstock Cinder Mtn	Storey	120	Great Basin Wind	Wind	BLM	TBD	TBD	Developing EIS
Virginia Peak	Washoe	150	Nevada Wind	Wind	Private	TBD	TBD	Special Use Permit, Washoe

Renewable Energy Projects in Nevada

OTHER								
Project Name	**County**	**MW**	**Developer**	**Energy Type**	**Land Type**	**Online Date**	**Offtake**	**Status**
Sierra Pacific Industries	Loyalton, CA	10	Sierra Pacific Industries	Biomass		Now	NVE	In Service
Truckee Carson Irrigation	Lyon	0.4	Truckee Carson Irrigation District	Hydro Electric		Now	NVE	In Service
Stampede	Washoe	4	WAPA - Dept. of Reclamation	Hydro Electric		Now	NVE	In Service
Frank Hooper	Elko	0.7	Hooper Hydro Electric	Hydro Electric		Now	NVE	In Service
TM Water Reclamation	Washoe	0.8	City of Sparks	Methane		Now	NVE	In Service
CC Landfill Energy	Clark	11	Energetic	Biomass	Private	2011	NVE	Signed PPA, In Devel
Lockwood Landfill	Washoe	3	Waste Management	Landfill Gas		2011	NVE	Signed PPA
White Pine Pumped Stor.	White Pine			Pumped Stor.				FERC Prelim. Permit

TRANSMISSION								
Project Name	**County**	**Voltage**	**Developer**	**Energy Type**	**Land Type**	**Online Date**	**Offtake**	**Status**
VEA Line	Nye/Clark	230kv	Valley Electric Assn	Transmission	BLM/Private	2012		Start Soon
ON Line	Various	500kv	NV Energy/LS Power	Transmission	BLM	2013	NVE	EIS Complete
SW Intertie Project (SWIP)	White Pine	500kv	Great Basin Transmission	Transmission	BLM	TBD		
Solar Express	Armagosa	500kv	RETCO	Transmission	BLM/Private	2014	Calif.	

9-Jun-11

Note: This is not a complete list of projects in Nevada. Projects in their initial phases of exploration are not included. Notify the NSOE if a mature project is not included.

APPENDIX B: MAPS

Land Survey Township Index

Springs, Wells and Geologic Features

Mining Districts and Geothermal Leases

Mines and Mining Districts

Geothermal Gradients

Geothermal Leases, Springs and Wells

Geothermal Leases, Springs, Wells and Thermal Gradients

Thermal Gradient and Mining Districts

APPENDIX C: GEOTHERMAL PERMITTING CHECKLISTS

Recommended Information Submittal for Geophysical Exploration Projects NOT Including Temperature Gradient Holes

Checklist from BLM IM NV-2010-066: Recommended Information Submittal for Geophysical Exploration Projects NOT including Temperature Gradient holes. Provide the following information per CFR 43 CFR 3251.11. Based on this information, BLM may determine that the project is casual use and does not require an NOI.

- Completed Form 3200-9, Notice of Intent to Conduct Geothermal Resource Exploration Operations (NOI).
- Proposed start and end date.
- Legal land description - Meridian, Township, Range, Section (MTRS).
- Surface ownership including other surface management agencies.
- Geothermal leases to be affected if applicable.
- Description of equipment to be used including size and weight. Include description of staging and lay down areas.
- Length and width of access roads to be developed or maintained. Cross country access roads and number of trips.
- Photographs of equipment to be used and disturbance created by the equipment.
- Estimate of acres to be disturbed and dimensions of disturbance.
- Hard copy and electronic copies of an overview map and a 1:24,000 scale contour map that includes: title, MTRS, scale, legend, land status, lease boundary, location of disturbance, existing and proposed roads, overland travel routes, point data for equipment such as receivers, locations of staging and lay down areas.
- Shape files with complete metadata including data projection, map author, and date of creation.
- Detailed description of the environmental protection measures and best management practices.
- Description of surface reclamation methods.

Recommended Information Submittal for Geophysical Exploration Projects for Temperature Gradient Holes

Checklist from BLM IM NV-2010-066: Recommended Information Submittal for Geophysical Exploration Projects for Temperature Gradient holes. Provide the following information per 43 CFR 3251.11.

- Completed Form 3200-9, Notice of Intent to Conduct Geothermal Resource Exploration Operations (NOI). One NOI form can be used for multiple temperature gradient holes.
- Description for disturbance proposed including:
  - Well site layout and design; dimensions of well pads, grading required for pads, diagram showing layout of equipment and supplies on well pad;
  - Sumps; include sump dimensions and volume of fluid to be contained;
  - Staging / lay down areas; dimensions of these areas or whether well pads will be used;
  - Roads; length and width of access roads and turnouts to be developed or maintained, culvert designs and placement, Rights-of-Ways (ROW) if required, cross country access and number of cross country trips.
- Estimate of acres to be disturbed and dimensions of disturbance.
- Description of equipment to be used including size and weight of vehicles.
- Proposed start and end date.
- Legal land description - Meridian, Township, Range, Section (MTRS).
- Surface ownership including other surface management agencies.
- Photographs of equipment to be used and disturbance created by the equipment.
- Hard copy and electronic copies of an overview map and a 1:24,000 scale contour map that includes: title, MTRS, scale, legend, land status, lease boundary, location of disturbance, existing and proposed roads, overland travel routes, point data for equipment such as receivers, locations of staging and lay down areas.
- Shape files with complete metadata including data projection, map author, and date of creation.
- Geothermal leases to be affected if applicable.
- Depth of each temperature gradient hole.
- Casing and cementing program.
- Circulation media, i.e., mud, air, foam, etc.
- Description and diagram of the blowout prevention equipment to be used.
- Description of logs to be run.

- Expected depth of fresh water zones.
- Anticipated loss of circulation zones.
- Anticipated temperature gradient in the area if known.
- Diagram / map of well site layout and design.
- Source of drill pad and road borrow material.
- Water source.
- Bond coverage information.
- Detailed description of the environmental protection measures and best management practices.
- Description of surface reclamation methods.

Recommended Project Documentation Submittal for Operations Plan for Exploratory Drilling and Well Testing

Checklist from BLM IM NV-2010-066; Recommended Project Documentation Submittal for Operations Plan for Exploratory Drilling and Well Testing. Provide the following information per 43 CFR 3261.12.

- Description of proposed disturbance which may include:
  - Well pads; dimensions of well pads, grading required for pads, diagram showing layout of equipment and supplies on well pad;
  - Sumps; include sump dimensions and volume of fluid to be contained;
  - Equipment to be used for well testing, well test duration, volume of fluids anticipated, description of how fluids will be contained;
  - Staging / lay down areas; dimensions of these areas or whether well pads will be used;
  - Worker camps; dimensions of the area or whether well pads will be used;
  - Roads; length and width of access roads and turnouts to be developed or maintained, culvert designs and placement, Rights-of-Ways (ROW) if required, cross country access and number of cross country trips;
  - Table summarizing the disturbance type, dimensions of disturbance and total proposed acres of disturbance.
- Photographs of equipment to be used and disturbance created by the equipment.
- Hard copy and electronic copies of an overview map that includes: title, MTRS, contours, scale, legend, land status, lease boundary, location of disturbance, existing and proposed roads, overland travel routes, point data for equipment, locations of staging and lay down areas, worker camps, location of water and gravel sources.
- Shape files with complete metadata including data projection, map author, and date of creation.
- Source of drill pad and road borrow material.
- Water source.
- Description of surface ownership including other surface managing agencies.
- Detailed description of the environmental protection measures and best management practices.
- Description of surface reclamation methods.

Recommended Project Documentation Submittal for Utilization Plan and Construction Permit

Checklist from BLM IM NV-2010-066; Recommended Project Documentation Submittal for Utilization Plan and Construction Permit. Provide the following information per 43 CFR 3272.11.

- Signed Sundry Notice (Construction Permit) requesting authorization to commence construction of a utilization facility.
- Description of all proposed structure and facilities, their size, location and function, including acreage of disturbance associated with each facility. Include a table summarizing the disturbance type, dimensions of disturbance and total acres of proposed disturbance.
- Describe facility operations including estimated total injection and production rates, estimated well flow rates, pressures and temperatures, net and gross electrical generation and interconnection with other utilization facilities.
- Hard copy and electronic copies of contour maps that includes: production and injection well pads, pipeline routes, facility locations, locations of staging and lay down areas, drainage structures and culverts, existing and proposed roads, overland travel routes, MTRS, scale, legend, land status, and lease boundaries.
- Description of site preparation and associated surface disturbance including the source for road building materials, amounts of cut and fill, drainage structures and culvert placement and design, analysis of all evaluation studies given for the site including hydrologic studies, geotechnical studies, etc. Description of additional tests, studies or surveys planned.
- The source, quality and proposed consumption rate of water to be used during facility operations and construction.
- The method for meeting air quality standards during facility construction and operations especially standards concerning non-condensable gases.
- Estimated number of personnel during construction and operation of the facility.
- Construction schedule.
- Schedule for testing the facility and well equipment and for the start of operations.
- Measures to be used to minimize visual impacts.
- Environmental protection procedures and best management practices.
- Final reclamation plan.

Recommended Project Documentation Submittal for Site License

Checklist from BLM IM NV-2010-066; Recommended Project Documentation Submittal for Site License. Provide the following information per 43 CFR 3273.15.

- Description of the boundaries of the land applied for, as determined by a certified licensed surveyor. Lands described should include all federal acreage necessary to utilize the geothermal resource including utilization facility, substations, cooling towers, repair and storage facilities, etc.
- Description of MTRS.
- Total acreage of the utilization facility.
- The filing fee for a site license application to be paid to the BLM District Office.
- A site license bond to BLM State Office (see 3273.19).
- Documentation that the lessee or unit operator accepts the siting of utilization facility, if the operator is neither the lessee nor the unit operator.

Recommended Project Documentation Submittal for Commercial Use Permit

Checklist from BLM IM NV-2010-066; Recommended Project Documentation Submittal for Commercial Use Permit. Provide the following information per 43 CFR 3274.11.

- Signed Sundry Notice requesting approval of commercial use permit.
- Design specifications and the inspection and calibration schedule of production, injection, and royalty meters.
- Diagram of the utilization site or individual well showing the location of each production and royalty meter. If the sales point is located off the utilization site, provide a generalized schematic diagram of the electrical transmission or pipeline system, including meter locations.
- Copy of the sales contract for the sale and /or utilization of geothermal resources.
- Description and analysis of reservoir, production and injection characteristics, including the flow rates, temperatures and pressures of each production and injection well.
- Schematic diagram of each production and injection well showing the wellhead configuration, including meters.
- Schematic flow diagram of the utilization facility, including interconnections with other facilities.
- Description of the utilization process.
- Safety provisions for emergency shutdown. Include a schedule for testing and maintenance of safety devices.
- Environmental and operational parameters that will be monitored during the operation of the facility and / or well(s).

Geothermal Operations Plan Checklist

§ 3261.12 What is an operations plan? An operations plan describes how you will drill for and test the geothermal resources covered by your lease. Your plan must tell BLM enough about your proposal to allow us to assess the environmental impacts of your operations. This information should generally include:	**Date Rec'd**	**Complete**	**Date Complete**	**Okay to Approve**
(a) Well pad layout and design;				
(b) A description of existing and planned access roads;				
(c) A description of any ancillary facilities;				
(d) The source of drill pad and road building material;				
(e) The water source;				
(f) A statement describing surface ownership;				
(g) Plans for surface reclamation;				
(h) A description of procedures to protect the environment and other resources; and				
(i) Any other information we may require.				

Geothermal Drilling Program Checklist

§ 3261.13 What is a drilling program? A drilling program describes all the operational aspects of your proposal to drill, complete and test a well. Send us:	**Date Rec'd**	**Complete**	**Date Complete**	**Okay to Approve**
(a) A detailed description of the equipment, materials, and procedures you will use;				
(b) The proposed/anticipated depth of the well;				
(c) If you plan to directionally drill your well, also send us: (1) The proposed bottom hole location and distances from the nearest section or tract lines;				
(2) The kick-off point;				
(3) The direction of deviation;				
(4) The angle of build-up and maximum angle; and				
(5) Plan and cross section maps indicating the surface and bottom hole locations;				
(d) The casing and cementing program;				
(e) The circulation media (mud, air, foam, etc.);				
(f) A description of the logs that you will run;				
(g) A description and diagram of the blowout prevention equipment you will use during each phase of drilling;				
(h) The expected depth and thickness of fresh water zones;				
(i) Anticipated lost circulation zones;				
(j) Anticipated reservoir temperature and pressure;				
(k) Anticipated temperature gradient in the area;				
(l) A plat certified by a licensed surveyor showing the surveyed surface location and distances from the nearest section or tract lines;				
(m) Procedures and durations of well testing; and				
(n) Any other information we may require.				

APPENDIX D: WIND PERMITTING CHECKLISTS

Project Management & Planning

- Identify your project goals and areas where you will need to hire an expert
- Make preliminary contacts with consultants
- Select your business structure, project manager and CEO
- Raise seed capital to hire experts and perform feasibility studies
- Identify risk factors and how to mitigate them
- Develop your project plan and timeline

Wind Resource Assessment

- Preliminary wind assessment
    - Review your site on state/county wind maps
    - Collect information from nearby monitoring sites
    - Estimate annual electricity production
    - Estimate economic feasibility
- Detailed site characterization
    - Research feasibility study grants and anemometer loan programs
    - Set up anemometers and other instruments
    - Consult with a wind modeling company (optional)
    - Collect, validate, and analyze data
    - Develop detailed production estimates and cash flow projections

Siting

- Site Assessment
    - Inspect site: How much open space is available? Are there substantial wind obstacles? What is the topography like?
    - How close are distribution and transmission lines?
    - Gain control of site for installation of anemometer through easement or land purchase
    - Investigate interconnection opportunities
    - Investigate site access
    - Design and initiate wildlife surveys
    - Discuss project with your neighbors

- Qualify your land's potential for wind energy
    - Create a wind rose
    - Calculate wind shear
    - Review setback and spacing requirements
    - Determine turbine layout

APPENDIX E: WIND DEVELOPMENT BLM INSTRUCTION MEMORANDUM

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
http://www.blm.gov

December 19, 2008

In Reply Refer To:
2800 (350) P

EMS TRANSMISSION 12/22/2008
Instruction Memorandum No. 2009-043
Expires: 09/30/2010

To: All Field Officials

From: Director

Subject: Wind Energy Development Policy

Program Area: Right-of-Way Management, Wind Energy.

Purpose: This Instruction Memorandum (IM) provides updated guidance on processing right-of-way applications for wind energy projects on public lands administered by the Bureau of Land Management (BLM).

Policy/Action: This IM updates and replaces the Wind Energy Development Policy (IM 2006-216), issued August 24, 2006, and the Interim Wind Energy Development Policy (IM 2003-020), issued October 16, 2002. In addition, this IM further clarifies the BLM Wind Energy Development policies and best management practices (BMPs) provided in the Wind Energy Development Programmatic Environmental Impact Statement (EIS) of June 2005. Issuance of this IM ensures BLM-wide consistency in the processing of right-of-way applications and the management of authorizations for wind energy site testing and development on the public lands. The initiation of any new planning effort to create, revise, or amend a BLM land use plan will comply with policy provided in this IM. Land use planning efforts already underway will be assessed on a case-by-case basis to determine any necessary modifications or amendments.

Inventory and Planning: The BLM Land Use Planning Handbook (H-1601-1) requires that land use planning efforts address existing and potential development areas for renewable energy projects, including wind energy (see H-1601-1, Appendix C, II. Resource Uses, Section E. Lands and Realty). The BLM encourages the development of wind energy within acceptable areas, consistent with the Energy Policy Act of 2005 and the BLM Energy and Mineral Policy (August 26, 2008).

In October 2003, the BLM initiated the preparation of a Wind Energy Development Programmatic EIS to address the impacts of the future development of wind energy resources on public lands. The Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) assisted the BLM in the preparation of the Programmatic EIS and provided an inventory assessment of wind energy resources on public lands in the Western United States. Appendix B of the Programmatic EIS includes wind resource potential maps for each BLM field office. The Programmatic EIS Record of Decision (ROD) addressed the amendment of individual BLM land use plans and established both policies and BMPs regarding the development of wind energy resources on BLM-administered public lands. The revised BLM wind energy policies and BMPs are included as Attachment 1 to this IM. Wind energy site testing and monitoring activities are typically in conformance with existing land use plans and, therefore, a land use plan amendment to address these activities is not likely to be necessary.

In cases where wind energy development proposals are not in conformance with an existing land use plan, it may be appropriate to amend the land use plan concurrently using the same analysis for the wind energy development proposal. Field offices with land use plans that were not amended by the Programmatic EIS Record of Decision may amend their plans at anytime by following the requirements under 43 CFR 1610.5-5. When considering a proposed plan amendment, field offices will tier to, or incorporate analysis from, the Programmatic EIS as appropriate under Chapter V of the BLM National Environmental Policy Act (NEPA) Handbook (H-1790-1).

All land use planning efforts initiated after the issuance of this IM will address wind resource potential, public concerns, and opportunities for wind energy development within the land use planning area consistent with

the BLM Land Use Planning Handbook (appendix C). Field offices will incorporate wind energy resource development potential in these planning efforts to facilitate the processing of future wind energy applications. The land use plan revision process will address the environmental and public concern issues associated with commercial wind energy development. This will provide an opportunity to potentially reduce the amount of additional environmental review and documentation required to process a specific application in the future.

Information on wind energy resources is available at www.energyatlas.org. In addition, wind resources information is also available from the Department of Energy site at www.eere.energy.gov/windandhydro/windpoweringamerica/wind_maps.asp. Field offices are encouraged to use this information as the inventory base for land use planning.

Visual Resource Management (VRM)

The BLM Land Use Planning Handbook requires that VRM management classes be identified in land use plans based on inventories of visual resources as well as management considerations for other potential land uses (e. g., wind energy development). The VRM management classes may differ from VRM inventory classes based on the management priorities for land uses in an area. The VRM management classes are intended to establish landscape management objectives for a variety of surface disturbing activities. The VRM management classes are not intended to be used to exclude or preclude land uses, including opportunities for development of wind energy in areas with high wind energy resource potential.

Therefore, it is critical that when the BLM makes land use decisions it considers the attainability and manageability of VRM objectives relative to the wind energy resources and development potential and is consistent with our national energy priorities.

The VRM management class designations must be carefully considered in areas with high wind energy resource potential (wind power class 5 and above). This is especially important when considering the differences in resource management constraints relative to VRM Class II and Class III management classes in a planning area. The goal of the VRM program is to apply the basic principles of design of wind energy projects at the site-specific project level to mitigate or minimize visual resource impacts and meet VRM objectives established in the land use plan. In many cases, VRM management objectives designated at the land use planning level can be met through strategic placement of facilities and thoughtful design treatments that visually integrate the facilities into the landscape setting, thereby avoiding unnecessary land use plan restrictions. Performing Geographic Information Systems-based (GIS) viewshed analyses in areas of high wind energy resource potential and high visual resource values during land use planning can assist in determining suitability and compatibility between these resources, promote more integrated resource management, and avoid unwarranted exclusion and avoidance designations. Application of state-of-the-art digital terrain modeling and visual simulations as well as an integrated environmental design approach to project planning will go far to successfully integrate wind energy projects into the visual landscape. Conducting such analyses will provide the BLM with more objective criteria and defensible analysis to base VRM management class designations in the future. The BLM and wind energy operators will work collaboratively to seek creative ways to provide for renewable energy development while protecting visual resource values on the public lands.

Wildlife and Migratory Birds

In July 2003, the Fish and Wildlife Service (FWS) issued "Voluntary Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines." The guidelines are currently being reviewed by a Wind Turbine Guidelines Advisory Committee established under the Federal Advisory Committee Act (FACA) to provide further advice and recommendations to the Secretary of the Interior (Secretary) on effective measures to avoid or minimize impacts to wildlife and their habitats from wind energy facilities. The voluntary interim guidelines are not mandatory requirements in BLM land use plan decisions. Until the Secretary determines the applicability of final guidelines for the Department of the Interior (DOI) agencies, the FWS interim guidelines should only be used as a general guide to assist the BLM in siting decisions and the design of pre-development surveys, mitigation measures, and post-construction monitoring for site-specific projects.

The BLM Washington Office IM 2008-050 (December 18, 2007) provides interim guidance for Federal responsibilities under the Migratory Bird Treaty Act. This guidance addresses analysis of BLM land use planning decisions to avoid or minimize measurable negative impacts to migratory bird populations. The BLM guidance on migratory birds and the FWS guidelines may be used for site-specific wind energy projects to assist in developing mitigation measures for
avoiding or minimizing impacts to wildlife and avoiding or minimizing measurable negative impacts to

migratory birds. The BLM 6840 Manual also provides guidance on Special Status Species Management.

Areas of Critical Environmental Concern (ACEC)

The BLM will not issue right-of-way authorizations for wind energy development for areas in which wind energy development is incompatible with specific resource values. Specific lands excluded from wind energy site testing and monitoring and wind energy development include designated areas that are part of the National Landscape Conservation System (NLCS) (e.g., Wilderness Areas, Wilderness Study Areas, National Monuments, National Conservation Areas, Wild and Scenic Rivers, and National Historic and Scenic Trails). Wind energy development is permitted in one National Conservation Area, the California Desert Conservation Area (CDCA), in accordance with the provisions of the *California Desert Conservation Area Plan 1980.*

The Wind Energy Programmatic EIS established the previous policy that all ACECs were to be excluded from wind development. This IM changes this policy to ensure consideration of the purpose and specific environmental sensitivities for which the area was designated. All new, revised, or amended land use planning efforts will address and analyze ACEC land use restrictions individually, including restrictions to wind energy development. For future land use planning efforts, ACECs will not universally be excluded from wind energy site testing and monitoring or wind energy development but will be managed consistent with the management prescriptions for the individual ACEC. Existing land use plans and planning efforts may be amended as necessary, with appropriate level of NEPA analysis and decision, to address this change in wind energy and ACEC policy, consistent with the procedures of 43 CFR 1610.5.5. A site-specific land use plan amendment to address this change in policy may be addressed concurrently with the processing of a wind energy application. This revised policy will continue to provide protection of sensitive resource values in ACECs consistent with the management prescriptions for the individual ACEC.

Avoidance and Exclusion Areas

Land use plans may identify right-of-way avoidance areas or exclusion areas under the BLM land use planning guidelines (see Appendix C of the BLM Land Use Planning Handbook H-1601-1). Avoidance areas, as defined by the land use planning guidelines, do not preclude the issuance of rights-of-way for wind energy site testing and monitoring activities or wind energy development or preclude the issuance of permits, leases, or easements under Section 302 of the Federal Land Policy and Management Act (FLPMA). These uses in avoidance areas may be available with special stipulations or mitigation measures. For such authorizations, the area's environmental sensitivity and other feasible alternatives will be strongly considered.

Applications: All wind energy and wind energy-related facilities will be applied for under Title V of the FLPMA and Title 43, Part 2800 of the Code of Federal Regulations. The regulations cited in this IM refer to the right-of-way regulations which were published in the *Federal Register* on April 22, 2005, and became effective on June 21, 2005.
Wind energy site testing and monitoring facilities (meteorological towers) will not be authorized by a land use permit under the 43 CFR 2920 regulations but will be authorized as FLPMA rights-of-way. Geotechnical testing activities for foundation designs or other purposes will be authorized, however, by a land use permit under the 43 CFR 2920 regulations.

Applications for a wind energy right-of-way grant may be submitted for one of the following three types of wind energy projects:

1. A site-specific grant for individual meteorological towers and instrumentation facilities with a term that is limited to 3 years;
2. A project area grant for a larger site testing and monitoring area, with a term of 3 years that may be renewed consistent with 43 CFR 2807.22 and the provisions of this IM beyond the initial term of the grant; or
3. A development grant with a term that is not limited by the regulations, but will generally be for a term of 30 years.

Preapplication

Applications for any of the above projects will be submitted using Form SF-299, Application for Transportation and Utility Systems and Facilities on Federal Land, consistent with the requirements of 43 CFR 2804.12. The BLM authorized officer will encourage wind energy applicants to schedule preapplication meetings (43 CFR 2804.10) with the BLM to:

- Assist in the preparation and processing of applications,

- Identify potential issues and conflict areas,
- Identify visual resource issues and define the viewshed area of the proposed project for visual resources modeling,
- Identify any environmental or cultural resource studies that may be needed,
- Assess public interest and concerns,
- Identify other authorized uses,
- Identify other general recreation and public uses in the area,
- Discuss potential alternative site locations, and
- Discuss potential financial obligations (cost recovery fees, rental, and bonding) that the applicant must be willing to assume.

Coordination

Early informal public contacts with local community leaders and other interested parties are important in increasing public awareness and avoiding potential conflicts, especially in areas where other uses exist on the public lands. The applicant is encouraged to meet jointly with the BLM and the state wildlife agency early in the process to facilitate coordination on potential wildlife issues. Upon determining that the application is complete, the BLM field office will initiate consultation with the Department of Defense (DOD) on potential military airspace conflicts for both site testing and monitoring applications and for wind development projects, consistent with interagency protocol procedures. The military protocol procedures and a listing of DOD points-of-contact (Regional Environmental Coordinators) for consultation purposes are provided at www.blm.gov/wo/st/en/prog/energy/wind_energy.html. The BLM will initiate the consultation with the DOD within 30 days after receipt of a complete wind energy right-of-way application. In addition, the applicant is encouraged to submit the required filings with the Federal Aviation Administration (FAA) as early in the application process as possible to identify any air safety and lighting measures that will be required for the project. In addition, after meteorological towers are authorized and constructed, the BLM will ensure the location of these towers are noted on aerial navigation hazard maps for low-level flight operations that may be undertaken by the BLM and other Federal or state agencies for fire operations, wild horse and burro census and gathers, wildlife inventories, facility maintenance, or other activities.

Fees

All wind energy right-of-way applications and authorizations are subject to appropriate cost recovery fees for processing and monitoring as well as rental fees as required by 43 CFR 2804.14, 43 CFR 2805.16, and 43 CFR 2806.10. The policy guidance on rental fees contained in this IM is based on comparable payment practices for existing wind energy right-of-way authorizations on Federal and non-Federal lands. Wind energy right-of-way authorizations are considered non-linear right-of-way grants and, therefore, are not subject to the requirements of 43 CFR 2806.23 regarding multiyear rental payments. However, by policy, the holder of a wind energy site testing and monitoring right-of-way grant may pay the required rental fee for the entire term of the grant in advance.

Processing Timeframes

Right-of-way applications for wind energy site testing and monitoring or wind energy development projects will be identified as a priority field office workload and will be processed in as timely a manner as possible. The processing time frames for right-of-way applications as required by 43 CFR 2804.25 will be followed for all wind energy applications. Site testing and monitoring right-of-way applications should be processed within a 60-day time frame, consistent with the requirements of 43 CFR 2804.25. The regulations require that the authorized officer notify the right-of-way applicant in writing if processing will take longer than 60 days, the reasons for the delay, and an estimate of the time frame for processing the application. The BLM Washington Office, Land, Realty and Cadastral Survey Division (WO-350) may be able to assign a right-of-way project manager, if requested by the state director, to coordinate the processing of any major wind energy development right-of-way application.

Authorizations:

1. Site-specific Grant for Testing and Monitoring:

A site-specific FLPMA right-of-way grant (Form 2800-14) will be used to authorize individual meteorological towers and instrumentation facilities. The area authorized for these facilities will be the minimum necessary for construction and maintenance of the temporary facility and any access required to the site. The term of a site-specific right-of-way grant will be limited to
3 years from the date of issuance. A site-specific right-of-way grant will not be renewed beyond this term. A new right-of-way application will be required if the holder of the site-specific right-of-way grant wishes to

continue monitoring at the site. Numerous site-specific right-of-way grants for wind energy site testing and monitoring may be issued to various right-of-way holders in the same area and do not establish any exclusive or preferential rights regarding future wind energy development. In addition, the BLM retains the right to authorize other compatible uses of the public lands in the area.

Rent: The rental fee for a site-specific right-of-way grant for wind energy site testing and monitoring will be a minimum of $100 per year for each meteorological tower or instrumentation facility location and includes no additional rental fee for the acreage of each site location. Some BLM field offices have existing site-location rental fees for temporary facilities on the public lands that can be used for wind energy site testing and monitoring facilities. In some cases these fees will exceed the minimum $100 per year fee. The rental fee for a site testing and monitoring right-of-way grant is paid annually, in advance, on a calendar-year basis consistent with the regulations (43 CFR 2806.12). However, by policy, the holder of a site-specific right-of-way grant may pay the required rental fee for the entire term of the grant in advance.

Grant Administration: Each site-specific site testing and monitoring authorization will contain appropriate BMPs and may contain appropriate site-specific stipulations, including but not limited to road construction and maintenance, vegetation removal, and number and location of wind monitoring sites. A bond will be required for site testing and monitoring authorizations to ensure compliance with the terms and conditions of the authorization. A minimum bond in the amount of $2,000 per meteorological tower will be required for all authorizations. The amount of the reclamation bond may include potential reclamation and administrative costs to the BLM.

The wind inventory data collected and held by the right-of-way grant holder is proprietary information, will be protected by the Privacy Act, and may be withheld under the Freedom of Information Act to the extent allowed by Federal law.

Site testing and monitoring authorizations may be assigned consistent with the provisions of the regulations (43 CFR 2807.21). However, all assignments must be approved by the BLM authorized officer and the qualifications of all assignees must comply with the Due Diligence section of this IM and the requirements of the regulations (43 CFR 2804.12(a)(5) and 43 CFR 2804.26(a)(5)).

2. Project Area Grant for Testing and Monitoring:

A FLPMA right-of-way grant (Form 2800-14) that includes provisions for renewal beyond the 3-year term (43 CFR 2807.22) will be used to authorize wind energy site testing and monitoring facilities for a project area and the access required to the project area and facilities. A project area as used in this IM describes an area of land where wind resource information is being collected to determine the wind energy resource potential of the area. The holder of the project area grant retains an interest in the site testing and monitoring project area, but will be required to submit a separate right-of-way application (43 CFR 2807.20) and Plan of Development (POD) to the BLM for review, analysis, and separate approval for any future wind energy development proposal. The interest retained by the holder of the project area grant is only an interest to preclude other wind energy right-of-way applications during the 3-year term of the grant. The lands within the grant area will not be available for other wind energy right-of-way applications. The holder of the project area grant establishes no right to development and is required to submit a separate right-of-way application for wind energy development to the BLM for analysis, review, and decision. The BLM retains the right to authorize other compatible uses of the public lands.

Acreage: The lands involved in the project area grant will be defined by aliquot legal land descriptions and configured to involve a reasonable amount of land to support a possible right-of-way application for a wind energy development project in the future. There are no statutory or regulatory limits on the acreage of a site testing and monitoring right-of-way application; however, the BLM may request additional information from the applicant to determine if the project area is a reasonable size for a potential wind energy development project in the area. The BLM may request general information on the potential wind resources of the area, the potential project size and megawatt capacity of the area, and the potential project development configuration and limitations to assist in determining whether the application is of a reasonable size. Applicants seeking large acreage sites should be advised that the BLM will require those applicants to provide rationale describing how they would potentially develop such large acreage. The BLM is not required to accept applications that are not in the public interest; however, BLM field offices will not inappropriately limit the size of project areas that may be needed to evaluate an area for potential wind energy development. Any amendments to site testing and monitoring right-of-way authorizations that would add additional acreage to the authorization would still be limited to the 3-year term of the initial grant.

Site Testing: To assess the wind resource development potential of a project area, an applicant is not required to place site testing and monitoring facilities (meteorological towers) on every parcel of public land involved in

a project area in order to adequately assess the wind resources of a project area on public lands. In some cases, an applicant may propose to place meteorological towers on adjacent private, state, or other land without any meteorological towers on public land.

The BLM Washington Office has a funding agreement with the DOE's NREL. Any BLM field office may request the NREL to assist in evaluating the applicant's proposal for the siting and number of meteorological towers. In order for NREL to evaluate the proposal, the field office must submit the following information to NREL: a topographic map of the area showing the boundary of the proposed project area, land ownership, proposed location and height of the meteorological towers, and proposed access roads. The BLM Land, Realty and Cadastral Survey Division (WO-350) can provide the point-of-contact at NREL for these evaluations.

If the evaluation determines that the meteorological tower placement on adjacent non-Federal land is capable of characterizing the wind patterns on public lands, then a NEPA document will be prepared describing the Federal action as the issuance of a right-of-way grant with limited activities on the public land. If the evaluation concludes that the proposal cannot adequately assess the wind patterns on public lands or the project area proposed is not consistent with good wind testing techniques, then the applicant will be notified of this finding and given the opportunity to amend the proposal. If the proponent does not amend the application, the BLM authorized officer may reject the application.

In cases where a right-of-way grant is issued for a project area and no meteorological towers are installed on public lands, the Due Diligence section of this IM requires the proponent to install the meteorological towers on the non-Federal land within 12 months from the effective date of authorization. The holder will provide the BLM with good cause as to the nature of any delay. The purpose of the Due Diligence provisions of the IM are to preclude land speculators from obtaining a right-of-way grant for a project area with valuable wind energy resources that would preclude other applicants with serious interests in the potential development of wind energy on the public lands.

Renewal: The right-of-way grant for a project area is issued for an initial term of 3 years from the date of issuance. This term can be renewed (43 CFR 2807.22) for a term not to exceed 3 years if a separate rightâ€ofâ€way application and POD is submitted for a wind energy development project prior to the end of the initial term of the site testing and monitoring grant. A request for renewal authorization must be submitted 120 days before the end of the term of the grant (43 CFR 2807.22). However, the development right-of-way application and POD are not required to be submitted until just prior to the end of the term of the site testing and monitoring authorization. The request for renewal should be carefully reviewed to determine if the acreage requested may be reduced to reflect the area proposed for the wind energy development project.

The holder of the site testing and monitoring right-of-way grant should be advised that appropriate environmental and geotechnical studies and inventory information should be collected in conjunction with the wind energy site testing and monitoring studies during the 3-year term of the initial grant. The grant holder is required to submit a study design strategy to the BLM for review and comment in advance to ensure the environmental studies are of sufficient detail and scope for the project area. The data gathered is an integral part of preparing the initial POD for a proposed wind energy development if an application is submitted in the future. Developers should begin the required environmental studies during the initial grant period and not wait until they submit an application for renewal of the site testing and monitoring authorization.

Plan of Development: The grant holder is required to submit, prior to the end of the initial term of the site testing and monitoring grant, a separate right-of-way development application and POD to retain the interest in the project area. The applicant is encouraged to schedule a preapplication meeting with the BLM prior to submittal. The pre-application meeting will provide an opportunity to discuss the environmental and sensitive issues that may be associated with the proposed wind energy development project, processing timeframes and environmental analysis and review procedures, cost recovery requirements, and potential mitigation measures that could be included in the POD.

Concurrent submittal of a POD with the right-of-way application for the wind energy development project is consistent with the provisions of 43 CFR 2804.25. The BLM will not accept a POD that is simply a conceptual plan of development and must be of sufficient detail to provide the basic information necessary to begin the environmental analysis and review process for the proposed wind energy development project. Attachment 2 provides an outline of the minimum requirements for the initial POD.

The initial wind energy POD must be submitted prior to the end of the 3-year term of a site testing and

monitoring authorization. If the initial POD is incomplete, the wind energy right-of-way applicant will be contacted by letter and must provide a complete POD consistent with the POD requirements to the BLM within 90 days. If the applicant has not responded within
90 days, or if the applicant has responded and the information provided is not sufficient, the BLM will send a 30-day show-cause letter to the applicant prior to issuing any decision to reject the application for failure to respond pursuant to the regulations (43 CFR 2804.25(b) and 2804.26(a)(6)). During the NEPA review process, additional information may be requested of the applicant. The BLM will provide the applicant reasonable periods of time to respond to these requests for additional information.

Rent: The rental fee for a project area grant will be based on the total public land acreage of the project area included in the right-of-way grant. The rental fee for the total public land acreage of the grant will be $1,000 per year or $1 per acre per year, whichever is greater. This rental fee is based on comparable fees on non-Federal lands and is consistent with the limited use of the land. There is no additional fee for the installation of each meteorological tower or instrumentation facility located within the site testing and monitoring project area. This rental fee is based on the value of the use of the area for site testing and monitoring and the value of the option held by the holder that precludes other wind energy right-of-way applications during the 3-year term of the grant, comparable to similar option payments on private lands. The rental fee for a site testing and monitoring right-of-way grant is paid annually, in advance, on a calendar-year basis consistent with the regulations (43 CFR 2806.12). However, by policy, the holder of a site testing and monitoring right-of-way grant may pay the required rental fee for the entire term of the grant in advance.

Grant Administration: Each project area grant will contain appropriate BMPs and may contain appropriate site-specific stipulations, including but not limited to road construction and maintenance, vegetation removal, and number and location of wind monitoring sites. A bond will be required for site testing and monitoring authorizations to ensure compliance with the terms and conditions of the authorization. A minimum bond in the amount of $2,000 per meteorological tower will be required for all authorizations. The amount of the reclamation bond may include potential reclamation and administrative costs to the BLM.

The wind inventory data collected and held by the right-of-way grant holder is proprietary information, will be protected by the Privacy Act, and may be withheld under the Freedom of Information Act to the extent allowed by Federal law. However, general wind resource information must be provided to the BLM, at the time a separate right-of-way application for development is submitted, to support the environmental analysis and review of the proposed development. This information becomes public information to the extent allowed by Federal law and will be used for analysis and decision-making purposes related to the processing of the right-of-way application for a wind energy development project. Biological and cultural resource studies and data collected by the right-of-way grant holder and provided to the BLM will become public information to the extent allowed by Federal law.

Site testing and monitoring authorizations may be assigned consistent with the provisions of the regulations (43 CFR 2807.21). However, all assignments must be approved by the BLM authorized officer and the qualifications of all assignees must comply with the Due Diligence
section of this IM and the requirements of the regulations (43 CFR 2804.12(a)(5) and 43 CFR 2804.26(a)(5)). A partial assignment of a site testing and monitoring authorization will not be approved if such action would hinder the BLM management of the authorization or the associated public lands.

3. Development Grant:

A FLPMA right-of-way grant (Form 2800-14) will be used to authorize all facilities held by the holder of the grant on the public lands related to a commercial wind energy development project. This authorization will include the wind turbine facilities as well as the onsite access roads, electrical and distribution facilities, and other support facilities authorized by the wind energy development right-of-way grant. Other offsite facilities, such as electrical transmission and additional access roads, may require a separate linear right-of-way authorization. The lands involved in the development grant will be defined by aliquot legal land descriptions and be configured to minimize the amount of land involved, while still allowing an adequate distance between turbine positions and reasonable right-of-way boundaries. In the absence of any specific local zoning and management issues, no turbine will be positioned closer than 5 rotor-diameters from the center of the wind turbine to the right-of-way boundary in the dominant upwind or downwind direction to avoid potential wind turbulence interference issues with adjacent wind energy facilities unless it can be demonstrated that site conditions, such as topography, natural features, or other conditions such as offsets of turbine locations, warrant a lesser distance. Further, for safety reasons, no turbine on public land will be positioned closer than 1.5 times the total height of the wind turbine to the right-of-way boundary. In cases where the applicant holds a long-term lease right on adjacent Federal or non-Federal lands for wind energy development or the adjacent non-Federal landowner provides a setback waiver, these minimum setbacks may be eliminated, allowing turbines to be placed closer to the right-of-way boundary.

The right-of-way holder should be encouraged, through terms and conditions of the right-of-way authorization, to work with the BLM to increase the public awareness of the benefits of wind energy development by providing information and public points-of-access near the development where safe and appropriate. These measures may include onsite interpretive resources and photo locations. The BLM and right-of-way holder may provide a positive message on the responsible use of renewable resources and the multiple resource uses of the public lands.

Rent: The rental fee for a development grant has been updated from the fee originally established by the Interim Wind Energy Development Policy in October 2002. The new rental fee established by this IM is $4,155 per megawatt of the total anticipated installed capacity of the wind energy project on public land based on the approved POD, a capacity factor of 30 percent, a Federal rate of return of 5.27 percent, and an average purchase price of $0.03 per kilowatt hour. The Federal rate of return is based on the 10-year average of the 30-year Treasury bond yield (January 1998 to January 2008). The rental fee is a fixed annual BLM-wide rent based on the following formula:

Annual rent = (Anticipated total installed capacity in kilowatts on public land as identified in the approved POD) x (8760 hours per year) x (30 percent capacity factor) x (5.27 percent federal rate of return) x ($0.03 average price per kilowatt hour).

Example for one megawatt (1,000 kW) of anticipated total installed capacity on public land:

Annual rent = (1,000 kW) x (8760 hours) x (0.30 capacity) x (0.0527 rate of return) x ($0.03 per kWh) or $4,155 per megawatt of anticipated total installed capacity on public land.

The annual rental fee will be phased in as follows:

First year - 25 percent of the total rental fee or $1,039 per megawatt
Second year - 50 percent of the total rental fee or $2,078 per megawatt
Third year - 100 percent of the total rental fee or $4,155 per megawatt

The full annual rental fee will apply at any time prior to 3 years upon the start of commercial operations of the project. The rental fee is paid annually, in advance, on a calendar-year basis consistent with the regulations (43 CFR 2806.12). The BLM will not assess a separate turbine installation fee (an additional one-time payment for each turbine installation), a production rental fee, or other fees as part of the wind energy rental fee. Any separate linear right-of-way authorizations issued for offsite facilities to support the wind energy project, such as electrical transmission lines, will be subject to the linear right-of-way rental provisions of 43 CFR 2806.20.

All wind energy right-of-way holders are subject to rent in accordance with this IM, unless they are specifically exempt from rent by statute or regulation. Some holders or facilities may be exempt from rent pursuant to the Rural Electrification Act of 1936, as amended (43 CFR 2806.14(d)).

Grant Administration: The term of a development grant is not limited by the regulations; however, the terms of most existing grants for major wind energy development projects recognize the overall costs and useful life of wind energy facilities and are generally for a term of 30 years. The grant may be renewed for additional terms, consistent with the provisions of the regulations (43 CFR 2807.22). The BLM also retains the right to authorize other compatible uses of the public lands within the right-of-way grant during the term of the grant.

A bond will be required for all development grants to ensure compliance with the terms and conditions of the right-of-way authorization and the requirements of applicable regulatory requirements. The amount of the bond may include potential reclamation and administrative costs to BLM. A minimum bond in the amount of $10,000 per wind turbine, considering salvage values of turbines and towers, will be required for all wind energy development projects on public lands. However, the amount of the required bond will be determined during the right-of-way authorization process on the basis of site-specific and project-specific factors. Acceptable bond instruments include cash, cashier's or certified check, certificate or book entry deposits, negotiable U. S. Treasury bonds equal in value to the bond amount, or surety bonds from the approved list of sureties (U. S. Treasury Circular 570) payable to the Bureau of Land Management. A letter of credit is not an acceptable form of bond. All bonds will be periodically reviewed (at least every 5 years) by the BLM authorized officer to ensure adequacy of the bond.

The development grant may be assigned consistent with the provisions of the regulations (43 CFR 2807.21). However, all assignments must be approved by the BLM authorized officer and the qualifications of all assignees must comply with the Due Diligence section of this IM and the requirements of the regulations (43 CFR 2804.12(a)(5) and 43 CFR 2804.26(a)(5)). A partial assignment of the grant will not be approved if such

action would hinder the BLM management of the authorization or the associated public lands.

All final decisions issued by the authorized officer in connection with the authorization of any of the above described wind energy projects are appealable under 43 CFR Part 4 (43 CFR 2801.10). It should also be noted that right-of-way grants are issued as full force and effect decisions (43 CFR 2801.10(b)) and will remain effective during any appeal period, unless stayed by the Interior Board of Land Appeals (IBLA).

Competitive Interest: The right-of-way regulations (43 CFR 2804.23(c)) provide authority for identifying public lands under competitive bidding procedures for wind energy right-of-way authorizations. However, the BLM will only initiate a competitive process if a land use planning decision has specifically identified an area for competitive wind energy leasing. The Programmatic EIS and associated ROD did not identify any competitive wind energy leasing areas for any BLM land use plans; therefore, any competitive leasing areas would need to be identified through a local land use planning process. Site testing and monitoring or wind energy development right-of-way applications will be processed, therefore, on a first-come basis. The BLM will encourage applicants who may have an interest in a common area to establish a partnership or cooperative agreement that establishes compatible use of the site among the applicants. If the applicants choose not to form a partnership or cooperative agreement, the BLM will proceed to process the first complete application with attached cost recovery fees required by 43 CFR 2804.14.

Due Diligence: There are some concerns regarding the potential for land speculators to obtain right-of-way grants and control valuable wind energy resource areas that would preclude other applicants with serious interests in the potential development of wind energy on the public lands. These concerns can be mitigated by applying the applicant qualification requirements of the regulations (43 CFR 2804.12(a)(5) and 43 CFR 2804.26(a)(5)) and requiring certain due diligence provisions in the right-of-way authorization for site testing and monitoring or wind energy development.

Technical and Financial Capability

The regulations provide authority to require the application to include information on the applicant's technical capability to construct, operate, and maintain the wind energy facilities and associated transmission facilities (43 CFR 2804.12(a)(5)). This technical capability can be demonstrated by international or domestic experience with wind energy projects or other types of electric energy-related projects on either Federal or non-Federal lands. The applicant should provide information on the availability of sufficient capitalization to carry out development, including the preliminary study phase of the project, as well as the site testing and monitoring activities. Actual development or ownership of similarly-sized wind energy facilities or other types of electric energy-related facilities within the last 5 years by the applicant would generally constitute evidence of financial capability. However, applicants in bankruptcy or other related financial difficulties may not be able to meet the due diligence provisions of the right-of-way authorization. Attachment 2 provides an outline of the information to include in the POD, which requires the submittal of information on the financial and technical capability of the applicant. The regulations provide the authority to deny the application if the applicant cannot demonstrate adequate technical ability to construct, operate, and maintain the wind energy facilities (43 CFR 2804.26(a)(5)).

Terms and Conditions

Due diligence is encouraged by the limited 3-year term of the site testing and monitoring right-of-way authorization. The project area grant can only be renewed if a separate right-of-way application and POD is submitted for a wind energy development project prior to the end of the initial term of the project area grant. In addition, the site testing and monitoring authorization and the wind energy development authorization will include a due diligence requirement for installation of facilities consistent with an approved POD.

The following due diligence requirements must be included in the terms and conditions of either the site testing and monitoring authorization or the wind energy development authorization:

- If monitoring facilities under a site testing and monitoring right-of-way authorization have not been installed within 12 months after the effective date of the authorization or consistent with the timeframe of the approved POD, the holder will provide the BLM good cause as to the nature of any delay, the anticipated date of installation of facilities, and evidence of progress toward site monitoring activities.
-
- If construction of wind energy facilities under a wind energy development authorization has not commenced within 2 years after the effective date of the grant or consistent with the timeframe of the approved POD, the right-of-way holder will provide the BLM good cause as to the nature of any delay, the anticipated date of construction, and evidence of progress toward commencement of construction.

Failure of the holder to comply with the due diligence terms and conditions of either the site testing and monitoring authorization or the wind energy development authorization provides the authorized officer the authority to terminate the authorization (43 CFR 2807.17). The rental fee provisions outlined in this IM also mitigate, to some extent, the concerns regarding due diligence.

Environmental Review: The Programmatic EIS addressed a range of alternatives including the proposed action that would implement a wind energy development program with the establishment of a set of policies and BMPs for wind energy development on the public lands. In accordance with this IM, the BLM is clarifying some of the policies and BMPs established in the Programmatic EIS. In particular, ACECs will not be universally excluded from wind energy site testing and monitoring or wind energy development but will be managed consistent with the management prescriptions for the individual ACEC. Consistent with the analysis in the Programmatic EIS, this revised policy will continue to provide protection of sensitive resource values in ACEC areas and will not result in effects outside the range of effects analyzed in the Programmatic EIS.

The revised policies and BMPs are included in attachment 1 of this IM and are applicable to all wind energy activities on BLM-administered public lands. The BMPs establish environmentally sound and economically feasible mechanisms to protect and enhance natural and cultural resources. They identify the issues and concerns that need to be addressed by project-specific plans. Mitigation measures protecting these resources will be required to be incorporated into the project POD. These mitigation measures will include the specific programmatic BMPs as well as additional mitigation measures contained in other existing and relevant BLM guidance or stipulations developed to address site-specific or species-specific concerns through project-level analysis.

To the extent that the Programmatic EIS addresses anticipated issues and concerns associated with an individual wind energy project, including potential cumulative impacts, the BLM will, by policy, tier off of the analysis in the Programmatic EIS and limit the scope of additional project-specific NEPA analyses. The site-specific NEPA analyses will include analysis of project site configuration and micrositing considerations, monitoring program requirements, and appropriate site-specific stipulations. In addition, offsite compensatory mitigation may be appropriate to consider for some projects consistent with BLM offsite mitigation policies (see IM 2008-204 dated September 30, 2008).

1) Site-specific or Project Area Applications: The scope of the environmental analysis required for either a site-specific application or a project area application includes direct, indirect, and cumulative effects of the proposed site testing and monitoring-related facilities. The site testing and monitoring right-of-way authorization is for a limited term (3 years) and usually includes only a few wind monitoring towers with instruments attached to measure various meteorological parameters such as wind speed, wind direction, and temperature at various heights above the ground. The footprint for each monitoring tower is small and the need for site clearances should be limited to the areas of proposed surface disturbance and associated areas of potential effect. Some newer technologies using sonar equipment are also being used to collect wind data. This type of equipment also has a small footprint and requires little or no surface disturbance.

The environmental review should not address wind energy development facilities, as the installation of wind turbines are not proposed during site testing and monitoring. The environmental review of wind energy development facilities will occur at the point in time when a wind energy development application is submitted. The reasonably foreseeable development discussions in the environmental analysis for a site testing and monitoring right-of-way application should focus on anticipated installation of additional wind monitoring facilities during the term of the right-of-way grant. Typically only a small number of wind energy site testing and monitoring authorizations ever lead to actual wind energy development projects. Therefore, the reasonably foreseeable development discussion should not focus on uncertain future development scenarios. However, the cumulative impacts of other wind energy site testing activities and any other reasonably foreseeable activities that potentially impact the same environmental resources in the area are required to be addressed in the environmental analysis.

Categorical Exclusion: The use of a Categorical Exclusion (CX) for the issuance of short-term right-of-way authorizations may be applicable to site testing and monitoring activities or sites. The relevant CX as identified by the BLM NEPA Handbook, H-1790-1, Appendix 4, Section E. 19 (January 30, 2008), encompasses "issuance of short-term (3 years or less) rights-of-way or land use authorizations for such uses as storage sites, apiary sites, and construction sites where the proposal includes rehabilitation to restore the land to its natural or original condition." Although the authorization is for a project area, the use is limited to a small site with potentially short-term minimal impacts. The CX for "nondestructive data collection, inventory (including field, aerial, and satellite surveying and mapping), study, research and monitoring activities" may also be applicable to wind energy site testing and monitoring activities. However, these site testing and monitoring activities must be subject to sufficient review to determine if any of the extraordinary circumstances identified in the guidelines apply.

A project area authorization is limited in term to 3 years. Although a project area authorization may be renewed, the holder is required to submit a separate right-of-way application for any wind energy development project. The right-of-way regulations (43 CFR 2807.20) require that the application be submitted and processed consistent with the provisions of 43 CFR Subpart 2804 as a separate and distinct application. The right-of-way grant holder has established no right to development and is required to submit a separate application to BLM for analysis, review, and decision. The proposed wind energy development project will be evaluated upon the submittal of an actual application for the development project. *Alliance to Protect Nantucket Sound, Inc. v. United States Department of the Army*, 288 F. Supp.2d 64, 80 (D. Mass. 2003), *affd*, 398 F.3d 105 (1st Cir. 2005), supports the proposition that an authorization to collect wind data and an authorization to develop a wind energy development project are not "connected actions," as that term is defined at 40 CFR 1508.25. The court held that the Army's authorization of a data tower in Nantucket Sound does not automatically trigger the authorization for a wind energy project; that information from the data tower was not required for the wind energy project but may be used if available and relevant; and that the data tower's utility does not depend on the ultimate authorization of the wind energy project. A contrary decision was reached in *Blue Ocean Preservation Society v. Secretary of Energy*, 754 F. Supp. 1450 (D. Hawaii 1991), so it is advisable to consult with the Solicitor's Office in complex cases.

2) Development Application: The scope of the NEPA analysis and the compliance requirements with the Endangered Species Act, the National Historic Preservation Act, and other laws for a wind energy development right-of-way application will be broader than a site testing and monitoring application as the installation of wind turbines, access roads, and electrical transmission facilities will be addressed in the wind energy development NEPA analysis. However, the footprint of wind energy facilities is typically smaller than other types of energy production facilities. The level of site clearances should be limited to the areas of proposed surface disturbances and associated areas of potential effect, including the access roads to wind turbine locations as well as the electrical transmission and other support facilities. The wind energy development facilities, however, may extend over a large geographic area and have a broad area of influence. The potential impact from these facilities may, therefore, extend beyond the small footprint of the individual wind turbine locations and it may be necessary to provide setbacks from important natural resource areas.

The reasonably foreseeable development discussion in the environmental analysis for a wind energy development project should focus on the potential for installation of additional wind turbines and increased production and electrical transmission from the project area. In addition, the cumulative impacts of other wind energy projects and any other reasonably foreseeable projects that potentially impact the same environmental resources in the area are required to be addressed in the environmental analysis. Project-specific environmental analyses for wind energy development tiered to the analyses conducted in the Programmatic EIS allow the project-specific analyses to focus just on the critical, site-specific issues of concern. For this reason, tiering to the Programmatic EIS is the preferred approach when appropriate. Tiering to the Programmatic EIS would allow for the preparation of an Environmental Assessment (EA) for an individual action as long as the remaining effects of the individual action are not significant. The level of NEPA documentation necessary will be determined based on the context and intensity of the proposed action and how much analysis may be tiered to the Programmatic EIS. It may also be possible to combine the required environmental review process for a wind energy development project with applicable state or local environmental procedures for energy facility siting. This would both streamline the process and be consistent with Departmental policy on intergovernmental cooperation.

LR 2000 Data Entry: Commodity code 974 (Wind Energy Facilities) will generally be used with case type 285003 to identify wind energy site testing and development right-of-way applications and authorizations, and ancillary facilities that are authorized with the same grant as the wind facility. Commodity code 974 will not be used for ancillary rights-of-way (transmission lines and roads) that are authorized as separate grants. Action codes were also established in LR 2000 in September 2005 to track compliance with the customer service standards of the right-of-way regulations. These Action codes also apply to wind energy applications and authorizations. The Remarks section of LR 2000 for a wind energy site testing and monitoring case is required to identify the number of meteorological towers authorized and located on the public land. In addition, the Remarks section for a wind energy development case is required to identify the number of turbines and total MW capacity authorized and located on the public land.

Timeframe: This IM is effective immediately upon receipt. Pending applications will be processed consistent with the provisions of this IM. Existing wind energy right-of-way authorizations requiring amendments may include provisions of this IM. Any amendment of an existing wind energy right-of-way grant that includes an adjustment of rental provisions consistent with this IM will be effective at the next billing date after

the amendment is made.

Budget Impact: The application of this policy will have some impact on budget. However, wind energy right-of-way applications are subject to the cost recovery provisions of the regulations and most applications for a wind energy development right-of-way will probably meet the criteria for full reasonable costs (43 CFR 2804.14(b)). In addition, BLM monitoring activities are also subject to the cost recovery provisions of the regulations. Workload impacts should be clarified through the streamlined procedures identified by this IM and by the priority established for processing wind energy right-of-way applications. There is also a positive impact through the implementation of consistent procedures in the processing of wind energy rightâ€'ofâ €'way applications.

Background: As part of an overall strategy to develop a diverse portfolio of domestic energy supplies for our future, the National Energy Policy of 2001 and the Energy Policy Act of 2005 (Public Law 109-58, August 8, 2005) encourage the development of renewable energy resources, including wind energy. Section 211 of the Energy Policy Act established a goal that the BLM would approve 10,000 megawatts of non-hydropower renewable energy projects on the public lands by 2015. The development of wind energy will be an important contribution to that goal. The BLM Energy and Mineral Policy, signed by the Director on August 26, 2008, also recognizes that the public lands are an important source of the Nation's renewable energy resources, including wind energy.

The United States has significant potential for wind energy development, especially on Federal lands in the West. The Federal wind energy production tax credit, stateâ€'level tax credits, and other incentives, including renewable energy portfolio standards in several states, have generated a strong interest in commercial wind energy projects on BLM-administered public lands. Project proposals on public land will create a workload that demands a commitment of resources and a priority to the timely and consistent processing of right-of-way applications for wind energy site testing and monitoring activities and for commercial wind energy development.

Manual/Handbook Sections Affected: This Instruction Memorandum and policy amends BLM Right-of-Way Management Manual 2801 and Handbook H-2801-1.

Coordination: This IM incorporates the policies and BMPs established by the Programmatic EIS and associated ROD. Preparation of the Programmatic EIS provided an opportunity for public comment and input on the proposed BLM wind energy program, policies, and BMPs as well as land use plan amendments. Preparation of this IM was coordinated with the Division of Decision Support, Planning and NEPA (WO-210), the Division of Fish, Wildlife and Plant Conservation (WO-230), and the Division of Recreation and Visitor Services (WO-250). The BLM state offices were also provided an opportunity to review the IM and provide input prior to finalization.

Contact: If you have any questions concerning the content of this IM, please contact Michael D. Nedd, Assistant Director, Minerals and Realty Management, at 202-208-4201, or your staff may contact the BLM Land, Realty and Cadastral Survey Division (WO-350). Points of contact for wind energy right-of-way questions include Rick Stamm, Realty Specialist, at 202-452-5185 and Ray Brady, Energy Policy Lead, at 202-557-3378.

Signed by:
Henri R. Bisson
Acting, Director

Authenticated by:
Robert M. Williams
Division of IRM Governance,WO-560

2 Attachments

1 – BLM Wind Energy Program – Policies and Best Management Practices (19 pp)
2 – Wind Energy Plan of Development (4 pp)

APPENDIX F: PLAN OF OPERATIONS VOLUNTARY CHECKLIST

This Plan of Operations (POO) outline/format was derived from the 43 CFR 3809 Surface Management Regulations, Section 43 CFR 3809.401. Your proposed POO must contain the following information and describe the operations at a level of detail sufficient for BLM to determine that the POO prevents unnecessary or undue degradation. BLM may request additional information throughout the processing period. The use of this outline/ format is recommended and should be used in conjunction with the 43 CFR 3809 regulations.

The Plan of Operations is to be filed in the BLM District or Field Office with jurisdiction over the land involved. The POO but must address the information required under 43 CFR 3809.401(b), as outlined below. This format has been prepared to assist operators in addressing the content requirements for a POO. This format includes both BLM and NDEP-BMRR, reclamation group, requirements. When submitting the same plan to both agencies, it is unnecessary to duplicate the same information in different locations throughout the document.

BLM File Serial Number: NVN -

Project Name:

1. Operator/Claimant Information

Operator Information

Operator Name:

Mailing Address:

Phone Number (Office, Cell, and FAX):

Tax Payer Identification Number of the Operator(s):

Point of contact, (when operator is a corporation):

Claimant/Claim Information (if different than operator information)

Claimant(s) Name:

Mailing Address:

Phone Number (Office, Cell, and FAX):

BLM Serial Number of unpatented mining claim(s) where disturbance would occur:

Primary Commodity (e.g. gold, silver, copper, turquoise, barite, etc.):

Claim Name(s):

Claim Type (Lode, Mill Site, Placer, etc.):

2. Description of Operations (i.e., Proposed Action)

Legal Description: Township, Range, section(s), quarter section(s)

County:

Descriptions of Operations: Must include detailed information or description for the BLM to be able to assess the proposed action for undue or unnecessary degradation to the public lands and analyze the proposal under the National Environmental Policy Act (NEPA). You only need to address those items applicable to your operations. This outline includes information for both a mining operation and an exploration project.

- Equipment: Provide a list or description of the equipment that will be used in the operations and its purpose.
- Devices: Provide a description of the devices that will be used in the operations and their purpose/use.
- Operating Practices: Include the type of action/operation or facility proposed, method or techniques proposed, applicable facility dimensions such as length, width, height, depth, capacity, diameter, slope degrees/percent slope, slope of natural terrain, mid-slope length, percent grade, acreages, tonnages, et.
- Mining operations: include all proposed surface and/or underground and processing facilities such as, but not limited to, open pit, decline, shaft, waste rock disposal facilities, mill, carbon columns, tailing impoundments, facility associated ponds and pipelines, heap leach pads, jig plant, etc.
- Ancillary Facilities: include all proposed facilities such as, but not limited to, structures (e.g. permanent, temporary, mobile, storage containers/tanks, roasters, autoclave, cooling towers, administrative buildings, dry houses, fuel bays, maintenance shops, wash bays, scales), utility needs (e.g. power, natural gas, generators), sanitation needs (e.g. septic system, sewage ponds), communication needs (e.g. buildings, telephone antennas, towers), fencing, diversion ditches, sediment control structures, signs, stockpiles, landfill, trash disposal, lay down areas, etc.
- Water needs and uses: include information such, but not limited to, as wells (e.g. type {water, piezometer, monitoring, injection} number of them), dewatering, rapid infiltration ponds, land application, reservoirs, ponds, water treatment, discharge methods and quantity, characterization data, etc.
- Access and other roads: include information such as, but not limited to, the type (haul, light vehicle, access), location(s), maintenance, upgrades, uses, temporary, permanent, etc.
- Hazmat: include information such as, but not limited to, type of generator, chemicals, fuel, quantities, disposal, storage, etc.

- Exploration operations: include all proposed activities such as, but not limited to, seismic surveys, trenching, drill pads, sumps, roads, material storage site, water source, pipelines, generator/pump, storage containers, number of drill holes that will be left open at any one time, number of drill rigs that will be on site at any one time, etc.

Maps of Project Area: Maps should be at an appropriate scale and show the location of exploration activities, drill sites, mining activities, processing facilities, waste rock and tailing disposal areas, support facilities, structures, buildings and access routes.

Electronic Maps: Where available, please provide electronic maps. However, IN ALL CASES, PLEASE SUBMIT A HARD COPY, which will serve as your OFFICIAL COPY. Please contact the local BLM field office to determine the appropriate format and standards.[1]

The Plan of Operations also includes the following information, which may or may not be the same information NDEP requires in the Water Pollution Control Permit:

- Preliminary or conceptual designs, cross sections, and operating plans for mining areas, processing facilities, and waste rock and tailing disposal facilities, which would include the as-built designs. Flow charts may be used to illustrate processes.
- Water Management Plans (Joint BLM and NDEP guidance under development)
- Rock Characterization and Handling Plans (Joint BLM and NDEP guidance under development): This includes waste rock characterization data and treatment of potentially acid generating (PAG) materials.
- Quality Assurance Plans (Joint BLM and NDEP guidance under development)
- Spill Contingency Plans (Joint BLM and NDEP guidance under development)
- Plans for all access roads, water supply pipelines, and power or utility services. This item also includes connected actions that may require right-of-way permit.
- General schedule of operations from start through closure:

Use and Occupancy: The following information must be included in the proposed Plan of Operations in order to comply with the 43 CFR 3715, Use and Occupancy Under the Mining Laws, when use or occupancy exceeds 14-days in a 90-day period. The definitions of terms are found in 43 CFR 3715.0-5. These regulations apply to public lands administered by the BLM.

A written description of the proposed occupancy that describes in detail: (See 43 CFR 3715.3-2)

(a) How the proposed occupancy is reasonably incident;

(b) How the proposed occupancy meets the conditions specified in §3715.2 and

[1] *When the operator chooses to submit AutoCad or other electronic formats for drawings and maps, they need to save their information into shapefiles, set the projections, and submit or email this information to the BLM. The projections need to be set to either NAD 83 and UTMs or NAD 27 and UTMs. When the operator is using ARCINFO for their drawings and maps, they need to just email or submit on a CD their export files that have been projected to either NAD 27 and UTMs or NAD 83 and UTMs*

§3715.2-1;

(c) Where you will place temporary or permanent structures for occupancy;

(d) The location of and reason you need enclosures, fences, gates, and signs intended to exclude the general public;

(e) The location of reasonable public passage or access routes through or around the area to adjacent public lands; and

(f) The estimated period of use of the structures, enclosures, fences, gates and signs, as well as, the schedule for removal and reclamation when operations end.

You must provide BLM with a detailed map that identifies the site and the placement of the items specified in (c), (d), and (e) of this section.

3. Reclamation Plan: A plan for reclamation to meet the standards in 3809.420, with a description of the equipment, devices, or practices you propose to use) See page 4 for detailed information to be included. One reclamation plan must be included in your submittal to the agencies that meets the requirements of both sets of regulations.

4. Monitoring Plan: Monitoring plans may incorporate existing State or other Federal monitoring requirements to avoid duplication. The scope of monitoring depends on the location and complexity of the operation. Generally, exploration activity may require some monitoring, while mining activities may require various levels of comprehensive monitoring plans.

The monitoring plan must be designed to meet the following objectives:

a) to demonstrate compliance with the approved plan of operations and other Federal and State environmental laws and regulations;

b) to provide early detection of potential problems; and

c) to supply information that will assist in directing corrective actions should they become necessary.

Where applicable, the monitoring plan must include: details on type and location of monitoring devices; sampling parameters and frequency; analytical methods; reporting procedures; and procedures to respond to adverse monitoring results. Examples of monitoring programs which may be necessary include surface- and ground-water quality and quantity, air quality, Revegetation, stability, noise levels, and wildlife mortality.

5. Interim Management Plan: Include a plan describing the management of the project area during periods of temporary closure, including periods of seasonal closure, to prevent unnecessary or undue degradation.

The interim management plan must include, where applicable, the following:

a) measures to stabilize excavations and workings;

b) measures to isolate or control toxic or deleterious materials (see also the requirements in §3809.420©(12)(vii) of the 43 CFR 3809 Regulations);

c) provisions for the storage or removal of equipment, supplies and structures;

d) measures to maintain the project area in a safe and clean condition;

e) plans for monitoring site conditions during periods of non-operation;

f) a schedule of anticipated periods of temporary closure during which you would implement the interim management plan, including provisions for notifying BLM and NDEP of unplanned or extended temporary closures; and

g) in cases of temporary or seasonal closure, you must provide adequate maintenance, monitoring, security, and financial guarantee, and BLM may require you to detoxification of process solutions.

In addition to Requirements 1-5, BLM may require you to supply:

- Operational and Baseline Environmental Information: The BLM may require information to use in analyzing potential environmental impacts as required by the National Environmental Policy Act and to determine if your plan of operations will prevent unnecessary or undue degradation.(see 43 CFR 3809.401(c))

For example, the BLM may request information on public and non-public lands needed to characterize geology, paleontological resources, cave resources, hydrology, soils, vegetation, wildlife, air quality, cultural resources, and socioeconomic conditions in and around the project area, as well as information that may require you to conduct static and kinetic testing to characterize the potential for your operations to produce acid drainage or other leachate.

The appropriate BLM Field Office will advise you on the exact type of information and level of detail needed to meet these requirements.

- Other information: if necessary, to ensure that your operations will comply with 43 CFR 3809.

6. Reclamation Cost Estimate: At a time specified by BLM, you must submit an estimate of the cost to fully reclaim your operations as required by 43 CFR 3809.552.

Nevada Reclamation Plan Outline

This outline is for a reclamation plan to meet the BLM standards at 43 CFR 3809.420 and requirements at 43 CFR 3809.401, and the State of Nevada requirements at NAC 519A.265 and 519A.270. This plan should include a description of the equipment, devices, or practices you propose to use, including, where applicable, plans for:

1. Drill hole plugging;
2. Regrading and reshaping *(Measures to control erosion, landslides, and water runoff);*
3. Mine reclamation, including information on the feasibility of pit backfilling that details economic, environmental, and safety factors;
4. Riparian mitigation;
5. Wildlife and fisheries habitat rehabilitation;
6. Handling and Application of Topsoil *(Saving of topsoil for final application after reshaping of disturbed areas have been completed);*
7. Revegetation;
8. Isolation, Removal, and/or control of acid-forming, toxic, or deleterious;
9. Removal or stabilization of buildings, structures and support facilities;
10. Post-closure management
11. Topographic map. The topographic map must show the area of the operation and depict:

    a) The boundaries of the area of the operation;

    b) Surface ownership of the land within the area of operation;

    c) The areas to be affected in sufficient detail so that they can be located from the ground;

    d) The kind of disturbances, including:

        1) Tailings impoundments;

        2) Leach pads;

        3) Waste rock dumps;

        4) Buildings

        5) Roads;

        6) Exploration roads, pads, trenches, and sumps;

        7) All other surface facilities; and

e) Is there previous disturbance within the project boundary? If "No," check here [ ] and move to 11f. If "Yes," continue with this section:

Land within the area of operation which was affected by:

1) An operation conducted by a previous operator and which is inactive on the date on the application for a permit for an operation is filed;

2) The current operator before January 1, 1981, and which is inactive on the date on which the application for a permit for an operation is filed;

3) The current operator before January 1, 1981, and which is active on the date on which the application for a permit for an operation is filed;

4) The current operator on or after January 1, 1981, but before October 1, 1990, and which is inactive on the date on which the application for a permit for an operation is filed; and

5) The current operator on or after January 1, 1981, but before October 1, 1990, and which is active on the date on which the application for a permit for an operation is filed.

f) The location of any surface water body within one-half-mile down gradient of the operation which may be impacted by excess sedimentation resulting from the mining operations.

g) Land within the operation is active on or after October 1, 1990; and

h) Access roads which were created before January 1, 1981.

12. Acreage disturbed. An estimate of the number of acres affected by each type of disturbance.

13. Prospecting and excavation techniques. A description of the techniques for prospecting and excavation to be used which will affect the surface.

14. Proposed productive post-mining use of the land.

15. Proposed schedule of the time for initiation and completion of activities for reclamation (including concurrent reclamation).

16. Proposed post-mining topography (Provide topographic map or cross-sections).

17. Technical criteria used to determine the final gradient and stability of slopes created or affected by the mining operation.

18. Proposed methods for concurrent reclamation.

19. Statement of reclamation constraints. A statement of any constraints on the estimated time to complete reclamation caused by the residual moisture content or physical or chemical qualities of impoundments.

20. Access roads. The kinds of access roads and their estimated width and length which

will be built and the manner in which they will be reclaimed.

21. Measures to minimize loading of sediment to surface waters during the operation and reclamation.

22. Proposed revegetation of the land for its post-mining land use including:

    a) A plan for the management of topsoil and growth medium;

    b) A list of each species of vegetation;

    c) The rate of seeding of vegetation;

    d) The type of fertilizer and mulch to be used; and

    e) When the planting will occur.

23. Proposed disposition of:

    a) Buildings;

    b) Equipment;

    c) Piping;

    d) Scrap;

    e) Chemicals and reagents;

    f) Fuel tanks and petroleum products; and

    g) Any other equipment and materials.

24. Description of any surface facilities such as buildings or roads which will not be reclaimed.

25. Description of any necessary monitoring and maintenance of fences, signs and other structures which will be performed by the operator on the reclaimed land.

26. Description of any reclamation which is necessary because of in-stream mining.

27. Effect the proposed reclamation will have on future mining in the area.

28. Effect the proposed reclamation will have on public safety.

29. Proposed methods for reclaiming any waste rock, ore, and other stock piles (include original underlying topography, operational slope, and proposed reclaimed slope);

30. Proposed methods for reclaiming any tailings impoundments and dams (including fluid management and disposal);

31. Proposed methods for reclaiming any heap-leach pads and ponds (including fluid management and disposal);

32. Proposed methods for reclaiming any open pit mines, including activities that will provide for public safety;

33. Proposed methods for reclaiming underground mines, including activities that will provide for public safety;

34. Operator statement agreeing to assume responsibility for the reclamation of the project.

35. Acknowledgements:

    a. This reclamation plan is consistent with the plan of operations.

    b. It is understood that approval of this reclamation plan does not constitute: (1) Certification of ownership to any person named Herein; and (2) Recognition of the Validity of any Mining Claim Herein.

    c. It is understood that approval of this plan does not relieve me of my responsibility to comply with any other applicable State or Federal laws, rules or regulations.

Reclamation Cost Estimate

BLM Case-File No.: NVN-

Project Name:

The reclamation cost estimate must cover the estimated costs as if BLM/NDEP were to contract with a third party to reclaim the operations according to the reclamation plan, including construction and maintenance costs for any treatment facilities necessary to meet Federal and State environmental standards.

1. The Cost of Equipment Rental, Operation and Labor Appropriate for the Geographic Area, or;
2. The Estimate of Cost from an Outside Contractor, or;
3. Any Other Method which is Acceptable to the Administrator, the BLM, the United States Forest Service or Another Federal Land Management Agency, if Appropriate.

Enter those values in the cost estimate that are appropriate to this project. This summary sheet is to be accompanied by a worksheet describing how each itemized cost was calculated. Attach sources/information used in cost estimate (examples: Caterpillar Performance Handbook, contractor's estimate, BLM state office procurement analyst, etc.).

A. Earthwork/Recontouring	Labor (1)	Equipment (2)	Materials	Total
Exploration	$	$	$	$
Exploration Roads & Drill Pads	$	$	$	$
Roads	$	$	$	$
Drill Hole Abandonment	$	$	$	$
Pits	$	$	$	$
Underground Openings	$	$	$	$
Process Ponds	$	$	$	$
Heaps	$	$	$	$
Waste Rock Dumps	$	$	$	$
Landfills	$	$	$	$
Tailings	$	$	$	$
Foundation & Buildings Areas	$	$	$	$
Yards, Etc.	$	$	$	$
Drainage & Sediment Control	$	$	$	$
Other**	$	$	$	$
Mobilization/Demobilization	$	$	$	$
Subtotal "A"	$	$	$	$

B. Revegetation/Stabilization	Labor (1)	Equipment (2)	Materials	Total
Exploration	$	$	$	$
Exploration Roads & Drill Pads	$	$	$	$
Roads	$	$	$	$
Drill Hole Abandonment	$	$	$	$
Pits	$	$	$	$
Underground Openings	$	$	$	$
Process Ponds	$	$	$	$
Heaps	$	$	$	$
Waste Rock Dumps	$	$	$	$
Landfills	$	$	$	$
Tailings	$	$	$	$
Foundation & Buildings Areas	$	$	$	$
Yards, Etc.	$	$	$	$
Drainage & Sediment Control	$	$	$	$
Other**	$	$	$	$
Subtotal "B"	$	$	$	$
C. Detoxification/Water Treatment/Disposal of Wastes**	**Labor (1)**	**Equipment (2)**	**Materials**	**Total**
Interim Fluid Management	$	$	$	$
Closure Plan Development	$	$	$	$
Process Ponds/Sludge	$	$	$	$
Heaps	$	$	$	$
Dumps (Waste & Landfill)	$	$	$	$
Tailings	$	$	$	$

C. Detoxification/Water Treatment/Disposal of Wastes**	Labor (1)	Equipment (2)	Materials	Total
Surplus Water Disposal	**$**	**$**	**$**	**$**
Monitoring	$	$	$	$
Other**	$	$	$	$
Subtotal "C"	$	$	$	$
D. Structure, Equipment and Facility Removal	**Labor (1)**	**Equipment (2)**	**Materials**	**Total**
Foundation & Buildings Areas	$	$	$	$
Other Demolition	$	$	$	$
Equipment Removal	$	$	$	$
Fence Removal	$	$	$	$
Fence Installation	$	$	$	$
Pipe & Culvert Removal	$	$	$	$

Powerline Removal	$	$	$	$
Transformer Removal	$	$	$	$
Rip-rap, rock lining, gabions	$	$	$	$
Other Misc. Costs	$	$	$	$
Other**	$	$	$	$
Subtotal "D"	$	$	$	$
E. Monitoring	**Labor (1)**	**Equipment (2)**	**Materials**	**Total**
Reclamation Monitoring and Maintenance	$	$	$	$
Ground and Surface Water Monitoring	$	$	$	$
Subtotal "E"	$	$	$	$
F. Construction Management & Support	**Labor**	**Equipment (2)**	**Materials**	**Total**
Construction Management	$	$	$	$
Road Maintenance	$	$	$	$
Other**	$	$	$	$
Subtotal "F"	$	$	$	$
G. Operational & Maintenance Costs	**Labor (1)**	**Equipment (2)**	**Materials (3)**	**Total**
Subtotal A through F	$	$	$	$
H. Indirect Costs				**Total**
1. Engineering, Design and Construction (ED&C) Plan (7)				
2. Contingency (8)				
3. Insurance (9)				
4. Bond (10)				
5. Contractor Profit (11)				
6. Contract Administration (12)				
7. BLM Indirect Cost (13)				
Subtotal Add-On Costs				
Grand Total				

RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES

1. Federal construction contracts require Davis-Bacon wage rates for contracts over $2,000. Wage rate estimates may include base pay, payroll loading, overhead and profit. To avoid double counting of any of the identified administrative costs the operator must itemize the components of their labor cost estimates or provide BLM with a signed statement, under penalty of USC 1001, that identifies what specific administrative costs are included in the quoted hourly rate.

2. The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the submitted Notice or approved Plan of Operations calls for drill holes to be plugged, but does not specifically require the

drill holes be plugged before the drill rig has been moved from the drill pad, the reclamation cost estimate must include the plugging cost for those drill holes. For all drill holes and wells scheduled to be left open, the estimated plugging cost must be included in the reclamation cost estimate. Where the approved Plan of Operations proposes immediate mining through an area where the drilling is to occur, and the cost of the post-mining reclamation is included in the reclamation cost estimate, the cost estimate does not need to include the plugging costs for those drill holes.

3. Miscellaneous items should be itemized on accompanying worksheets.

4. Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining proper fluid management to prevent overflow of solution ponds through premature cessation or abandonment of operations. Calculate a minimum six month direct cost estimate which includes power, supplies, equipment, labor and maintenance.

5. Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used, produced, or stored on the site.

6. Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid, minimize, rectify and reduce or eliminate the impact, or compensate for the impact.

7. Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To estimate the cost to develop an ED&C plan use 4.8% of the O&M cost. Calculate the ED&C cost as a percentage of the O&M cost as follows: up to and including $1 million, use 8%; over $1 million to $25 million, use 6%; and over $25 million, use 4%. Inclusion of a line item for the development of an ED&C plan may not be necessary for small operations, such as notice-level exploration. With small, uncomplicated reclamation efforts contracting may be able to proceed without developing an ED&C plan. [ED&C is automatically eliminated if "Notice" is selected on the Property Information Sheet]

8. A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the O&M cost as follows: up to and including $500,000, use 10%; over $500,000 to $5 million, use 8%; over $5 million to $50 million, use 6%; and greater than $50 million, use 4%. As with the ED&C cost, inclusion of a contingency cost may not be necessary for small operations, such as notice-level exploration.

9. Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit costs.

10. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is figured at 1.5% of the O&M cost. Enter the sum of both premium costs on this line.

11. For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.

12. To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a percentage of the O&M cost as follows: up to and including $1 million, use 10%; over $1 million to $25 million, use 8%; and greater than $25 million use 6%.

13. BLM's indirect cost rate is 21% of BLM's contract administration costs.

Additional Processing Information

Within 30 calendar days of receiving your proposed Plan of Operations, the BLM will review the submitted material and notify you: 1) that your Plan of Operations is complete, that is, it meets the content requirements under 43 CFR 3809.401(b); or 2) that your Plan does not contain a complete description of the proposed operations, specifying what information is missing or incomplete; or 3) that your Plan of Operations is complete, but BLM cannot process the Plan until certain additional steps are taken which could include you providing adequate baseline data, BLM conducting an environmental review, or BLM consulting with various entities such as the State or Indian tribes.

Once a Plan of Operations is determined to be complete, an environmental analysis is prepared. The environmental analysis and/or complete Plan of Operations is available for public comment for not less than 30-days. The processing of a Plan of Operations that requires preparation of an environmental impact statement (EIS) is subject to the cost recovery provisions of the regulations. BLM will notify you immediately if it is determined your Plan of Operations falls within the cost recovery requirements.

Upon completion of the review of your Plan of Operations, including environmental analysis, consultation, and consideration of public comments, the BLM will issue a decision that: 1) approves the Plan of Operations basically as submitted; or 2) approves the Plan of Operations subject to changes or conditions needed to prevent unnecessary or undue degradation; or 3) disapproves or withholds approval of the Plan of Operations, listing the reason for not approving the Plan. The decision to approve or deny a Plan of Operations can be appealed to the BLM State Director or directly to the Interior Board of Land Appeals (IBLA).

Even after receiving a decision approving your Plan of Operations, you must not begin surface disturbing activity until you have provided a financial guarantee in the amount of the approved reclamation cost estimate to the BLM State Office and have received a decision from that office that the financial guarantee has been accepted and obligated.

It should be noted that approval of a Plan of Operations by BLM does not constitute a determination regarding the validity or ownership of any unpatented mining claim involved in the operation. In addition, you are responsible for obtaining any use rights or local, state or federal permits, licenses or reviews that may be required for your operation.

Operations proposing the use and occupancy of the public lands, including full or part time residence or the construction, presence, or maintenance of temporary or permanent structures, exceeding the 14-90 day rule (43 CFR 3715.2), must also obtain concurrence under the regulations at 43 CFR 3715 that the use or occupancy is reasonably incident to prospecting, mining, or processing operations. This information is to be included in your proposed Plan of Operations per 43 CFR 3715.3-2. This concurrence or non-concurrence will be addressed in the Plan of Operations decision.

TECHNICAL REPORT
UCED 2010/11-03

BATTLE MOUNTAIN RETAIL SECTOR ANALYSIS

University of Nevada, Reno
Center for Economic Development

Battle Mountain Retail Sector Analysis

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January 2011

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This publication, *Battle Mountain Retail Sector Analysis,* was published by the University of Nevada Economic Development Center. Funds for the publication were provided by the Lander County Economic Development Authority under the Future Industrial Needs Discovery Project, and the United States Department of Commerce Economic Development Administration under University Centers Program contract #07-66-06415-01. This publication's statements, findings, conclusions, recommendations, and/or data represent solely the findings and views of the authors and do not necessarily represent the views of the Lander County Commissioners, the United States Department of Commerce, the Economic Development Administration, University of Nevada, Reno or any reference sources used or quoted by this study. Reference to research projects, programs, books, magazines, or newspaper articles does not imply an endorsement or recommendation by the authors unless otherwise stated. Correspondence regarding this document should be sent to:

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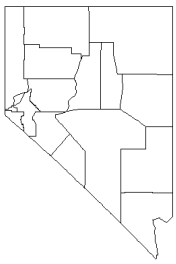

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Department of Resource Economics

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BATTLE MOUNTAIN RETAIL SECTOR ANALYSIS

"Where shopping flourishes, so do the communities that foster it. Where it fades, so do the economic prospects of the communities that lose it."

-National Council for Economic Development

During 2010, the University Center for Economic Development conducted an analysis of the retail sector in Lander County and Battle Mountain. An analysis of current retail sector trends and potential retail sector opportunities was supported by the Lander County Economic Development Authority under the Future Industrial Needs Discovery (F.I.N.D.) Project.

This report is divided into six sections. The first section provides an overview of national, state and county trends in the retail sector. The second section analyzes the needs and perspectives of Battle Mountain business operators. The third section investigates the needs and perspectives of Battle Mountain consumers. The fourth section completes a trade area analysis of downtown Battle Mountain. Section five provides an analysis of retail sector surpluses and leakages in downtown Battle Mountain. The final section develops and suggests strategies for Battle Mountain to capture retail sector sales in Battle Mountain.

SECTION I

NATIONAL, STATE, AND LANDER COUNTY RETAIL SECTOR TRENDS

SECTION I

NATIONAL, STATE AND LANDER COUNTY RETAIL SECTOR TRENDS

Overview

The primary objective of Section I is to provide analysis of the changing national, state and county retail sectors. Also, the changing position of downtown retail will be discussed. By understanding these retail sector changes, Lander County decision-makers may be able to better target or position local retail sector development activities to take advantage of these national, state and county trends.

Section I is divided into seven sub-sections. The first sub-section discusses the different types of retail businesses that exist currently in the nation and their influence on contemporary and future retail sector trends. The second sub-section presents, in bullet form, trends in the national retail sector. The third sub-section presents, in bullet form, state of Nevada retail sector trends. The fourth sub-section presents, in bullet form, trends in Lander County's retail sector. The fifth sub-section discusses small town downtown market trends. The sixth sub-section of Section I presents, in bullet form, a summary of research findings pertaining to rural retail sector activity and opportunities. The final sub-section of Section I presents, in bullet form, a summary of impacts from large retail stores on rural commercial trade.

The Changing Structure of the Retail Sector

During the 1980s and 2000s, structure of the national retail sector changed more rapidly than during the period from the 1950s to 1970s. Shopping malls became powerful attractions and fundamentally changed shopping patterns. Retail sector consumers abandoned downtown shopping areas in large numbers and shopped in malls (usually in suburban areas) where the climate was controlled, there was plenty of free parking, there were gigantic anchor stores, lots of specialty stores, and convenient shopping hours all under one roof. In fact, shopping at large malls has become a tourism activity for many vacationers.

Most downtown areas did not respond in a competitive way to these suburban malls. Many downtown areas left parking meters in place, continued to close at 5:00 or 5:30 p.m., continued to allow store workers to park in front of the store, and in general, had very little coordination or cooperation in establishing policies or -+a central community shopping area and meeting place, and are evolving into a blend of

service type businesses such as real estate offices, lawyers, accountants, insurance agents, and a small mix of retailers.

During the late 1980s and 2000s, the national retail sector has realized rapid growth in several segments. These segments are discount general merchandisers, membership warehouse clubs, "category killer" stores, factory outlet malls, specialty mail order, and Internet stores.

Discount General Merchandise Stores

Discount general merchandisers encompass such national chains as Walmart, K-Mart, and Target, as well as several regional chains such as Shopko. These stores range in size from 30,000 to 140,000 square feet, depending on the age of the store and market area served. These stores typically have 30 or more departments and relatively low prices due to a lower level of service than traditional department stores, and they continued to improve their operating efficiency. Discount general merchandisers usually carry 40,000 to 80,000 "stock keeping units," that is, separate items of merchandise.

Membership Warehouse Clubs

Early warehouse clubs primarily targeted small retailers but as time went on, increasing numbers of consumers started shopping in these warehouse clubs as shoppers became aware of the cost savings due to their low overhead.

Membership warehouse clubs are usually large stores, ranging from 80,000 to 140,000 square feet. Warehouse clubs are typically austere with bare concrete floors, unfinished ceilings, and warehouse shelving. Much of the merchandise is placed on shelves in pallets by forklifts. Most of these stores have evolved to where half of their sales are groceries. Substantial merchandise is sold in large packs, such as 24-roll packages of toilet tissue or 12-roll packages of paper towels.

Warehouse clubs operate on a very thin gross profit margin, ranging between eight to 12 percent of sales. Therefore operating costs are kept low by austere facilities and by shipping merchandise directly from the manufacturer to the store. Because of limited selection of goods at these membership warehouse clubs, their impact on other commercial sector merchants is less when compared to discount general merchandise stores.

"Category Killer" Stores

Large retail stores that specialize in a fairly narrow line of merchandise are called "category killer" stores. These stores have a large selection within a narrow category of merchandise and often smaller stores cannot compete in categories where they have a limited selection. In most cases, store personnel are very knowledgeable about the merchandise. These stores typically require a high traffic count. This means stores such as Home Depot, Circuit City, The Good Guys, Office Depot, Staples, Oshman's Sporting Goods, Sportsmart, etc. normally locate in mid- to large-sized cities. However, these chains are now experimenting with smaller format stores in smaller communities.

Factory Outlet Malls

Factory outlet malls originated on the East Coast but have now migrated across the nation. The first factory outlet malls were located downtown in vacant factories and warehouses. Now most of the malls are located along interstate highways and within the commuting distance of population centers.

Factory outlet malls vary in size from eight to 10 stores up to 75 to 100 stores. Most stores in factory outlet malls are apparel stores but more specialty stores, such as bookstores or house ware stores, are appearing in these malls.

A good study showing the sales of factory outlet malls could not be found. However where shopping malls have located in states with good sales tax data such as Iowa, shopping malls generate $20 to $60 million per year in retail sales (Stone, 1995).

Mail Order Houses and Internet Shopping

Mail order houses have evolved from general catalog sales merchants like Sears, Montgomery Ward, and J.C. Penney to specialty sales. Currently, there are thousands of specialty mail order houses that sell computers and supplies, office supplies, apparel for the whole family, and sporting goods, just to mention a few.

As of 2008, 85 percent (875 million) of the world's online population has used the Internet to make purchases. Books are the top item purchased online while clothing/ accessories/shoes follow. Consumers tend to stick with what they know and buy from a site that they have previously used. Online search engines also play a big role in where consumers make their purchases.

Word-of-Mouth (WOM) or Social Networking Marketing

Word-of-mouth (WOM) marketing uses social networking technology as means of marketing. People are currently able to advertise a business, send out promotions, and attract new customers using networking programs such as Facebook, Twitter, phone applications, and more. These programs are designed to meet the marketing needs of a business and give people an online community of friends that allow them to share their background, current activities and photos. Word-of-mouth communication strategies are appealing because they combine overcoming consumer resistance with lower costs and fast delivery. With new networking technology, restaurants can advertise at home or inform customer of their daily specials and location.

National Retail Trends

From the U.S. Bureau of Labor Quarterly Census of Employment and Wages (2010), the U.S. Census of Retail (2007), and the Consumer Science and Retailing Department at Purdue University (1998), the following is a list of national retailing trends.

- The national retail sector consisted of approximately 11.3 percent of total national employment in 2009.
- In 2009, the national retail sector employed more people than the national manufacturing sector.
- Nationally, the retail sector in 2007 had sales of $3.9 trillion and employed 15.5 million people in 1.1 million establishments.
- The national retail sector in 2007 generated sales of $3,502,286 per establishment, generated sales of $251,880 per employee, with average compensation of $23,000 per employee.
- Nationally, 15 percent of all retail stores generated less than $250,000 in sales in 2007.
- Nationally, 45 percent of total retail stores generated sales of less than $1,000,000 in 2007.
- Over 58 percent of total retail gross leasable space is located in shopping centers including shopping malls.
- Retail employment is expected to grow by 4.3 percent between 2008 and 2018, representing 654 thousand new jobs.
- In the 1960s, the U.S. had 4 square feet of retail space per capita.
- In 2007, the U.S. had 20.9 square feet of retail space per capita.

State of Nevada Retail Trends

From the U.S. Bureau of Labor Quarterly Census of Employment and Wages (2010) and U.S. Census of Retail Trade (2007), the following trends in state of Nevada retail trade are enumerated.

- The retail trade sector consisted of approximately 11.3 percent of total Nevada employment in 2008.
- Retail trends in the state of Nevada accounted for $37.4 billion in sales and employed 139,829 people in 8,492 establishments in 2007.
- Retail trade in the state of Nevada generated $4,408,146 in sales per establishment, generated sales of $267,712 per employee, and paid an average wage of $26,400 per employee in 2007.

Lander County Retail Trends

From the U.S. Bureau of Labor Quarterly Census of Employment and Wages (2010) and U.S. Census of Retail Trade (2007), the following trends in Lander County, Nevada retail trade are enumerated.

- The retail trade sector employed 8.3 percent of total Lander County employees in 2009.
- Retail trade in Lander County accounted for $54.9 million in sales and employed 237 people in 22 establishments in 2007.
- Retail trade in Lander County generated sales of $2,499,136 per establishment, generated sales of $231,987 per employee, and paid an average wage of $16,755 per employee in 2007.

Small Town Downtown Market Trends

Small city downtowns throughout the country are being rediscovered as historic, authentic and sustainable mixed-use centers that offer places for shopping, employment, housing, dining, culture, and worship. Unlike shopping centers that primarily serve national retail tenants, downtowns enjoy diversification of use. Downtown environments are growing in popularity among many segments, young and old, who seek an urban (even in rural areas), amenity-rich experience. Downtowns are also gaining interest as a place for sustainable development, offering a central place in the community with opportunities for reusing and improving existing structures. Finally, downtowns have become the location of choice for many entrepreneurs and creative people. The downtown environment offers social and

business interaction, diversity, and amenities appealing to people with various talents.

Economic development planning for any commercial district requires relevant market information to guide business retention, expansion, recruitment, marketing, and other efforts. This information is the focus of a "market analysis". Given the dynamic downtown environment, the traditional retail-driven analytical models no longer apply to downtown districts. Even more sophisticated demand/supply techniques used by national retailers are not applicable. Instead, downtown development professionals must analyze a complex market with a variety of building uses, independent ownership of building and businesses, distinct consumer segments, and intense competition from surrounding commercial centers.

For downtown retail development, four trends were enumerated in a referenced study by Stumpf (2010). These four trends are converging to impact the national, regional, and local retail sector. These four trends are demographic trends, urban growth and sustainability, retail consolidation, and Internet sales.

Demographic Trends

Every generation has a unique expenditure pattern. Consumers start out as children spending very little and increase purchases as their income grows. Then around retirement age, consumers begin to spend less. The Baby Boom, the largest generation, is now beginning to retire. Generation X is much smaller and Generation Y is just beginning to spend. To further complicate the picture, these younger generations have much different interests and desires than the Boomers. This is equally true in work, housing, and shopping.

Growing ethnic populations are a second demographic trend shaping future retailing. It has been said that it won't be long before minorities become the majority. They are already a major force in retailing. Efforts among chain retailers to reach out to these diverse populations, as well as the arrival of new or foreign chains to accompany the independent merchants serving these markets, have begun.

Urban Growth and Sustainability

Smart Growth has always been embraced by advocates of downtowns, as many see its principles as benefitting urban centers and redirecting development inward. The real test is whether the general public embraces it, and evidence is

starting to accumulate to say that it has. A growing segment of the population, from retiring empty-nesters to young singles, is showing a preference for urban living. The population has stabilized, and in many communities, the urban core is growing. Walkable downtowns and neighborhood shopping districts have been reinvigorated by this trend, which most analysts believe will continue to grow once the housing market sorts itself out and begins to grown again.

Retail Consolidation

There are fewer retailers around now. Decades of consolidation have left the U.S. with a handful of department stores, three major office supply chains, three major hardware dealers, two and one-half discount store chains, one electronics giant, and one bed and bath outlet. Consumers are bored. Boredom demands a counter-trend. It can happen downtown.

Internet Sales

Lastly, there is the Internet. A growing proportion of sales are occurring online. Certainly online sales will continue to grow, but what may be the long-term prognosis for retail in general, and downtown in particular? Will online sales lead to a scaling back of the major chains and expanded reach for smaller retailers? The Internet could be an opportunity for downtown businesses to supplement their sales and compete effectively against larger local competitors. Also, the use of mobile phone apps and coupons may provide a new avenue for rural retailers to capture local customers. The jury is still out on this one with the end results yet to come.

Synopsis of Research Concerning Factors Influencing Rural Retail Sector Trade Activity

Below is a list of short synopses of research findings concerning factors influencing rural retail sector trade activity. The objective is to provide concise findings of academic and professional articles that may provide assistance to Lander County decision-makers in formulating strategies and targets for local commercial sector development activities.

- Stone (1988) found that if a shopping mall is present in a county, total retail sales for that county increased by $75 per additional square foot of retail space. However, when a shopping mall is located outside the county and is within 25 miles of the county seat, total county retail sales decreased by $4.86 for each additional square foot of mall space. When a mall is located outside the county and within 26 to 50 miles of the county

seat, county retail sales realized a loss of $0.61 for each additional square foot of mall space.

- Yanagida et al. (1991) developed an analytical framework for explaining pull factors across counties in the state of Nebraska. They found that lower retail sales leakages may be attributed to counties that are situated farther from trade centers, have large federally adjusted gross incomes, and experience lower county population decreases than average rural Nebraska. Specifically for Nebraska counties, the smaller the population of the largest town, the more significant the sales leakage.
- Ayers et al. (1992) completed a study of rural retail businesses in 37 communities in the three states of Indiana, Iowa, and North Dakota. Their analysis identified both supply and demand factors in capturing local demands. Factors capturing additional local demands were (1) a more diverse local economy, (2) providing business management training and technical assistance, (3) establishing a mechanism to increase transfer of business operations to new owners, (4) developing financial assistance programs for new and aspiring businesses, and (5) developing extension and outreach programs that assisted communities to understand and cope with a changing economy.
- Gruidl and Andrianacos (1994) found that demand factors played a central role in rural retail sector capture. County population and income levels were found to have significant impacts on rural retail sector expansion. However, elements underlying the supply side of the rural retail market such as access and adoption of new retail sector technologies were important components to rural retail sector trade. Gruidl and Andrianacos (1994) concluded their paper by calling for better understanding of the forces influencing rural retail sector markets. If <u>demand</u> is found to be a major factor underlying rural retail sector markets, then public policy efforts should focus on expanding basic or export sector employment and income. However, if declines result from supply side factors, such as efficiency of local retail trade sector, customer relations, etc., then efforts to improve competitiveness of rural retail sector owners must be a primary objective.
- Darling and Tubene (1996) investigated retail sector activity for 87 rural Kansas cities. Their results showed that city population alone explained significant variation in taxable retail sector sales. Kansas cities with population over 5,000 consistently showed an inflow of retail sector trade.
- Gale (1996) used time series data to investigate trends in rural retail sector activity. Gale found that from 1982 to 1992, rural counties were losing their capture of local retail sector trade. Factors influencing retention of retail sector trade capture were high population density, lower farm reliance, larger county size, and access to interstate highways.
- Bhuyan (1997) found through disaggregated analysis of retail sector trade in North Dakota that niche markets for specific goods and services exist within rural counties where the firms may effectively compete.
- Harris and Shonkwiler (1997), Shonkwiler and Harris (1996), and Ebai and Harris (1997) found that retail sector firms are interrelated and that number and type of retail sector firms greatly impact the probability of existence of other types of retail sector activities.

- Brooks and Whitacre (2011) found that the existence of a Critical Access Hospital in a rural area positively impacted local retail activity. The retail activity from a critical access hospital in a rural community is similar to an existence of a Walmart.

Synopsis of Impacts of Large Retail Stores on Rural Retail Trade

This is a list of short synopses of research findings concerning factors influencing rural sector activity by large big-box retail firms. The objective of this sub-section is to provide concise findings of academic and professional articles for Lander County decision-makers pertaining to "big-box" retail firms and their potential impacts to the Lander County retail sector.

- Keon, Robb, and Franz (1989) compared economic conditions in fourteen (14) Missouri counties with and without Walmart stores. They found no evidence of net negative impact of Walmart location, instead finding increases in broad measures of income, retail employment and income, and sales tax revenues. At the retail level, they found that overall number of retail stores declined, but there was more employment and slightly higher payrolls.
- Ozment and Martin (1990) investigated what happened if Walmart entered communities that had positive growth rates. After incorporating the effects of overall county or community growth rates, they found that Walmart had few significant positive effects on the sample rural counties. The authors conclude that Walmart may have selected faster-growing counties for store locations, and that the growth in the economy was not likely associated with Walmart entrance.
- Stone (1997) examined four Iowa communities of 5,000 to 40,000 in population to find the impact of Walmart on local retail sales capture. Stone found in the short-run, Walmart induced increases in several retail sectors. Stone suggested that in the long-run, retail sales capture between counties with Walmart versus those without will continue to modestly diverge. In the short-run, the divergence is more pronounced. The reason for this divergence is that consumers will travel to counties with a Walmart and do substantial retail sector purchasing in the county with a Walmart.
- Barnes and Connell (1996) found for northeastern counties in the U.S. that the location of Walmart had impacts on patterns of retail sector establishment numbers and sales. They found that the location of a Walmart increased general merchandising sector sales, but not establishment numbers, had little or no change on sales or establishment number for the grocery store sector, but decreased sales in the automobile sector and furniture sector while increasing sales in the eating and drinking sector, the apparel sector, and the drug store sector.
- Hicks and Wilburn (2001) investigated the impacts of the entrance of a Walmart store in the host county and adjacent counties in West Virginia. They found the impact of a Walmart store was much more pronounced than the overall county growth rate. Their results indicated a net benefit

to employment and wages of having a Walmart locate in a county. Interestingly, the increased new employment from the location of the Walmart occurred mostly in the first year, which tended to be permanent for at least three years. For adjacent counties, employment decreased.

- Franklin (2001) found that the decision of Walmart to enter West Virginia markets was based on population size, not population growth or per capita income.
- Stone and Artz (2001) found that for Midwestern counties, retail capture in the host counties of big-box building materials stores (Home Depot, Lowes, Menards, etc.) gained significantly after a big-box store located in a county. Before the big-box store, the average host county had building materials sales leakages; however, after six years of the big-box store being located in a county, the average host county had building materials sales surplus of $20 million. Non-host counties had building materials sales leakage that worsened over time. Economists would call this a zero-sum result. Some counties capture sales while others lose.
- Artz and Stone (2006) showed that Walmart super stores had a negative effect on rural grocery store sales during the first two years in Mississippi. After two years, the Walmart effect dissipates. Walmart super stores also impacted the prices of local competing retail businesses.
- Goetz and Rupasingha (2006) found that Walmart's presence depressed social capital in a community. That is, where Walmart is located, the number of churches, political organizations, and business groups are lower per capita.

SECTION II

NEEDS AND PERSPECTIVES OF BATTLE MOUNTAIN BUSINESS OPERATORS

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NEEDS AND PERSPECTIVES OF BATTLE MOUNTAIN BUSINESS OPERATORS

Battle Mountain, an unincorporated municipality, is the county seat and largest metro area in Lander County, NV. Historically, the Battle Mountain economy has been prone to "boom and bust" cycles influenced largely by regional mining activity. The Battle Mountain Business Operator survey sought to understand business owners' perspective about the current business and entrepreneurial climate in Battle Mountain and how that climate could be improved for existing and new business owners.

Survey Overview

The survey was designed in part using previous business owner surveys generated by a variety of other university Cooperative Extension programs. The questionnaire was reviewed and modified to best address entrepreneurial concerns specific to the Battle Mountain community. While few questions overlap, the business owner survey is intended to be analyzed in conjunction with a separate survey covering opinions of Battle Mountain consumers.

Types of Questions

- Business Demographics: Operations, Location, and Marketing.
- Other Businesses: Competition and Complements.
- Community Perspectives.
- Business Challenges and Desired Assistance.

Survey Distribution and Response

Because the population of Battle Mountain is relatively small (2,871 as of the 2000 census), all Battle Mountain businesses were targeted for this survey. The Dillman Method (Dillman et al., 2009) was employed across all steps of survey design and implementation. An announcement was posted in the *Battle Mountain Bugle* for each round of business owner survey implementation in lieu of individual pre-announcement letters.

One hundred and seventy-two businesses were surveyed. The addresses were obtained from the Lander County Office of Community Development and

represent all existing businesses within Battle Mountain. One hundred and twenty of the 172 businesses were randomly selected for the initial survey implementation. The randomly selected 120 surveys were delivered in person by the Battle Mountain High School Leadership Class (BMHSLC) on April 19, 2010 and April 28, 2010. Surveys were then sent by mail on May 25, 2010 to the remaining 52 businesses not surveyed by BMHSLC as well as to the 67 non-responding businesses surveyed by BMHSLC.

Fifty-two of the 120 surveys implemented by BMHSLC were returned reflecting a 43.3 percent response rate. Nine of the 119 mailed surveys were returned – a 7.6 percent response rate. With 63 total respondents of the 172 surveyed, the overall response rate was 36.6 percent.

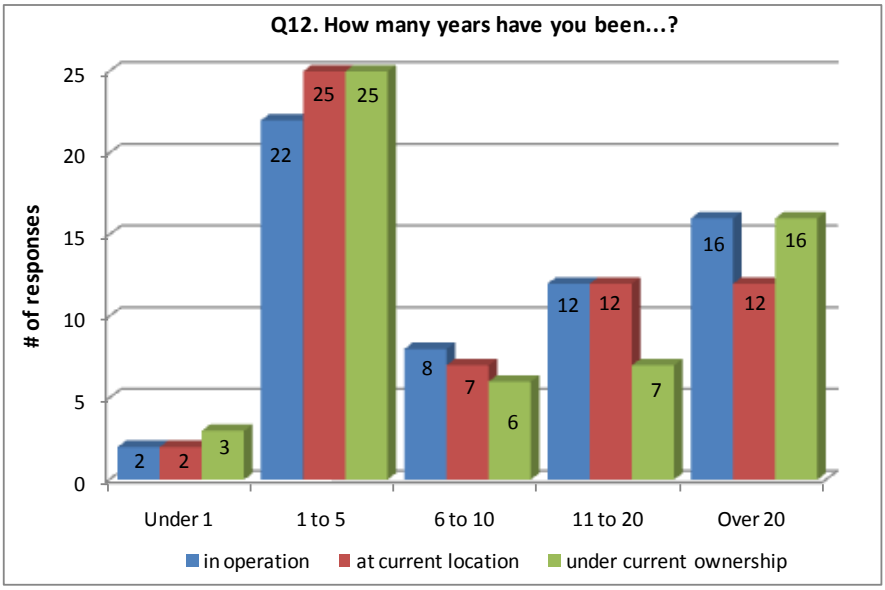
Survey Response

Business Demographics: Operations, Location, and Marketing

- *Operations*

How many years has your business… (Q12)

Participants were asked to choose a single time length (in years) for each of three business descriptors: operations, location, and ownership. For each of these business descriptors, the largest number of businesses had been in business from one to five years and over 20 years. Not many businesses in Battle Mountain reported being in business for six to 20 years either operating at their current location or under their current ownership.

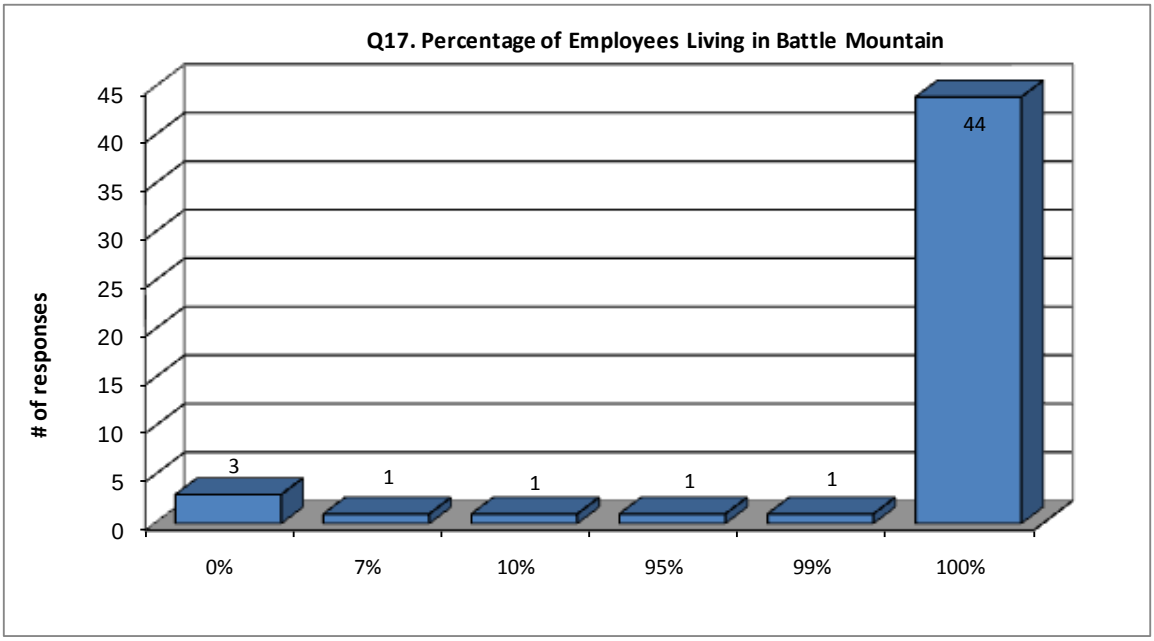


Staff and ownership hours and residence. (Q17)

This was an open-ended question with four distinct sections. Participants were asked to write in percentage of employees living in Battle Mountain, then to provide the number of fulltime, part-time, and seasonal employees and owners. Fulltime was defined as 32 or more hours per week.

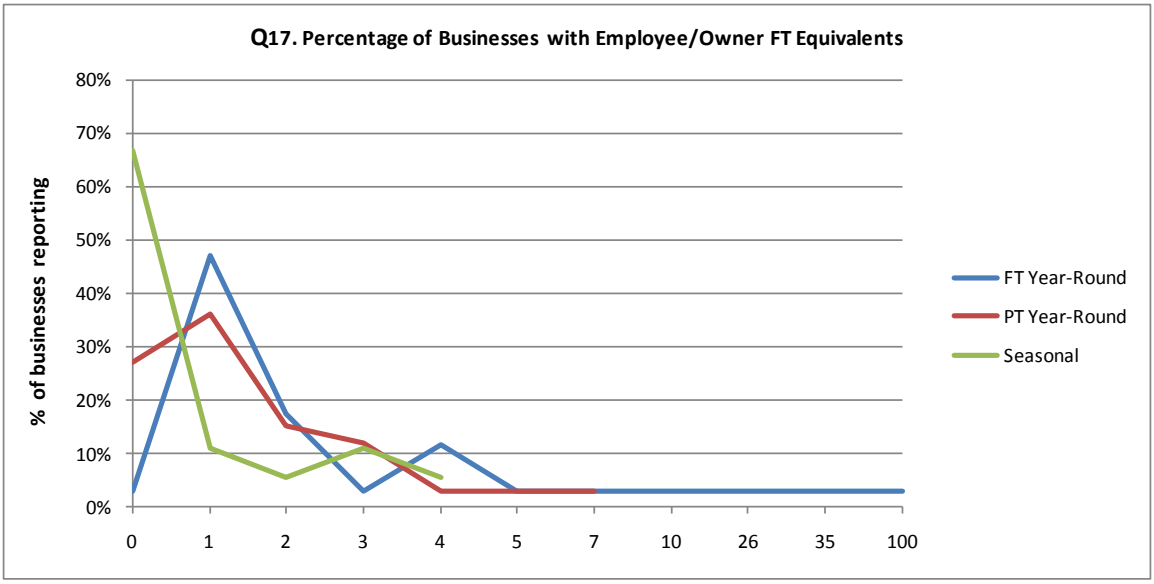
What percentage of your employees live in Battle Mountain?

Of the 51 businesses that responded, an overwhelming number of businesses (90.3 percent) reported that 95 percent or more of their employees lived in Battle Mountain.



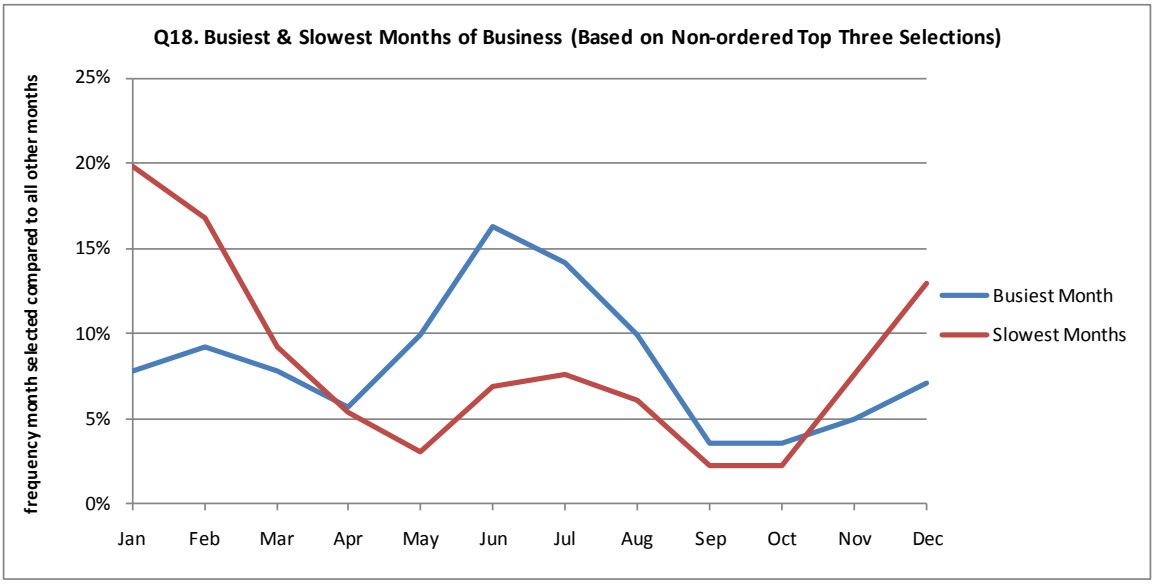
How many people including owners are full-time workers?

The majority of businesses that responded reported that they had three employees, with most being seasonal employees.



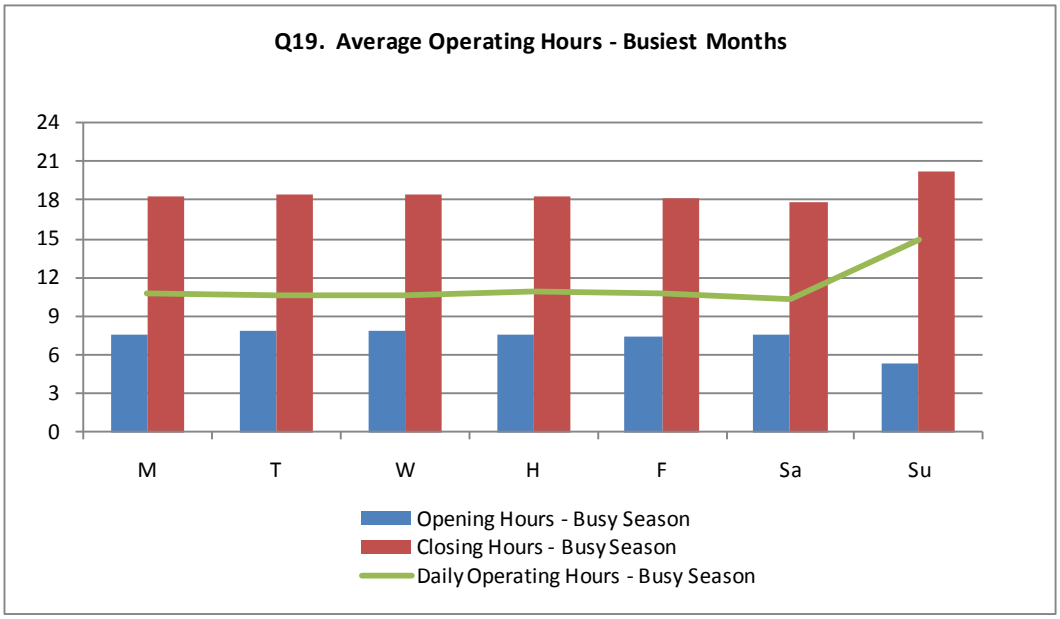
<u>What are the THREE busiest and THREE slowest months of the year for this business? (Q18)</u>

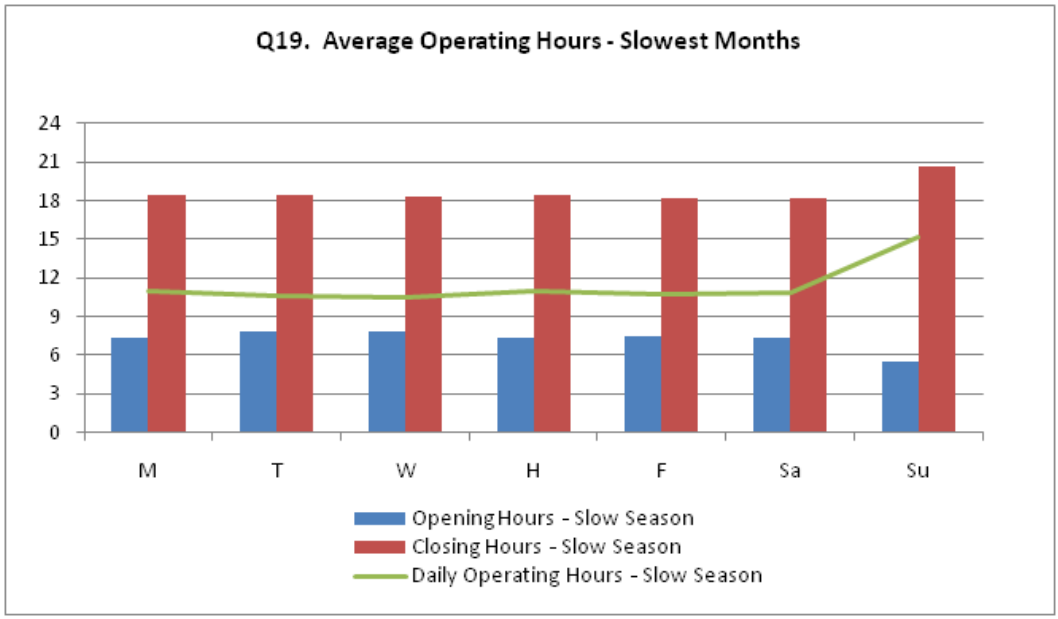
Participants were asked to choose three of the 12 months that are the busiest and three of the 12 months that are the slowest for their business. The busiest months were reported to be June, July, and August; while the slowest months were reported to be January, February, and December.



What are the hours of operation of your business? (Q19)

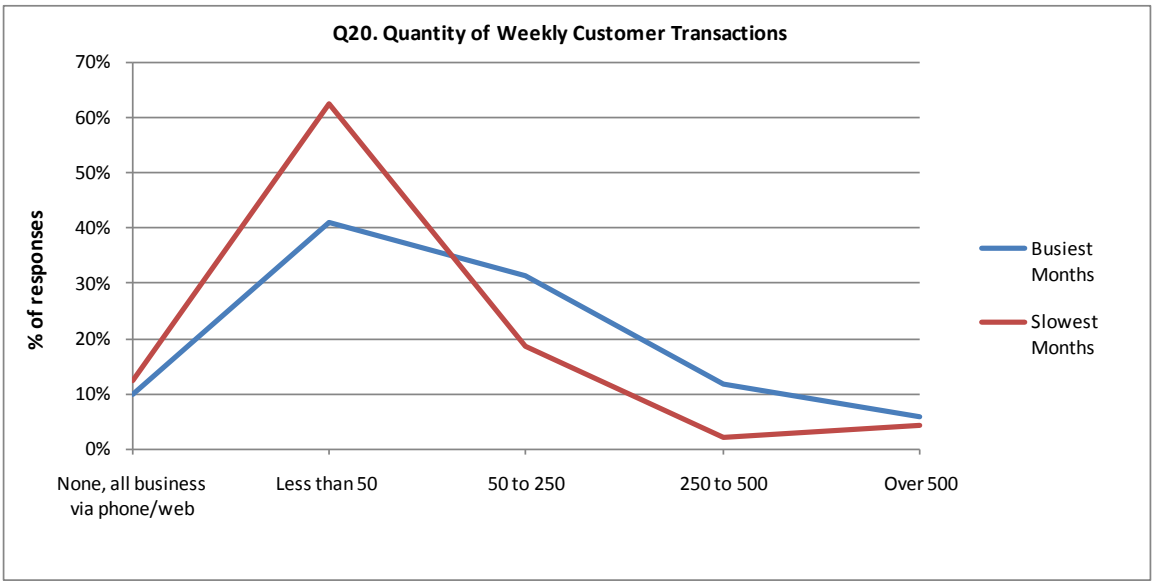
This was an open-ended question. Participants were asked to write in opening and closing times by day of the week for both their busiest months and slowest months of the year. The charts below reflect the average times provided for each particular month, weekday, and open/close. Times are presented in military time. There were only very slight differences reported in operation times for the busiest and slowest months. The green line, representing the "Daily Operating Hours", reflects the average number of total hours a business is open for operation.





How many customer transactions do you do per week during the busiest months and the slowest month? (Q20)

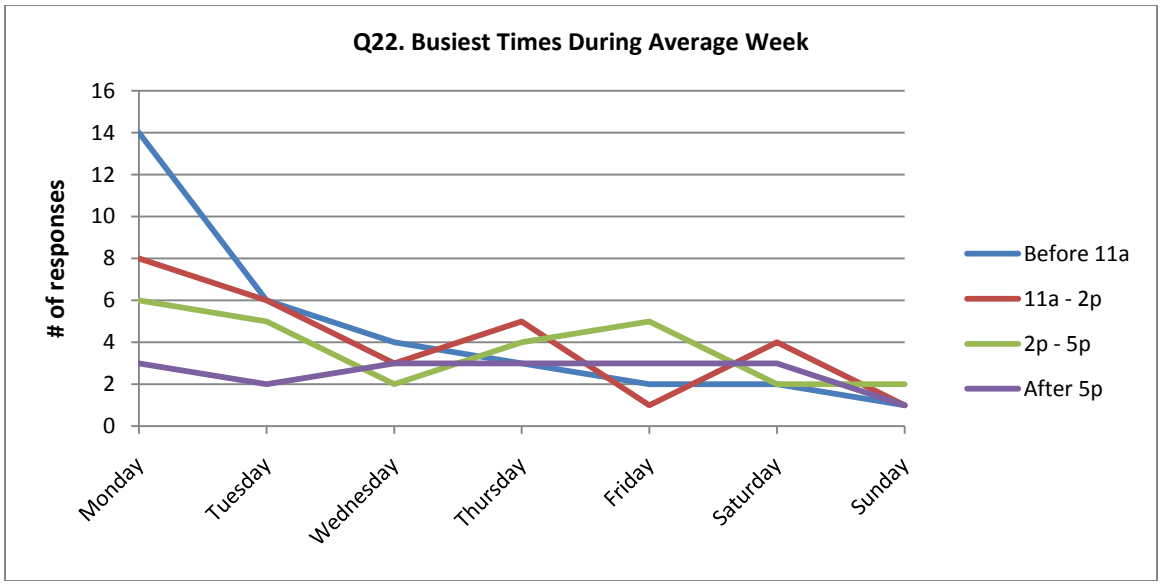
Participants were asked to choose one of five monthly transaction ranges for both the busiest and again for the slowest months. Transaction ranges spanned from "None, all business via phone or web" to "Over 500". During the "Slowest Months" a majority (62.5 percent) of respondents reported a lower number of transactions ("Less than 50"), while the "Busiest Months" reflected transactions that were more evenly distributed across the ranges.



During an average week of the year, what are the busiest times for your business? (Q22)

Participants were asked to choose four out of 28 time blocks that were the busiest for their business. Time blocks were defined by day of the week then further by four distinct blocks of hours (e.g. "11:00 am – 2:00 pm). Responses were excluded for respondents selecting more than four time blocks. One hundred and four time blocks were recorded.

Monday was reported as the busiest time for all time blocks with "Before 11:00 am" being the most busy of any of the other 28 time blocks.



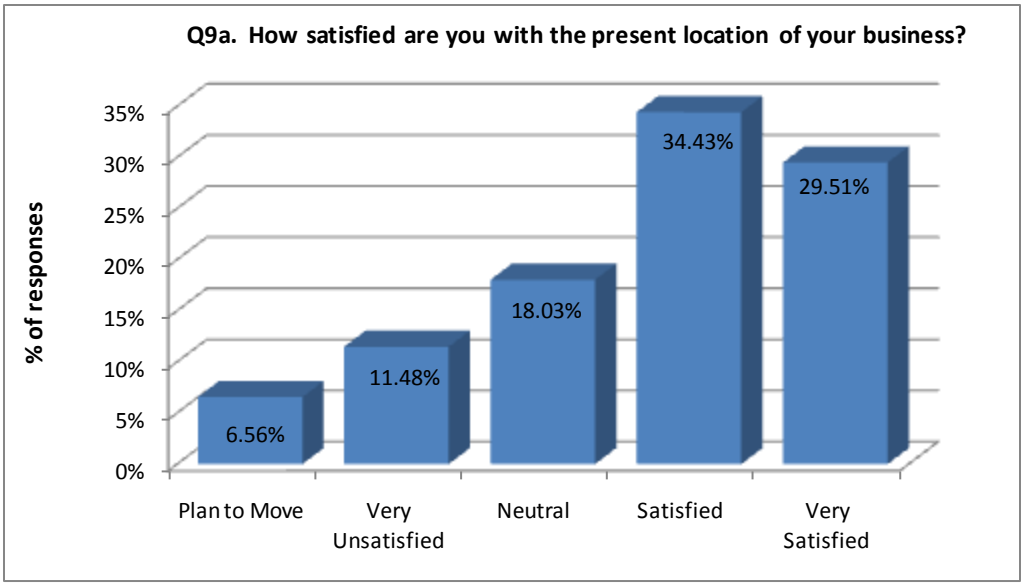
▪ *Location*

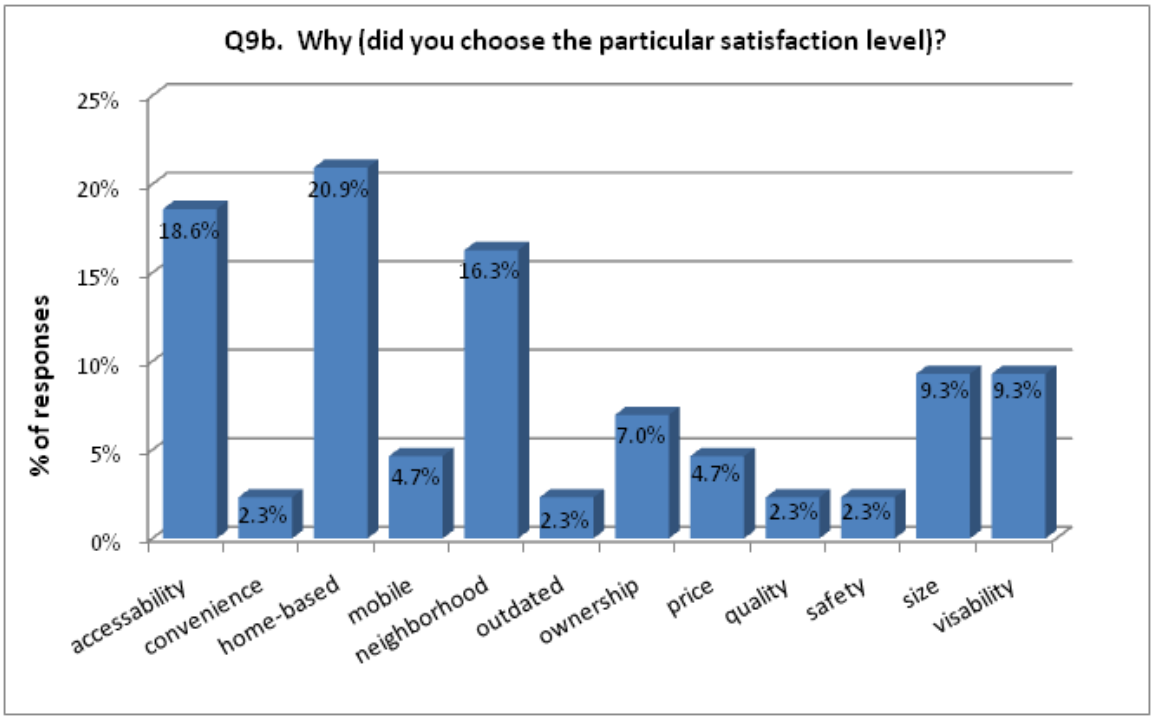
<u>How satisfied are you with the present location of your business? (Q9)</u>

This was a two-part question. Participants were first asked to choose one phrase (e.g. "Satisfied", "Plan to Move") describing their satisfaction level with their present business location. Next they were asked "Why?" and provided several blank lines to provide an open-ended response.

In order to report the findings simplistically, responses were categorized into seven categories such as convenience, price, etc. These descriptors are intended to capture the nature of each statement. An individual statement may have been categorized in more than one category. For example, a statement such as "Lots of space, hard to find." would have been classified in both "size" and "visibility".

Approximately 64 percent (63.94 percent) of the respondents stated that they were "Satisfied" or "Very Satisfied" about their current location. No one responded that they were "Unsatisfied" with their location. Of all respondents, regardless of positive or negative satisfaction, 72.09 percent provided location related explanations for their response.

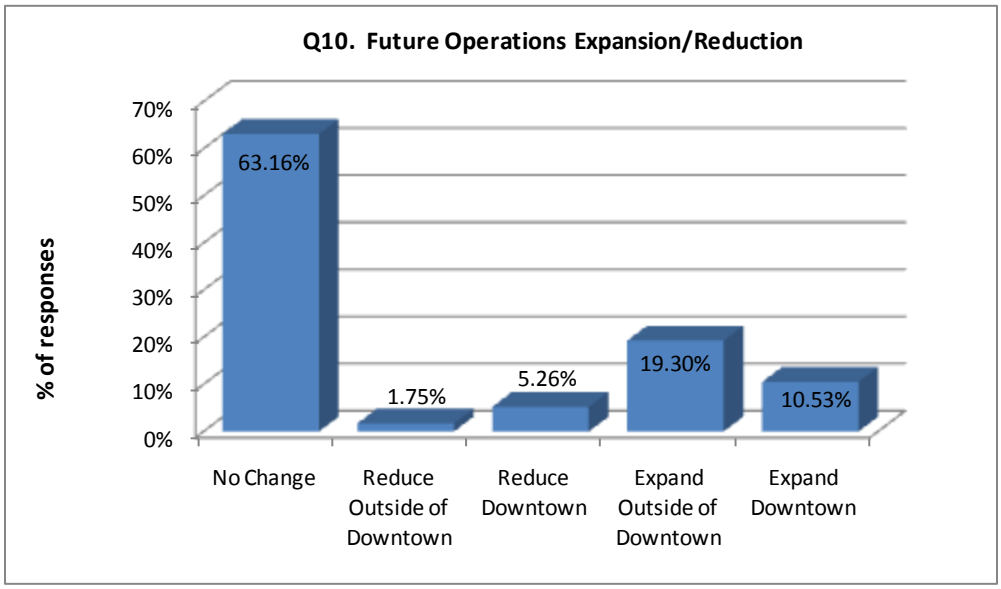




<u>Do you have plans to expand or reduce operations of your business in the next year? (Q10)</u>

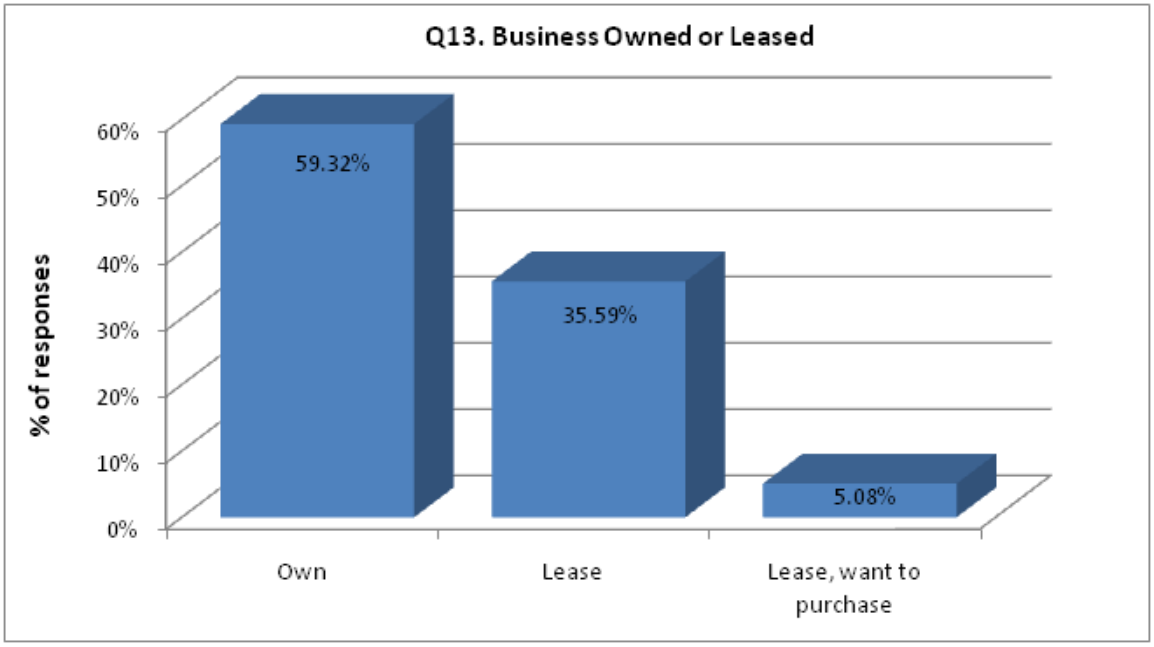
Participants were asked to choose a single response to this question. Participants were asked about their plans for their operation's expansion or reduction. The majority of responses (63.16 percent) indicated no planned changes.

Of those that did plan to change, the majority (19.3 percent) planned to expand outside of the downtown area.



<u>Does your business own or lease the space in which it is located? (Q13)</u>

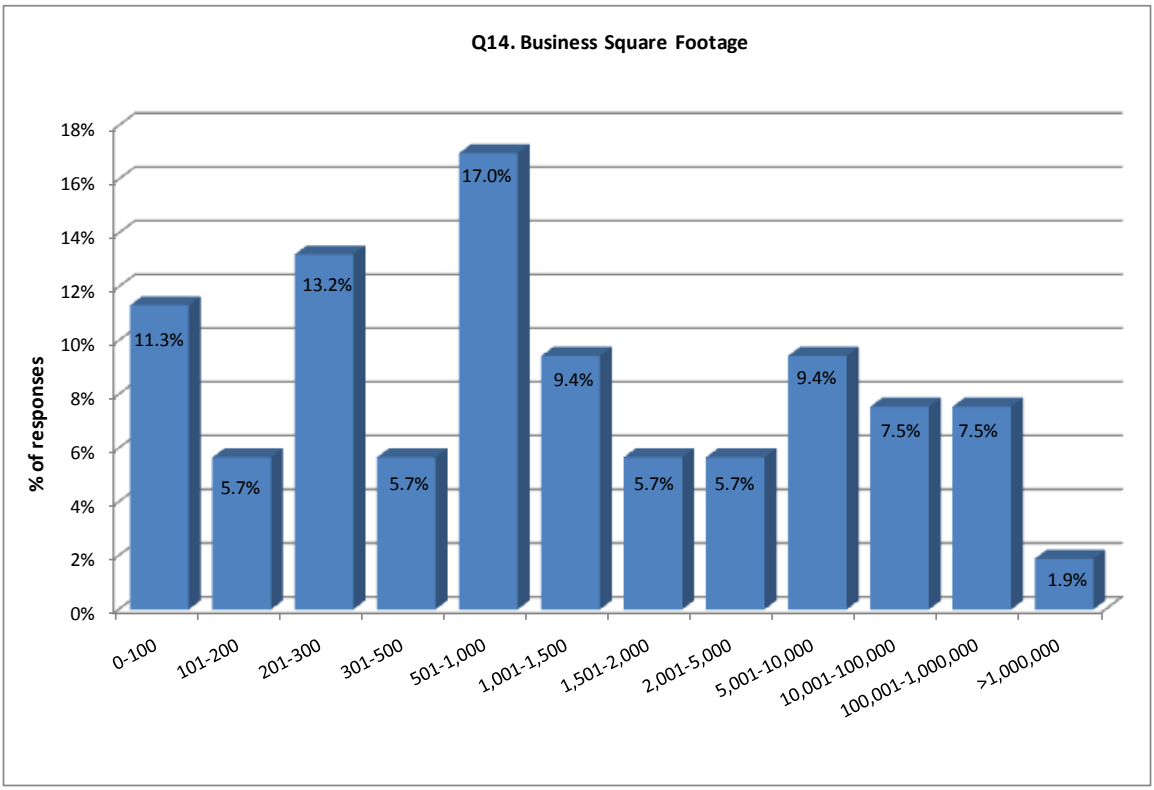
Participants were asked to choose a single description of ownership status – "Own", "Lease", "Lease, want to purchase". The majority (59.32 percent) of business locations were reported as being owned by the operators.



How many square feet are devoted to your business? (Q14)

This was an open-ended question. Participants were asked to write in the square footage for their entire area of operations. Excluding the six largest square footage reports, the average square footage was 3,788 square feet. Outliers on the high end were likely to be mines or ranches. Outliers on the low end were likely to be mobile service providers.

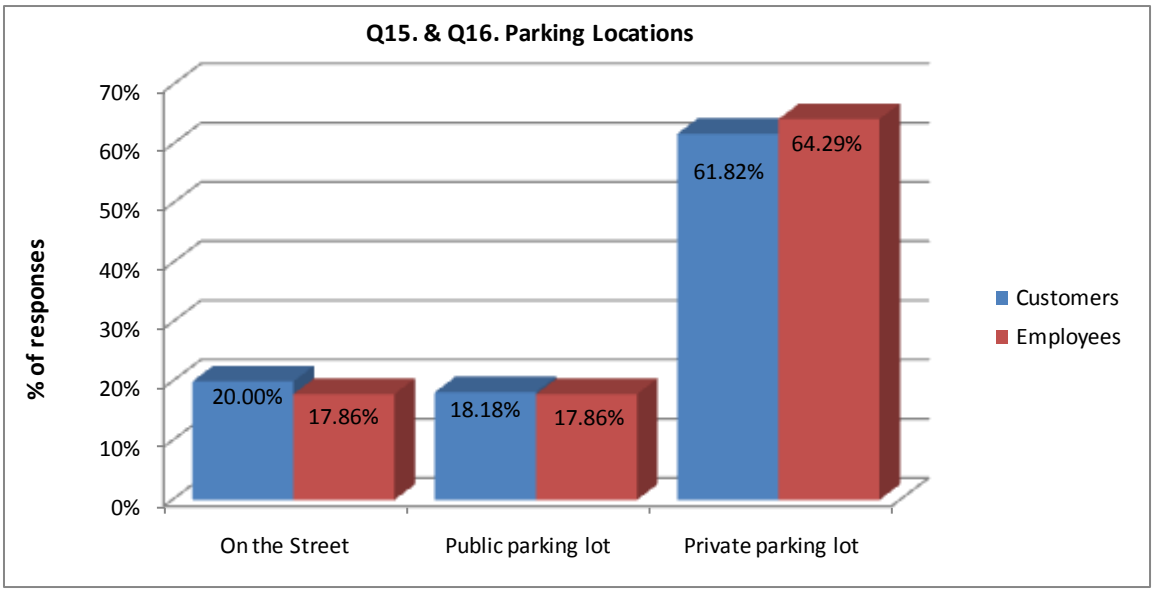
Of those responding, 11.3 percent stated their square footage of operation was between zero and 100 square feet, 13.2 percent replied that their size of operation was between 201 and 300 square feet, and 17.0 percent replied their size of operation was between 501 and 1,000 square feet. These three square foot business size segments made up 41.5 percent of businesses that replied to this question.

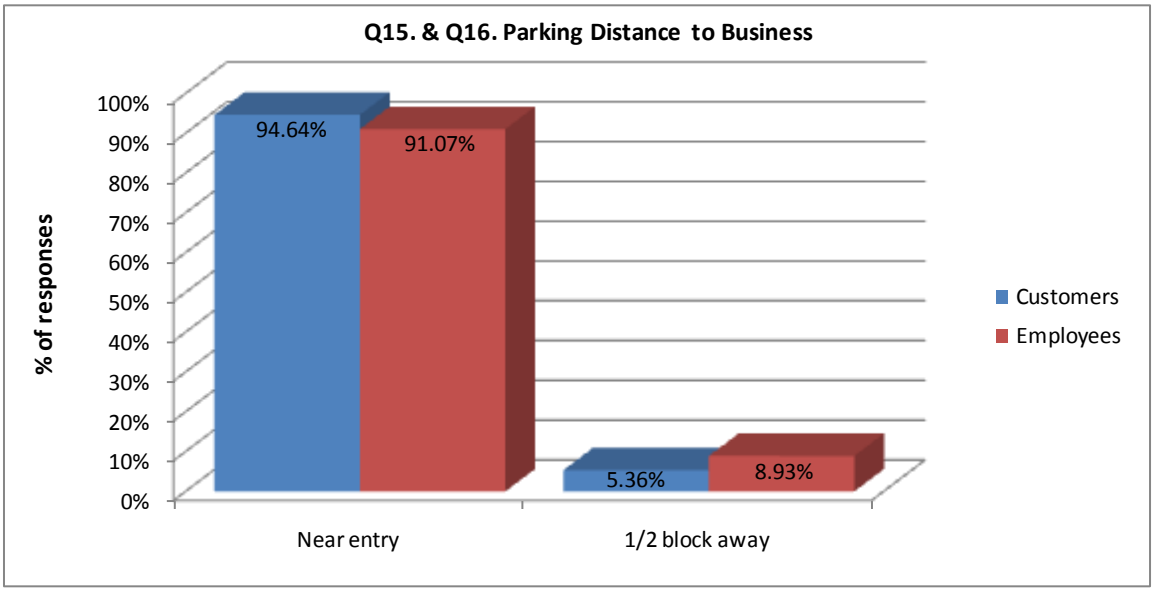


Parking – Customers and Employees (Q15 & Q16)

These questions were nearly identical – both were two-part questions. Question 15 addressed customer parking and question 16 addressed employee parking. Participants were first asked "Where do your [customers or employees] typically park? They were asked to select one answer (e.g. street, parking lot).

Next they were asked "How far do [customers or employees] typically have to park from your business?" They were asked to select one answer (e.g. near entry, 1 block away). A majority reported that customers and employees parked in private parking lots and parked near the entry of the business.



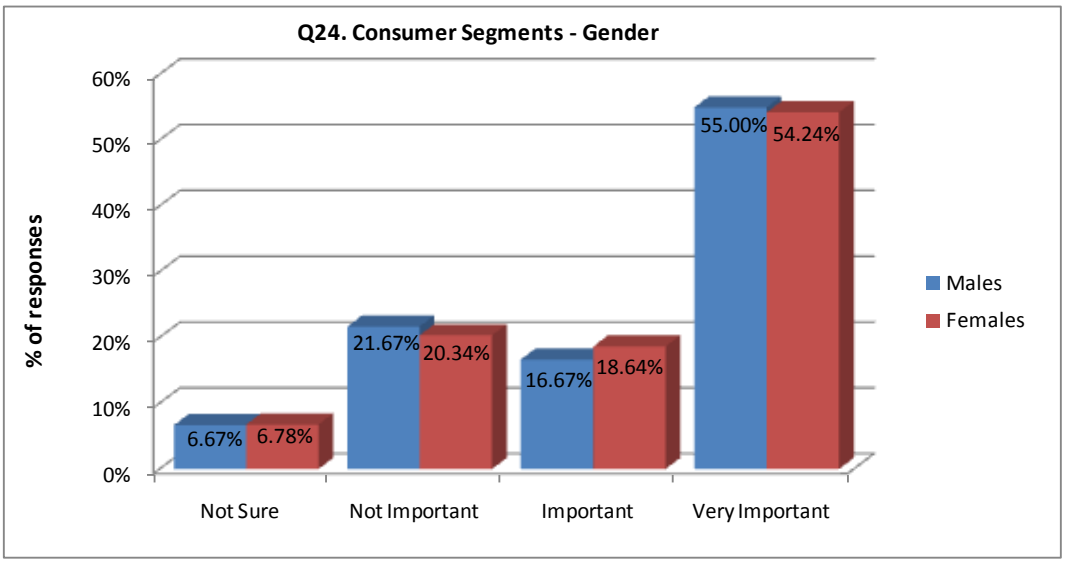


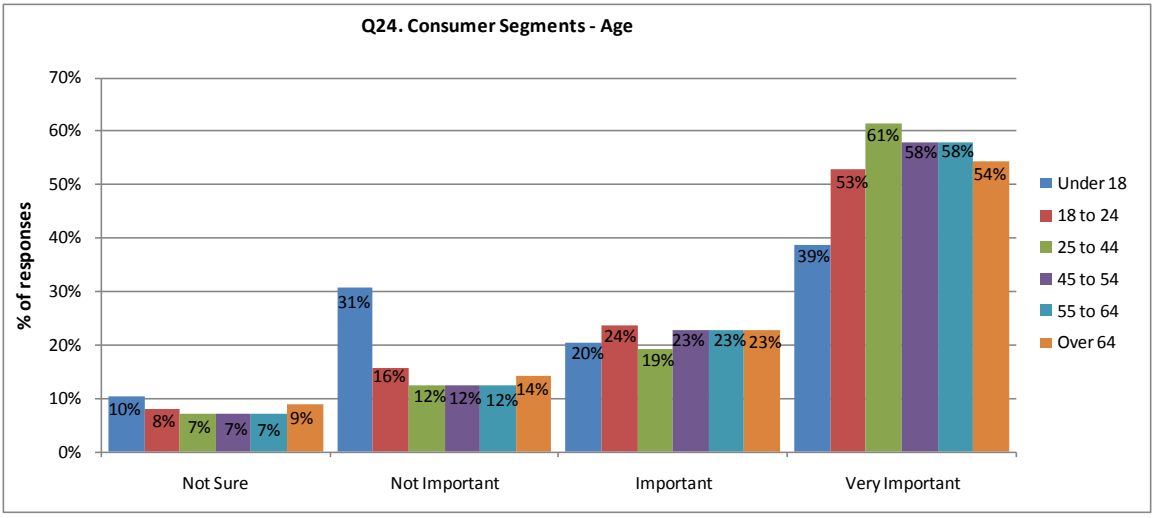
▪ *Marketing*

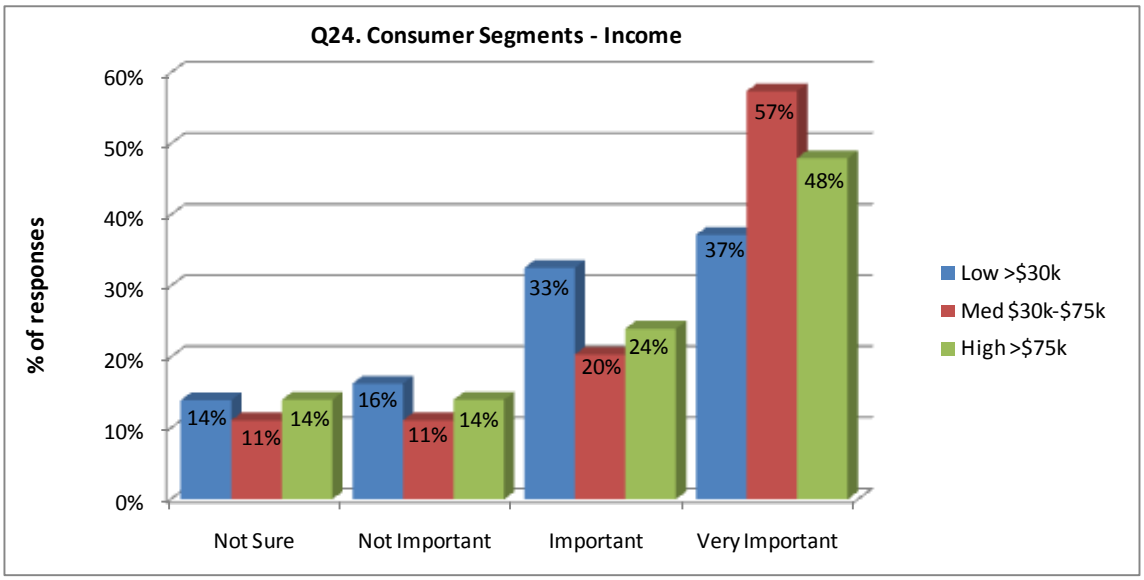
How important are the following consumer segments to your business? (Q24)

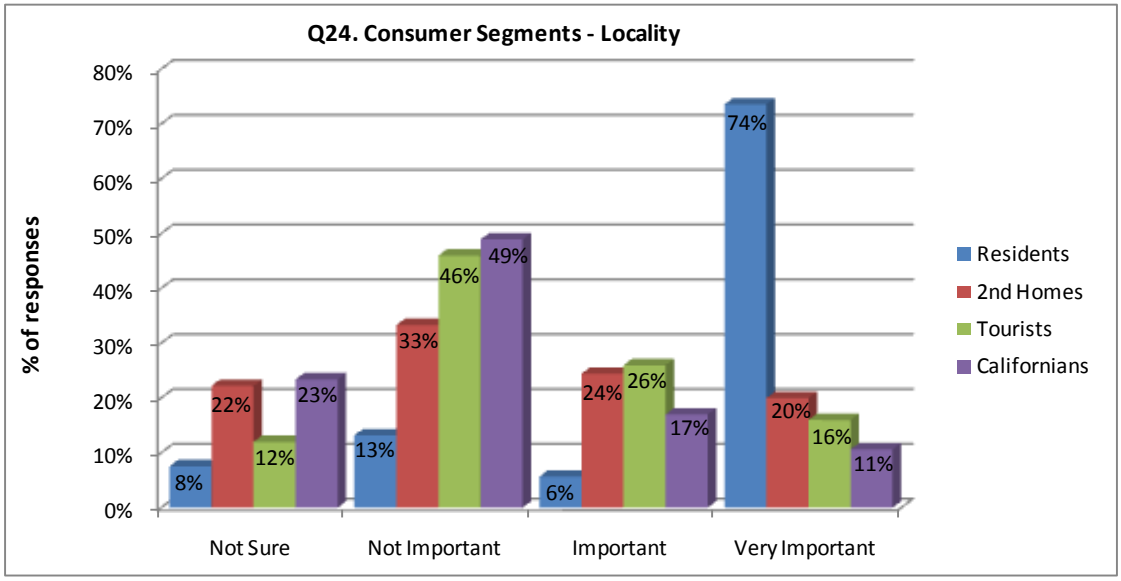
This was a four-part question. Participants were asked to consider the importance of four distinct consumer groups – gender, age, household income, and segment (Battle Mountain residence status). Each group was further broken down into subcategories (e.g. "Male" and "Female" under "Gender"). Participants were asked to choose one level of importance (e.g."Important", "Not Important") for each subcategory. Response numbers ranged from a high of 60 for "Males" (subcategory of "Gender") to a low of 43 for "Low ($0 to $30,000)" (subcategory of "Household Income").

Percentages reflect the selection frequency within each subcategory. The subcategories selected as "Very Important" most frequently were males 25 to 44 with medium household incomes ($30,000 to $75,000) that are residents of Battle Mountain. The subcategories selected as "Not Important" most frequently were males under 18 with low household income (under $30,000) that are residents of California.




Q24. Consumer Segments - Age
% of responses
70%
60%
50%
40%
30%
20%
10%
0%
10%
8%
7%
7%
7%
9%
31%
16%
12%
12%
12%
14%
20%
24%
19%
23%
23%
23%
39%
53%
61%
58%
58%
54%
Not Sure
Not Important
Important
Very Important
Under 18
18 to 24
25 to 44
45 to 54
55 to 64
Over 64


Q24. Consumer Segments - Income
% of responses
60%
50%
40%
30%
20%
10%
0%
14%
11%
14%
16%
11%
14%
33%
20%
24%
37%
57%
48%
Not Sure
Not Important
Important
Very Important
Low >$30k
Med $30k-$75k
High >$75k


Q24. Consumer Segments - Locality
% of responses
80%
70%
60%
50%
40%
30%
20%
10%
0%
8%
22%
12%
23%
13%
33%
46%
49%
6%
24%
26%
17%
74%
20%
16%
11%
Not Sure
Not Important
Important
Very Important
Residents
2nd Homes
Tourists
Californians

Describe your business's E-Commerce (Q30 – Q36)

This set of questions addressed business use of websites and online merchandising. Questions 31 and 34 were open-ended questions – the remainder provided "Yes" and "No" checkboxes.

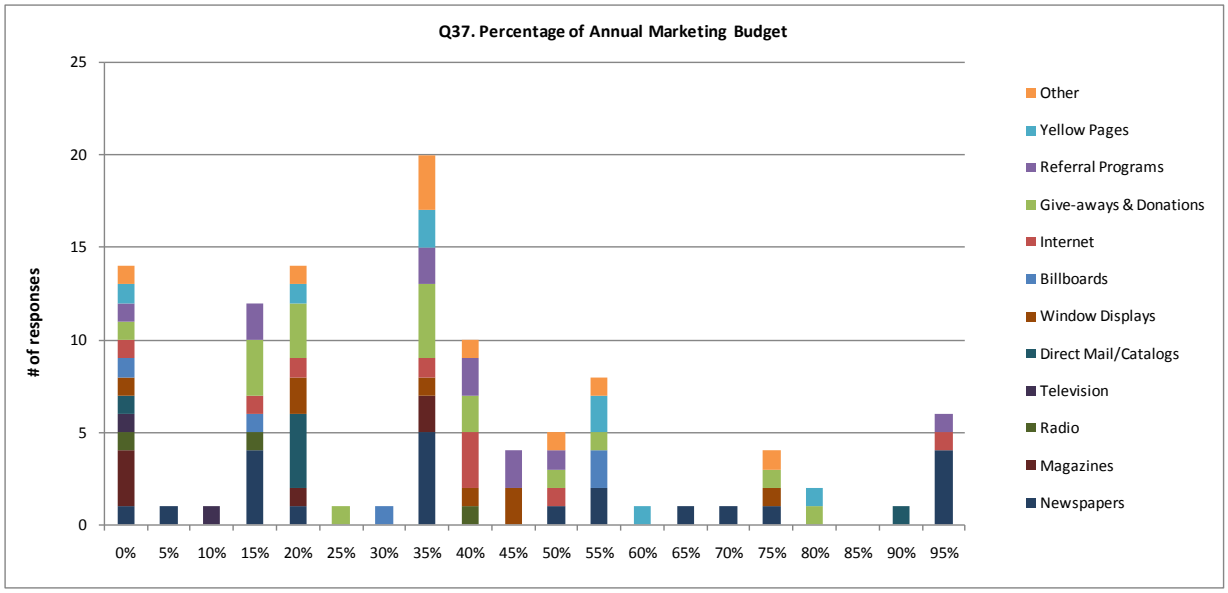
An overwhelming majority of Battle Mountain businesses did not appear to utilize electronic commerce in their operations. With the expanding internet, mobile phone market, and use of social media in retail marketing, this is an area of potential training in Battle Mountain.

	Yes	No	Response
Q30. Do you have a website?	18	41	59
	30.51%	69.49%	93.65%
Q31. If yes, average monthly traffic (as unique visitors)?	-	-	6
	-	-	9.52%
Q32. If no, do you plan on launching one?	16	30	46
	34.78%	65.22%	73.02%
Q33. Do you sell products or services online?	7	54	61
	11.48%	88.52%	96.83%
Q34. If yes, what percent of sales are online?	-	-	7
	-	-	11.11%
Q35. If no, do you plan to sell products/services online?	13	42	55
	23.64%	76.36%	87.30%
Q36. Do you communicate w/ your customers by email?	26	32	58
	44.83%	55.17%	92.06%

What percentage of your annual marketing budget is spent with each of the following media (Total=100)? (Q37)

Participants were asked to fill in their percentage of marketing budget allocated to 12 predefined categories (including an "Other" category) or allocate 100 percent to "I don't advertise". The highest response rate was for "Newspapers" at 34.9 percent. The lowest response rate was 3.17 percent – a tie between "Television" and "I don't advertise".

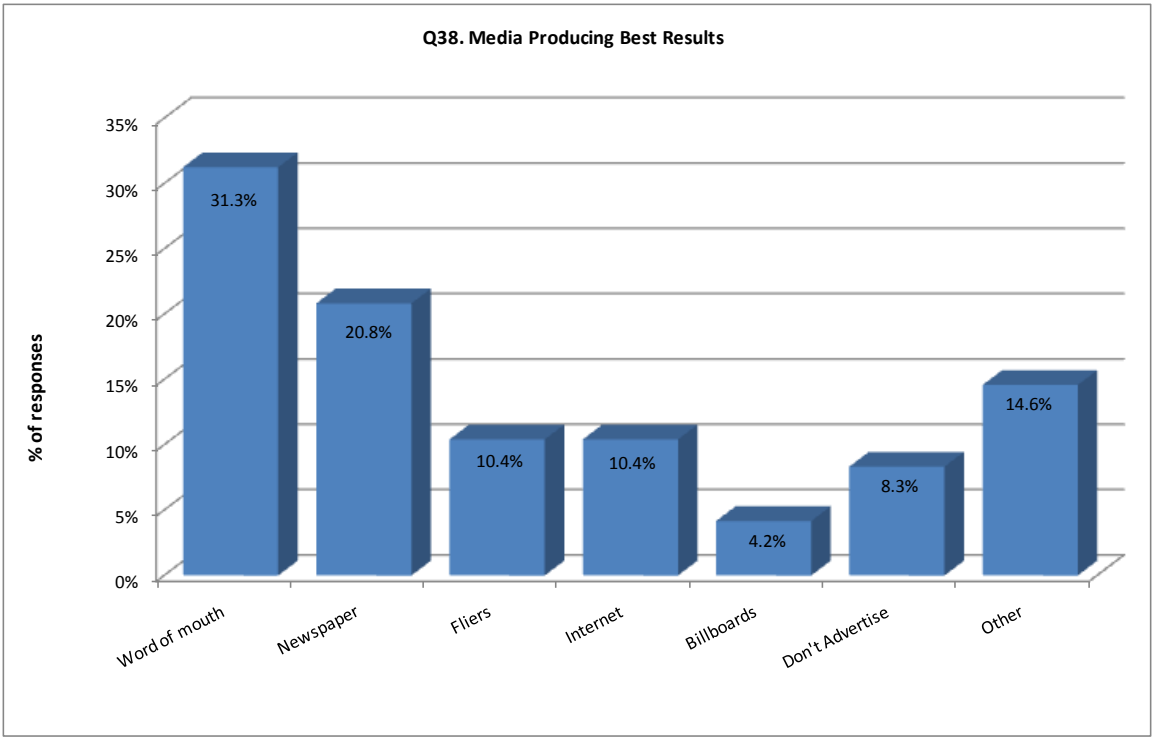
"Newspapers" were reported to be the most utilized media with an average marketing budget percentage of 39.82 percent, followed closely by "Yellow Pages" with an average marketing budget percentage of 35.63 percent. The media receiving the lowest budget share was "Television" at 1.5 percent. "Magazines" were the second lowest at 8.33 percent. The lack of internet, mobile phones, and social media use needs to be addressed by Battle Mountain business operators.



What media has produced the best results for you? (Q38)

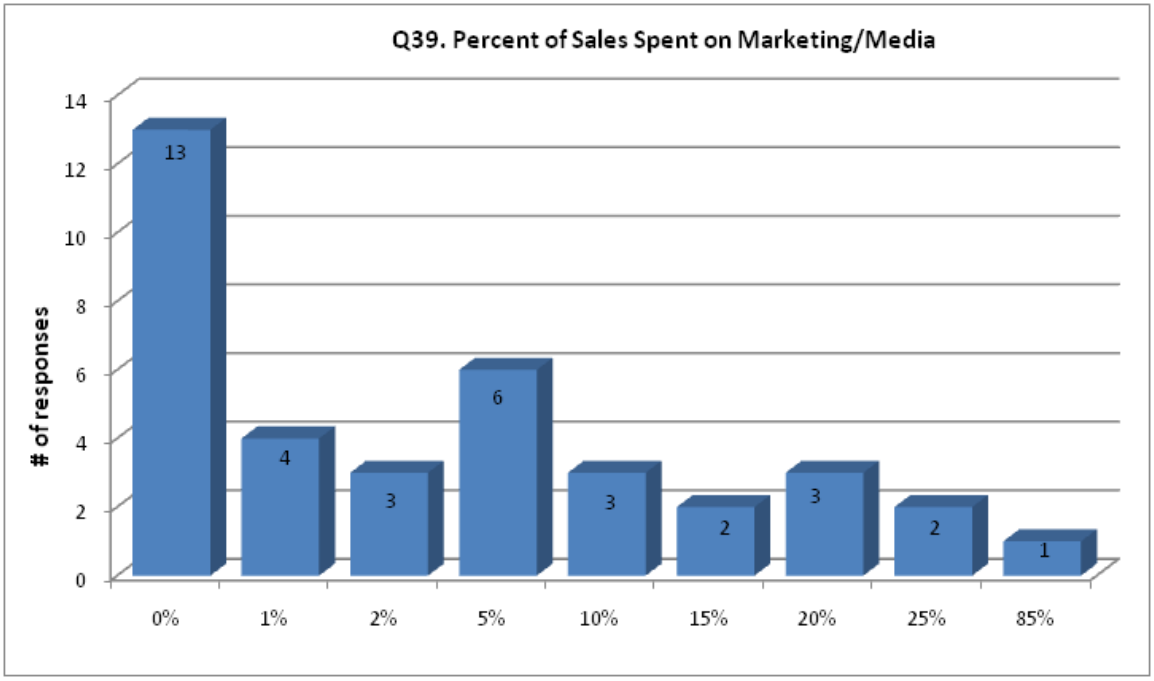
This was an open-ended question. Participants were asked to state what media has been most successful for their business. There were 48 responses in total.

In order to report the findings simplistically, responses were categorized into seven categories such as newspapers, fliers, etc. Each constructed category was recorded by at least two respondents. These descriptors are intended to efficiently capture the nature of each statement. An individual statement may have been categorized in more than one category. For example, a statement such as "billboards & newspapers." would have been classified in both "billboards" and "newspaper". Results showed the largest media producing best results was word-of-mouth. Recall that word-of-mouth in an earlier section of this paper referred to dealing with mobile phones and social media. This avenue should be studied.



What percent of your sales is spent on marketing and media? (Q39)

Participants were asked to write-in this information. All but one respondent reported spending 25 percent or less of sales on marketing and media. A large number of respondents stated that they spent no funds on marketing media.

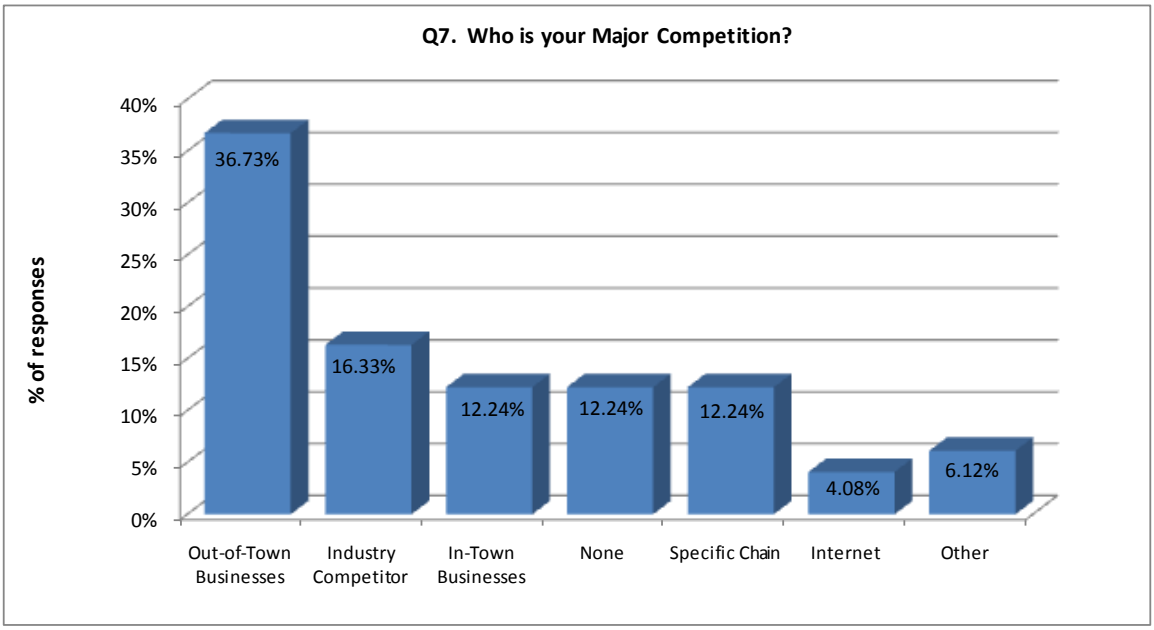


Other Businesses – Competition and Complements

▪ *Competition*

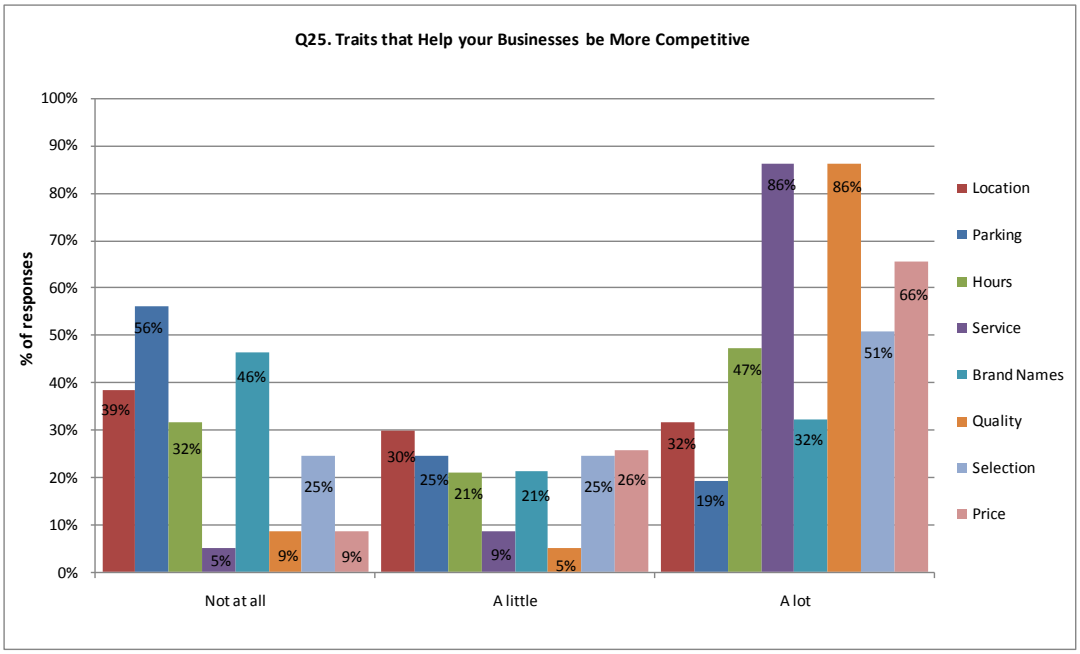
Who do you see as a major competition (local or out of town)? (Q7)

This was an open-ended question. Participants were asked to write-in their major competitors. In order to report the findings simplistically, responses were categorized into seven categories such as internet, specific chain, etc. Each constructed category was recorded by at least two respondents. These descriptors are intended to efficiently capture the nature of each statement. In some cases the respondent may have provided more than one competitor. A majority of respondents felt that out-of-town businesses were their major competitor.



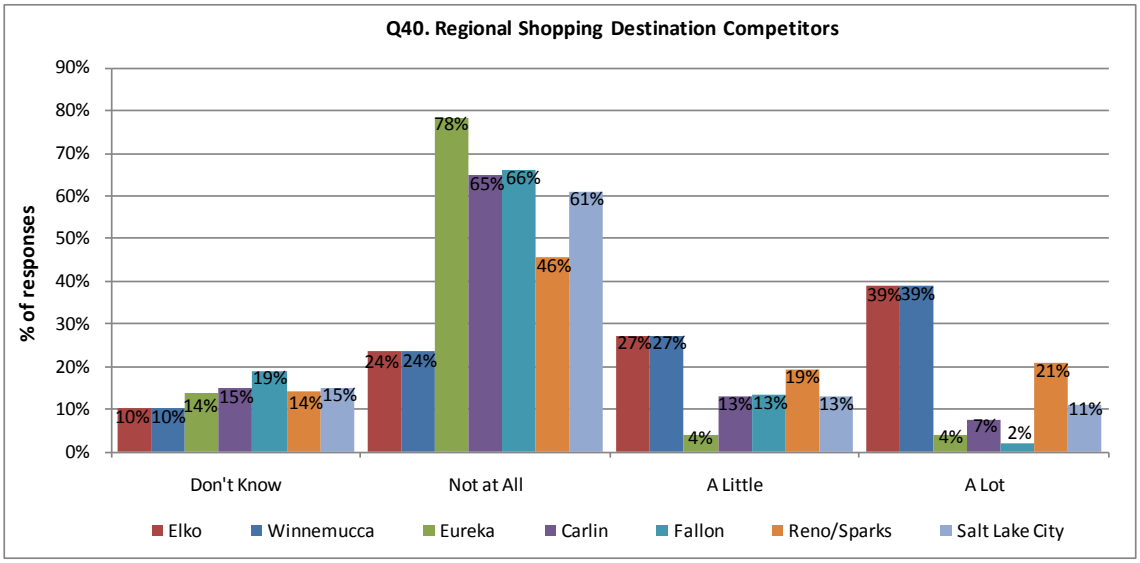
Do the following traits help make your business more competitive? (Q25)

Participants were asked to choose the degree ("A lot", "A little", "Not at all") to which each characteristic bolstered their competitiveness. "Quality" (86 percent) and "Service" (85 percent) were reported to have the largest impact on competitiveness, while "Parking" and "Brand Names" appeared to have the least competitive influence.



Thinking regionally, how much do you compete with the following shopping destinations?? (Q40)

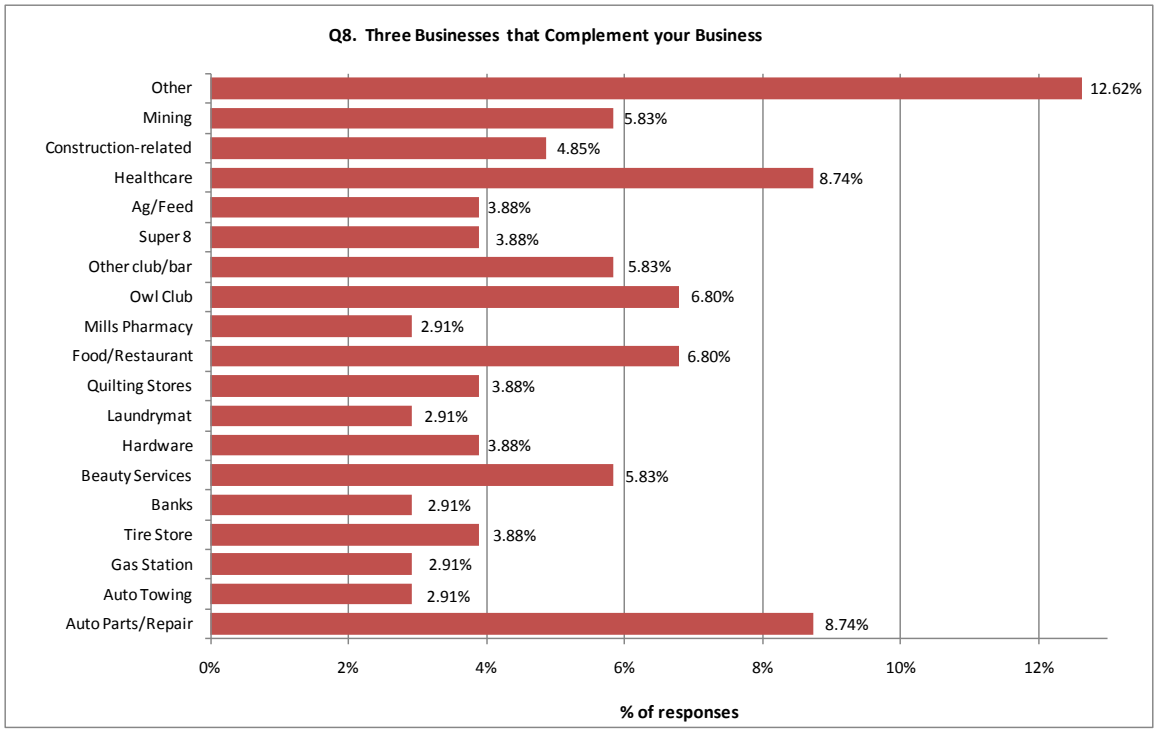
Participants were asked to choose the degree (e.g. "A lot", "Don't Know") to which each location competes with Battle Mountain businesses for consumers. Elko and Winnemucca were reported to be the most competitive areas with 66 percent of respondents selecting "A Little" or "A Lot" for these areas. Eureka, Fallon, and Carlin were reported as the least competitive with respondents selecting "Not at All" 78 percent, 66 percent, and 65 percent of the time respectively. It should be noted that Elko and Winnemucca have big-box retail stores.



▪ *Complements*

What THREE businesses complement your businesses the most? (Q8)

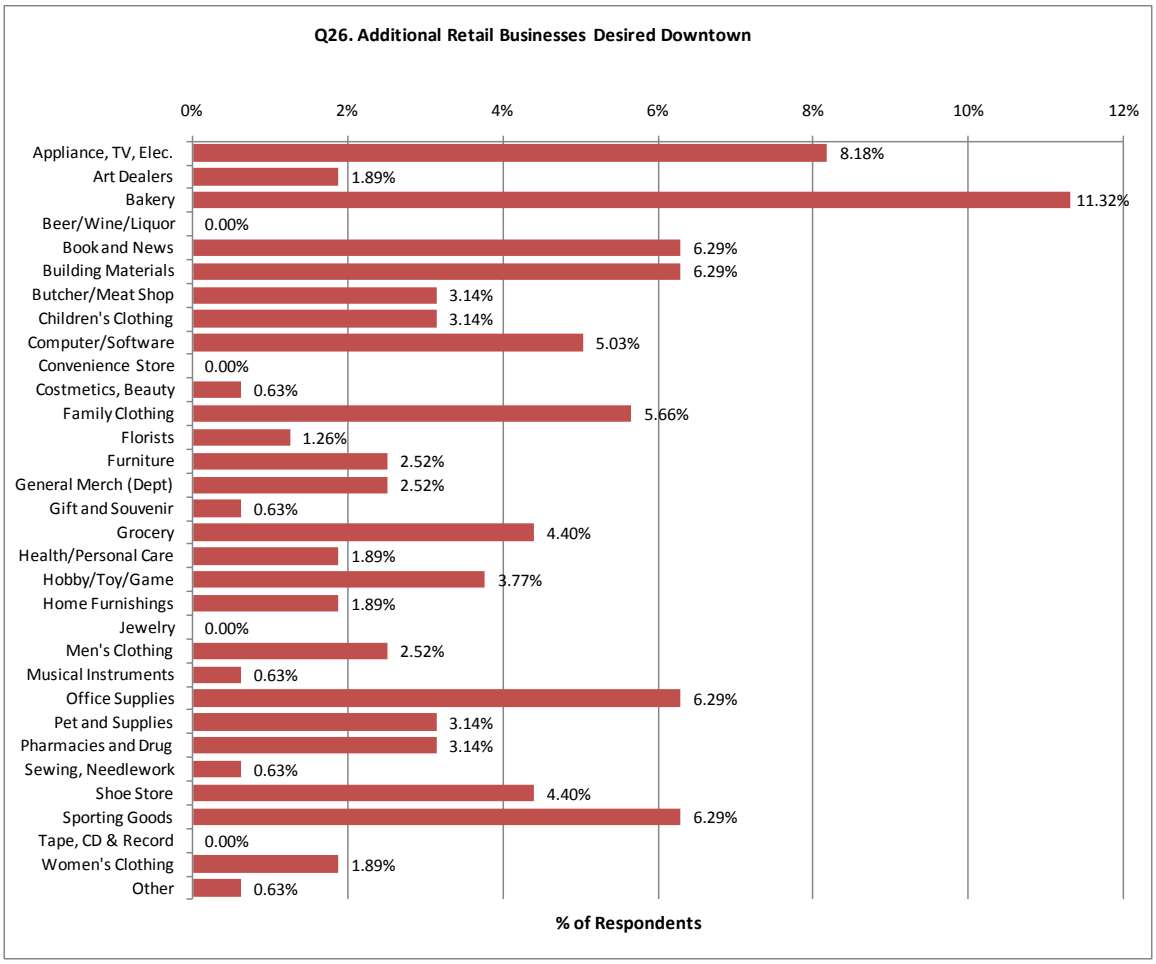
This was an open-ended question. Participants were asked to write-in three complementary businesses. The question did not specify whether general (restaurant) or specific ("Joe's Diner") businesses should be listed. A wide variety of general (restaurant) and specific ("The Owl Club") businesses were listed. The graph below reflects responses given by three or more respondents. Specifically named businesses represent only that business. Generally named businesses may or may not contain specifically named businesses recorded by less than three respondents.

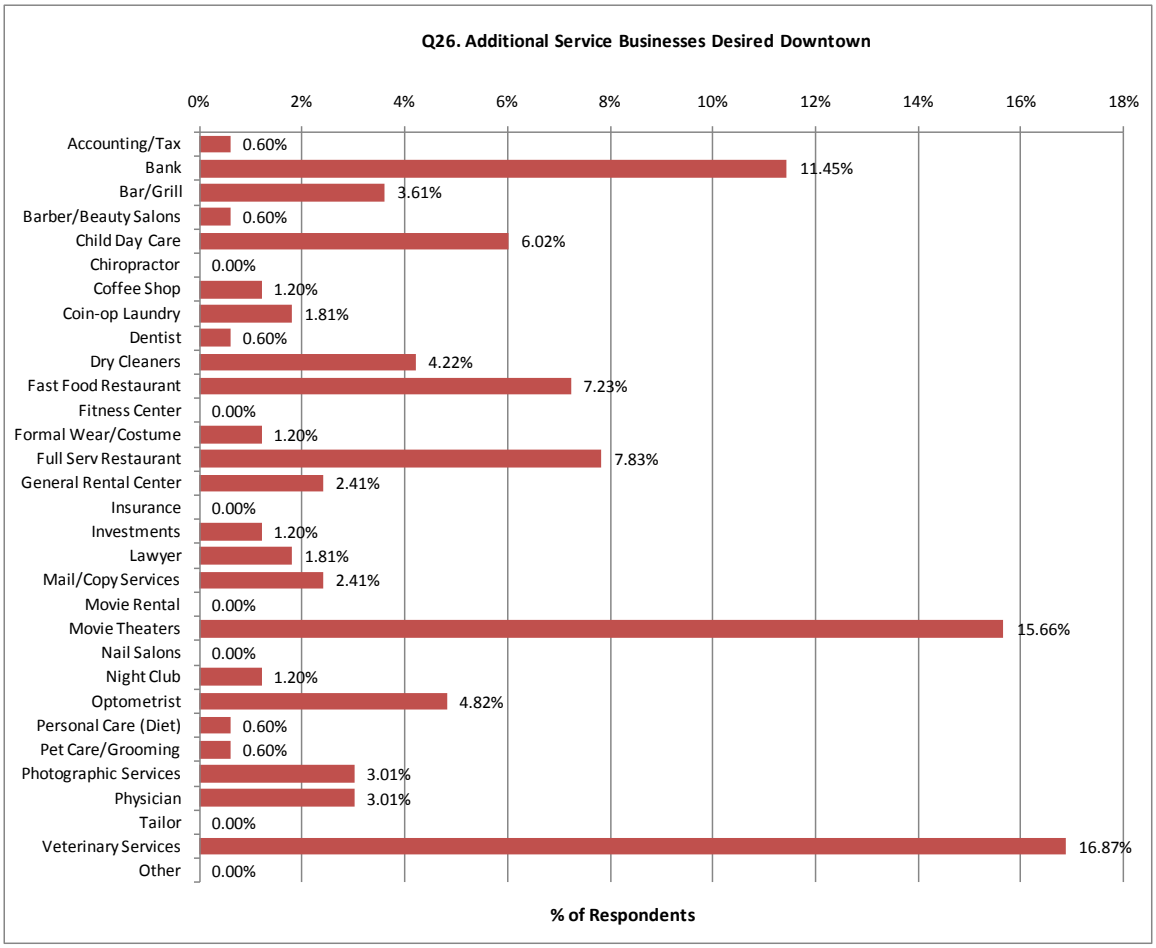


What FOUR additional businesses would you most like to see downtown? (Q26)

This was a two-part question. Participants were first asked to select four of 32 types (including write-in "Other" type) of retail businesses that are desired downtown. Next they were asked to select four of 31 types (including write-in "Other" type) of service businesses that are desired downtown. Responses were excluded for respondents selecting more than four types of retail businesses or more than four types of service businesses. One hundred and sixty-seven "Retail Businesses" were recorded with a response rate of 66.27 percent. One hundred and seventy "Service Businesses" were recorded with a response rate of 67.46 percent.

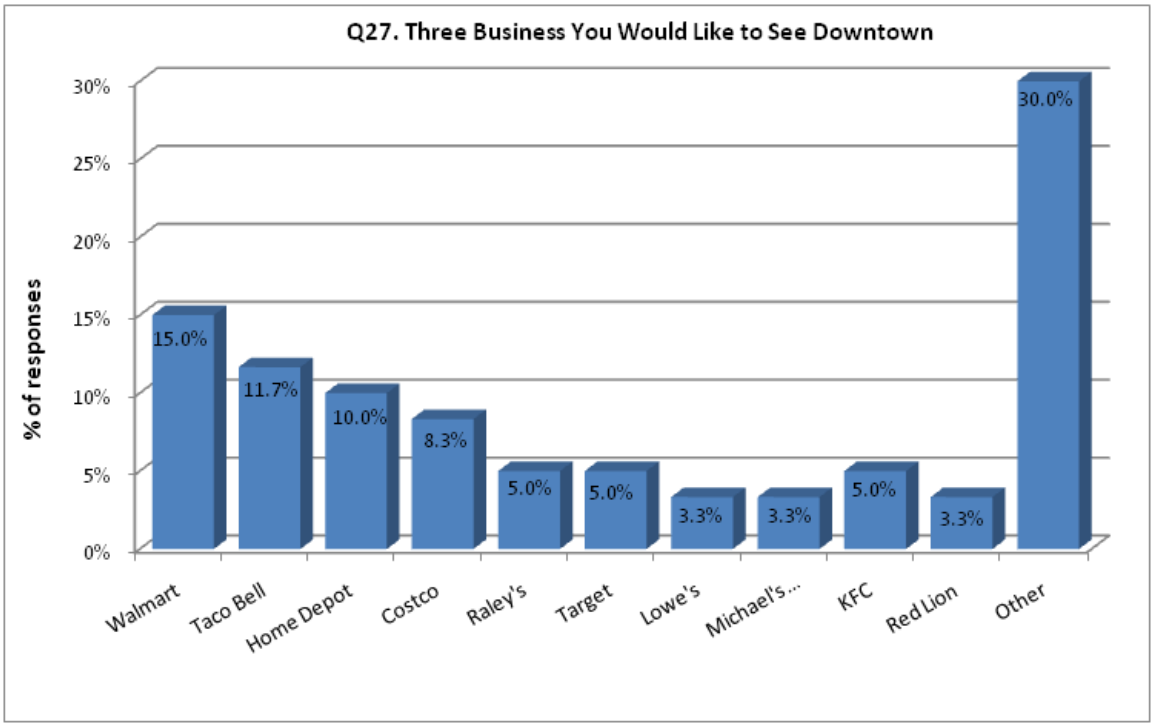
A bakery and appliance, television and electronic retail store were the highest two retail stores desired in Battle Mountain. For desired service business, the top two service businesses desired were veterinary services and movie theaters.





Name up to THREE businesses you would like to see come to downtown? (Q27)

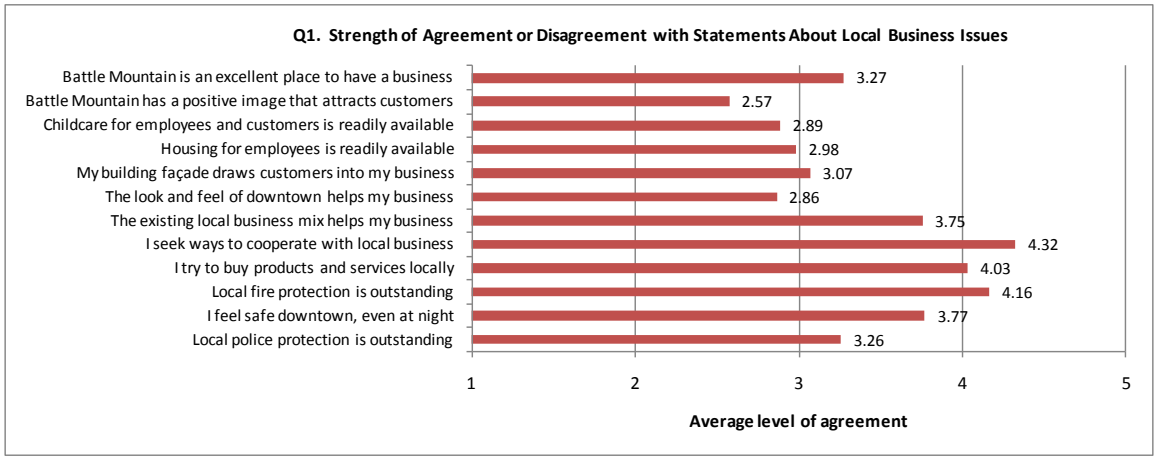
This was an open-ended question. Participants were asked to write-in three complementary businesses. The question specified that a specific ("Joe's Diner") name or chain should be listed, thus general business responses were excluded. The exclusion rate averaged 28.05 percent across the three opportunities to list a business name. Twenty-five respondents provided at least one business name, with an average response rate of 33.33 percent. One hundred and three responses were provided in total. "Other", businesses not specifically named, received the highest responses. As to firms named, Walmart received the highest response followed by Taco Bell and Home Depot.



Community Perspectives

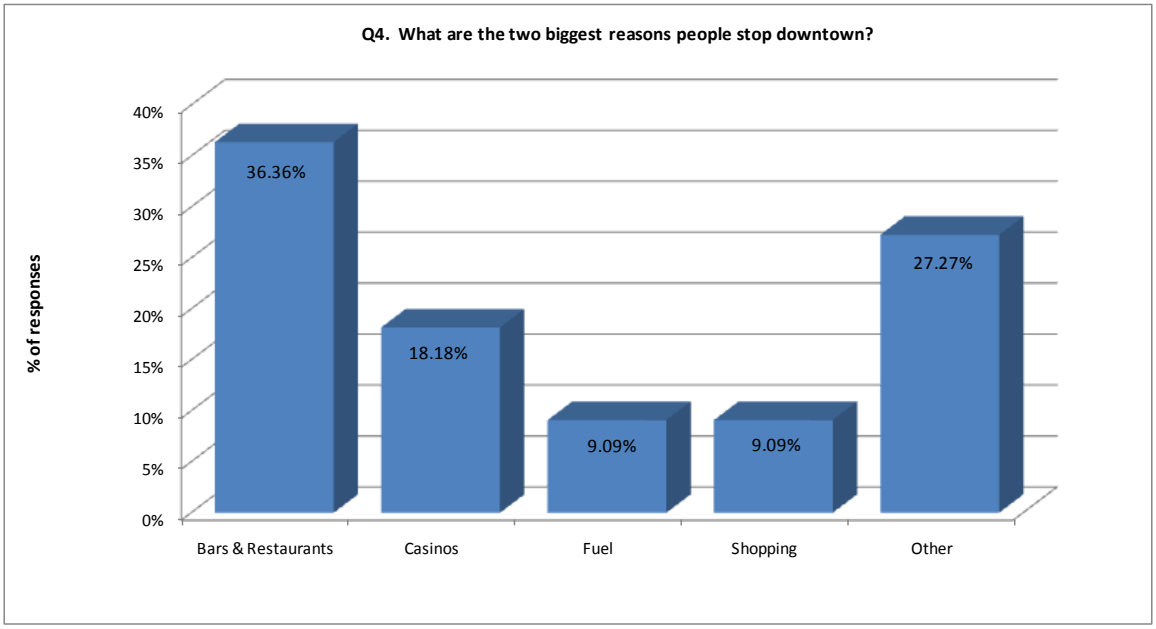
<u>How strongly do you agree or disagree with the following statements? (Q1)</u>

Participants were asked to state the degree to which they agreed or disagreed with a variety of statements about Battle Mountain as it relates to the business environment. Answers ranged from "Strongly Disagree" (value = 1) to "Strongly Agree" (value = 5). The statement with the highest agreement was, "I seek ways to cooperate with local businesses." The statement with the strongest disagreement was, "Battle Mountain has a positive image that attracts customers." This was probably from the New York Times article and its impact on Battle Mountain.



What are the TWO biggest reasons people stop downtown? (Q4)

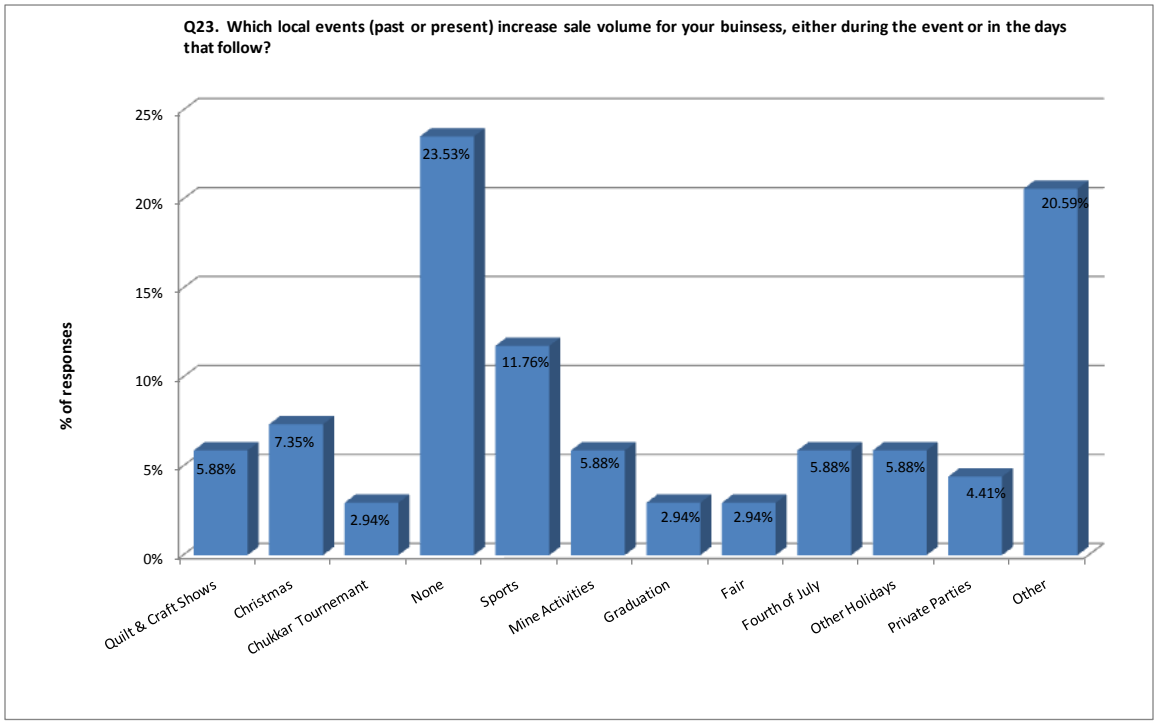
This was an open-ended question. Participants were asked to provide two reasons (e.g. attraction, activity) why people visit downtown Battle Mountain. The highest response as to why people stop in downtown Battle Mountain was for bars and restaurants. Shopping had the lowest, which impacts local retail activities.



Which local events (past or present) increase sales volume for your business, either during the event or in the days that follow? (Q23)

This was an open-ended question. Participants were asked to provide up to five events that boost sales in downtown Battle Mountain. At least 39 respondents provided at least one event, only two respondents provided five events. Sixty-eight responses were provided in total.

In order to report the findings simplistically, responses were categorized into 12 categories. Each constructed category was recorded by at least two respondents. "Other" represents events listed only once. It should be noted that "None" was repeated by the largest percentage of respondents. Additionally, one respondent noted that events take away business from downtown merchants – another respondent noted that people do not go to downtown Battle Mountain to shop. However, one of the positive responses was sports, which is related to Battle Mountain High School activities.



<u>Which downtown buildings could be more productively used to create more economic activity for the district? (Q28)</u>

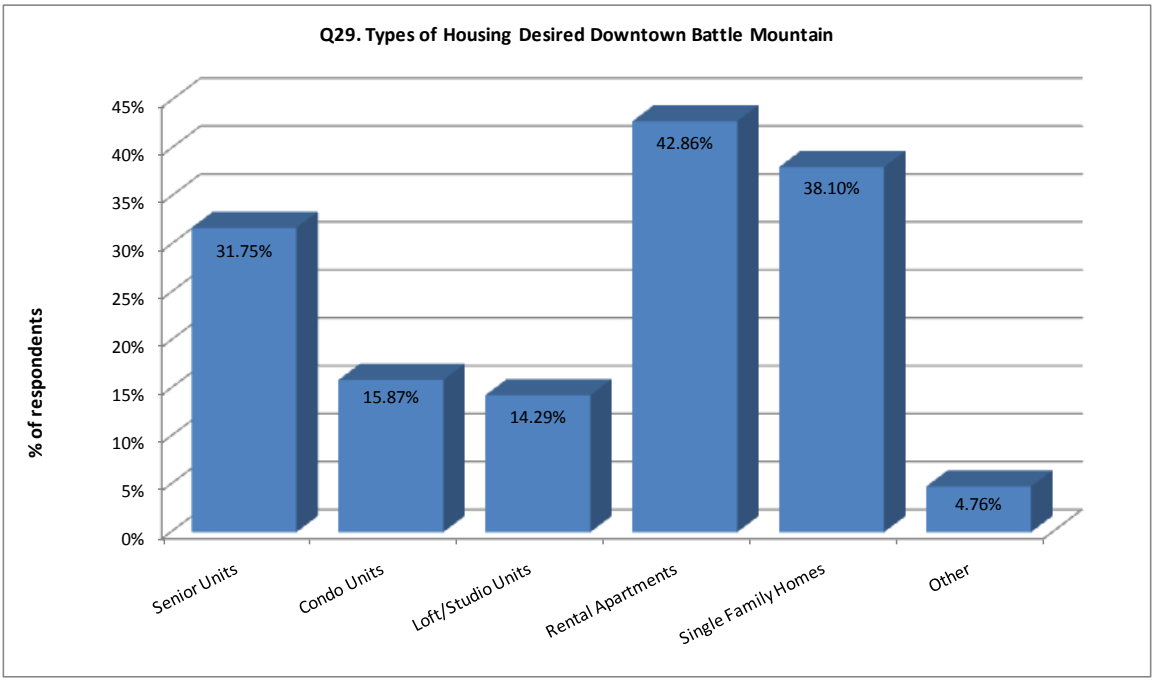
This was a two-part open-ended question. Participants were first asked to suggest a specific location that could be improved to increase general economic activity in Battle Mountain. Then, participants were asked to suggest for what the improved space could be better used. Response was relatively low for both parts. Twenty-four respondents provided at least one specific location – a response rate of 38.1 percent. Only 17 respondents provided suggestions for site use – a response rate of 26.98 percent.

The most frequent suggestion for specific location improvement was the Lemaire Building, written in by 33.33 percent of the respondents. This was closely followed by a more general suggestion of "anything on Broad or Front streets" – provided by 29.17 percent of respondents.

The most frequent usage suggestion was "any business" provided by 17.65 percent of respondents. This was followed by "something for kids" suggested by 11.77 percent of respondents.

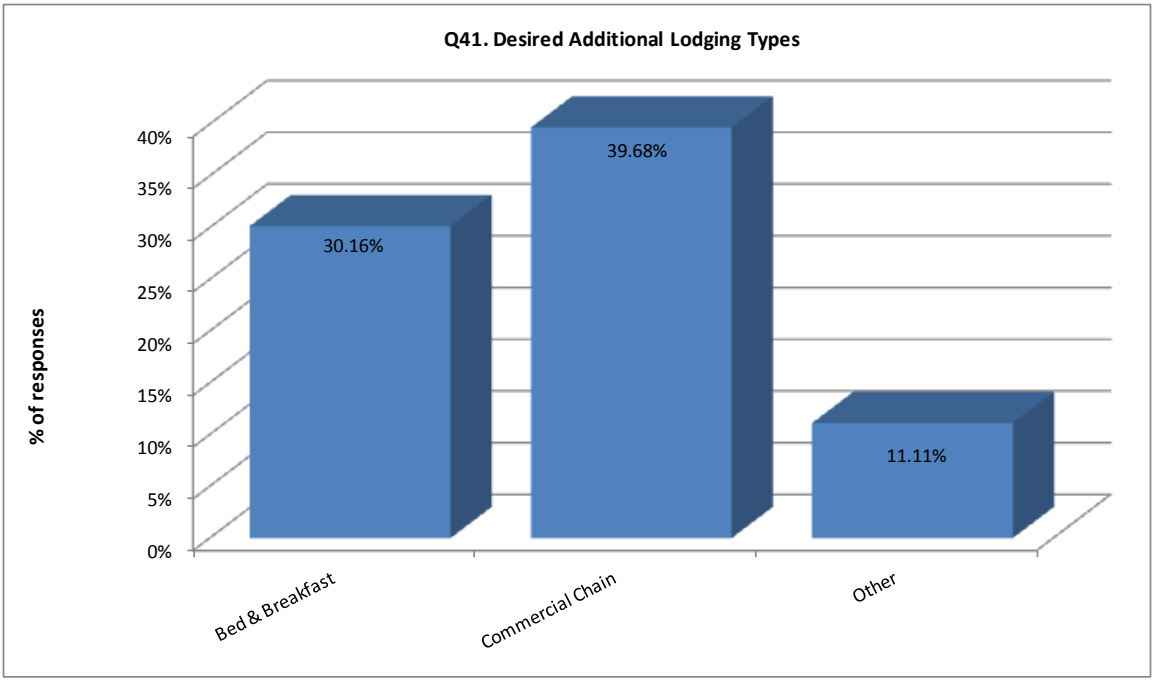
What types of housing would you like to see added to downtown? (Q29)

Participants were asked to select all housing types they wished to see developed in downtown Battle Mountain. The graph below reflects all housing types available for selection within the written survey. Rental apartments and single-family homes were the highest selected housing types desired in downtown Battle Mountain.



What additional types of lodging accommodations are needed in Battle Mountain? (Q41)

Participants were asked to select all lodging types they wished to see in Battle Mountain. The graph below reflects all housing types available for selection within the written survey. "Other" lodging types suggested included campground, "top-of-the-line" hotel, and temporary studio housing for mine workers. The highest response was for "Commercial Chain" followed by "Bed and Breakfast".



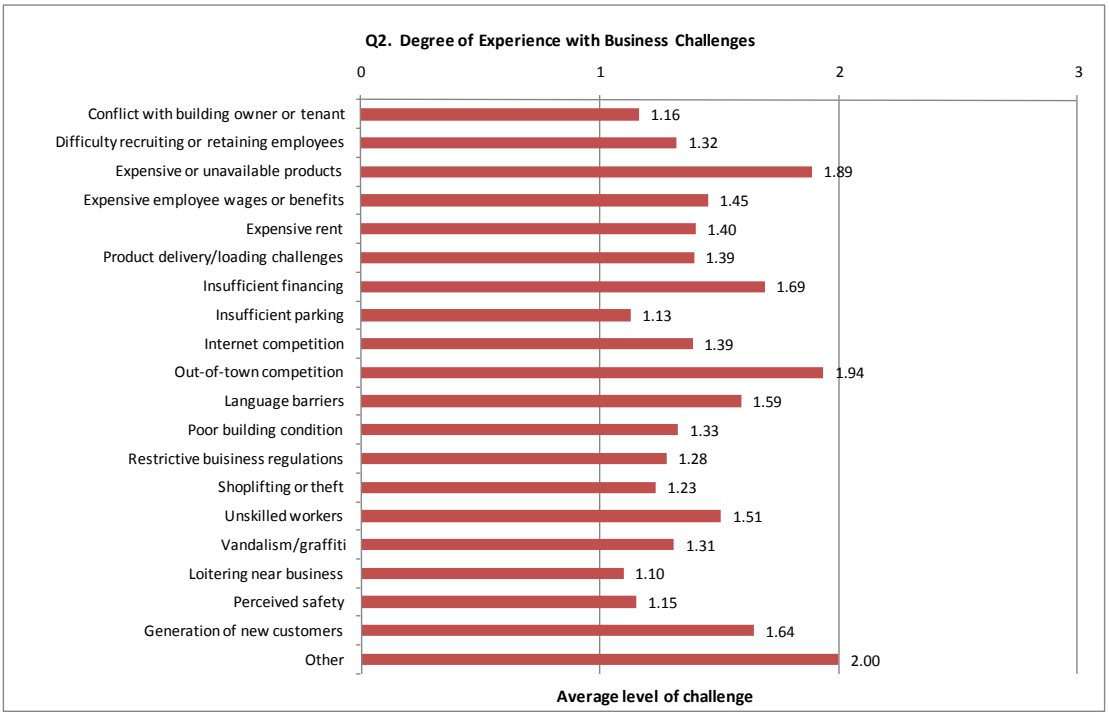
Business Challenges and Desired Assistance

- Challenges

<u>Please rate the degree to which you are experiencing the following business challenges. (Q12)</u>

Participants were asked to state the degree to which their business was challenged by a variety of issues such as crime, production requirements, and trade issues. Answers ranged from "Don't Know" (value = 0) to "Major Challenge" (value = 3).

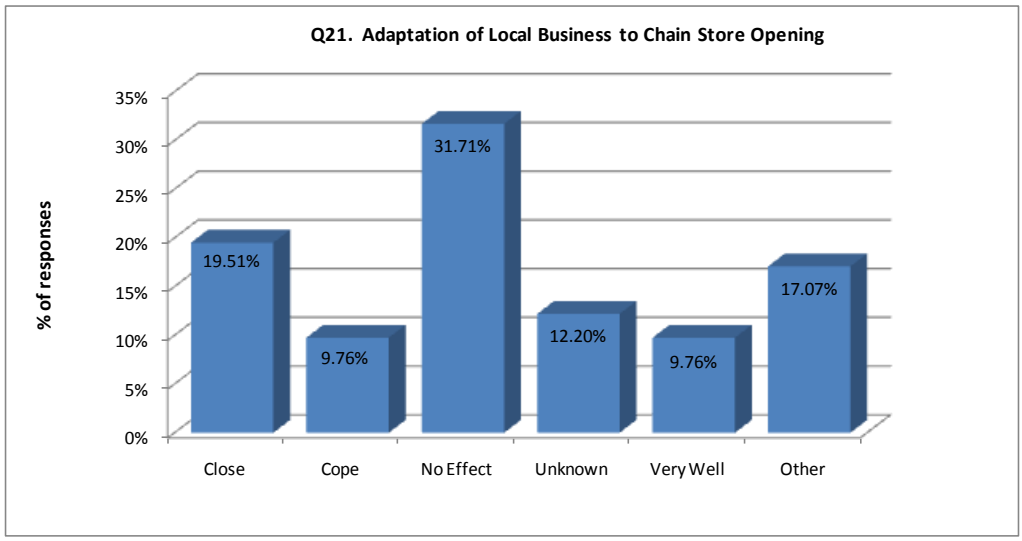
The values in the graph below represent the average degree of challenge experienced by the given statement. "Other" written answers provided included "local advertising", "competition with local businesses", and "local mining doesn't support our business". Of those statements enumerated, the two major challenges reported were "Out-Of-Town Competition" and "Expensive and Unavailable Products". The lowest perceived challenges were "Loitering Near Businesses" and "Insufficient Parking".



<u>If additional chain stores were to open in the area how would you adapt? (Q21)</u>

This was an open-ended question. Participants were asked to discuss how they would adapt to more chain stores opening in the Battle Mountain area.

In order to report the replies simplistically, responses were categorized into six categories. Each constructed category was recorded by at least two respondents. "Other" represents events listed only once. The highest response by Battle Mountain businesses was "No Effect" followed by businesses stating the closure of Battle Mountain businesses.

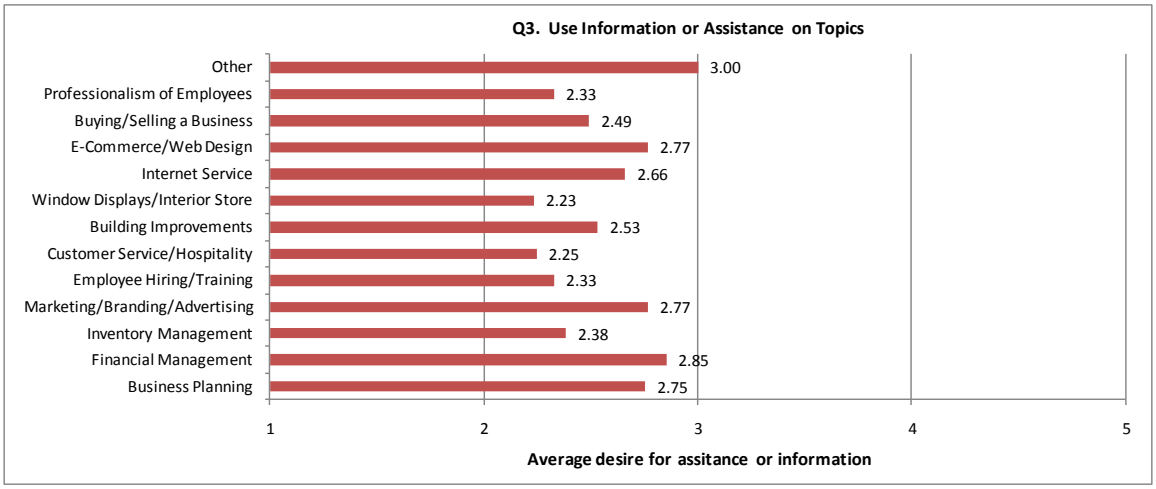


▪ *Assistance*

Could you use information on or assistance with the following topics? (Q3)

Participants were asked to state their level of interest in gaining assistance with a variety of general business topics (e.g. marketing, web design, financial management). Answers ranged from "Definitely Not" (value = 1) to "Definitely" (value = 5).

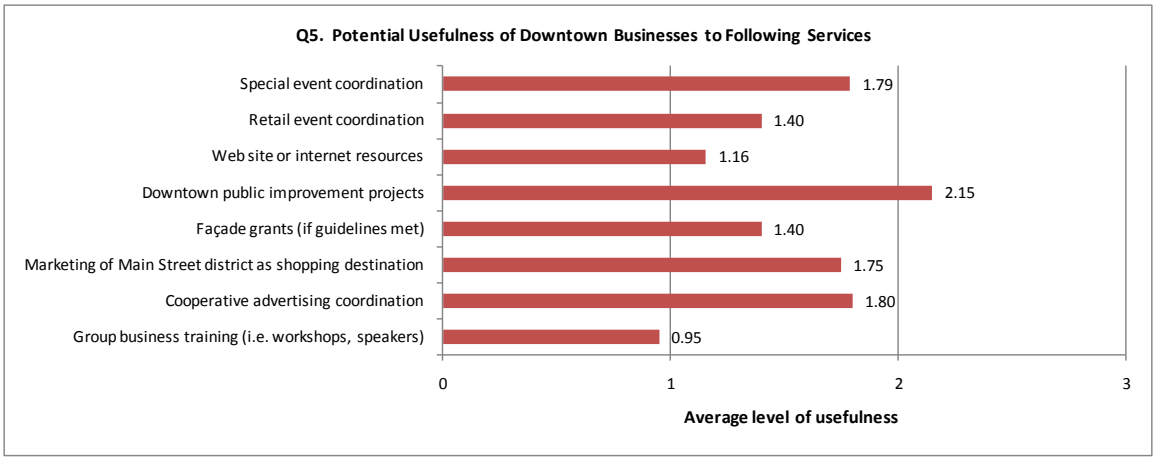
The values reflected in the graph below represent the average level of interest for the given statement. The three categories with the highest need were "Financial Management", "Marketing/Branding/Advertising" and "E-Commerce/Web Design". "Other" had the highest response, which could be a combination of all topics.



How useful to your downtown business are (could be) the following services? (Q5)

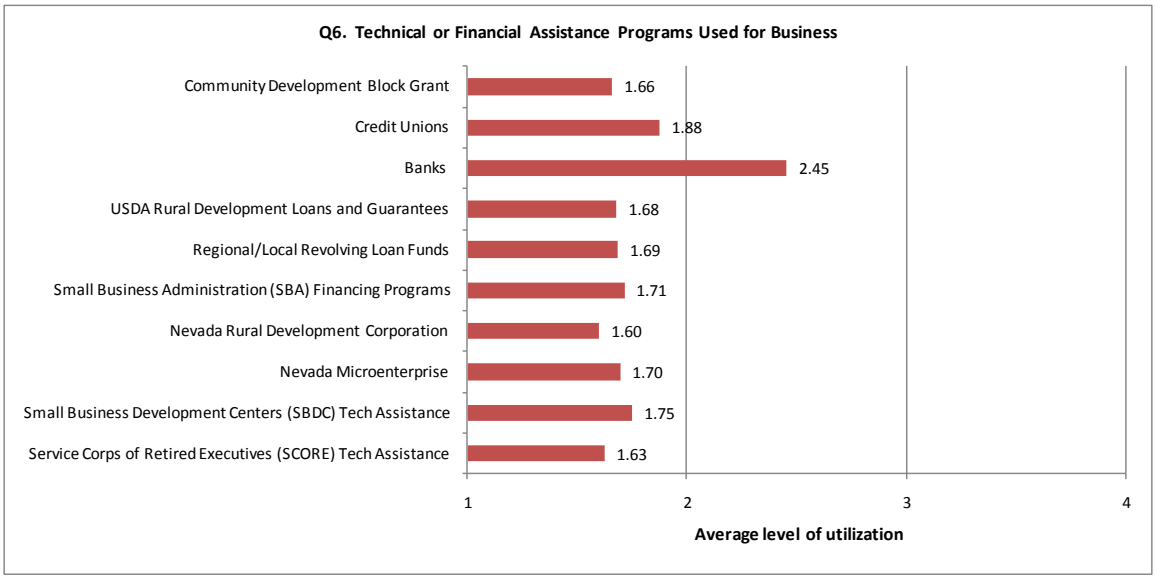
Participants were asked to state the level of usefulness of a variety of support services such as cooperative marketing and community improvements. Answers ranged from "Don't Know" (value = 0) to "Very Useful" (value = 3).

The values reflected in the graph below represent the average level of usefulness for the given service. The highest downtown activity was "Downtown Public Improvement Projects" followed by "Cooperative Advertising and Special Events".



Which technical or financial assistance program(s) have you used for your business? (Q6)

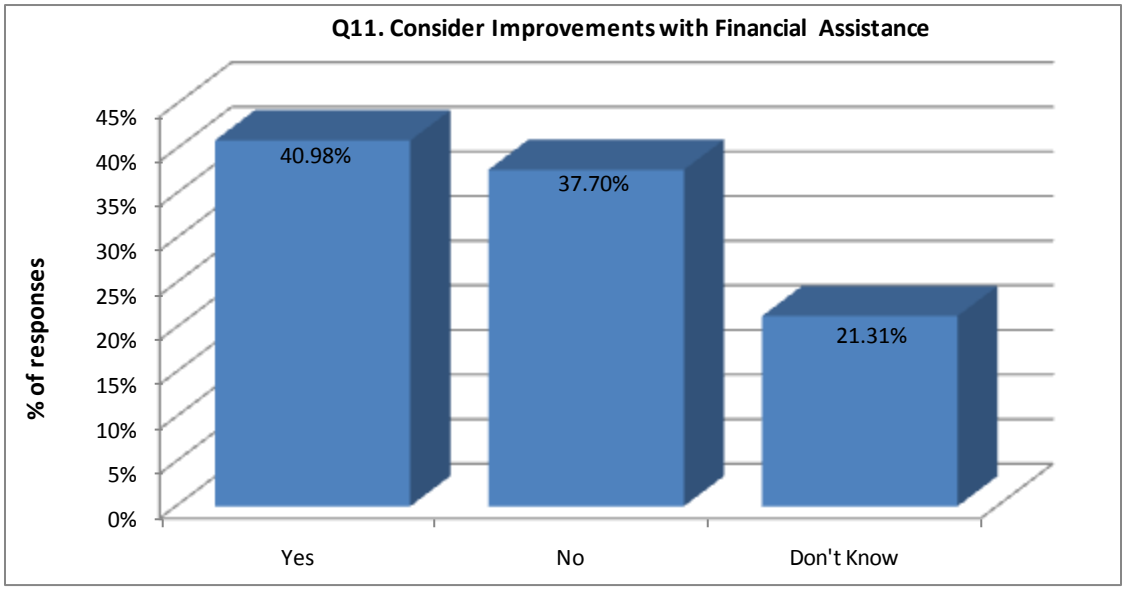
Participants were asked to state whether or not they had used and/or were familiar with a variety of financial assistance programs. Answers ranged from "Won't Use" (value = 1) to "Used in Past Year" (value = 4). Banks were reported as being used the most for technical and financial assistance followed by credit unions and Small Business Development Center technical assistance.



If financial assistance were available, would you consider building improvements such as façade work or new signage? (Q11)

Participants were asked to state if they would be interested in taking advantage of available improvement programs (hypothetically). Approximately 41

percent of Battle Mountain business operators replied that they would consider improvements with financial assistance, while 38 percent would not.



Comments

There was no final section included for respondents to record general thoughts or comments. However, several respondents wrote in comments nonetheless. The following is a sampling of some comments of interest.

- Owner is only employee. Out-of-business due to the economy.
- The business I manage is part of a larger corporation. This business sells to other businesses.
- In business since 1986 (welding and manufacturing).
- Battle Mountain doesn't do a thing to help current businesses or to promote getting new business. They have turned down a few businesses wanting to open here also….I feel no business is going to be supported as people go to cheap shopping [elsewhere].

Conclusions

- The majority of businesses in Battle Mountain have been owned for either a relatively short amount of time (less than five years) or a very long time (more than 20 years).
- The combined number of employees and owners for Battle Mountain businesses is quite small – the weighted averages are 1.2 fulltime, 1.78 part-time, and 1.36 seasonal.
- Operating hours barely fluctuate between the busy and slow seasons. The average number of operating hours reported for the busy season was 11.27 and for the slow season, 11.43.

- The majority of business owners responding, 63.16 percent, had no plans to either expand or reduce operations. For those that did plan on changing operations, they planned on expanding outside of the downtown area.
- Walmart is the most desired chain.
- The most desired retail business for downtown Battle Mountain is a bakery.
- The most desired service business for downtown Battle Mountain is a veterinarian.
- Business owners reported men and women, all age groups, and all income levels as important consumer segments. The only reported segment differentiation related to residence. Owners reported that Battle Mountain residents were very important while tourists and Californians were not important.
- Battle Mountain business owners engage in very little e-commerce including maintaining business websites and/or online sales.
- In general, the reporting owners said that they spent 25 percent or less of their sales revenue on marketing expense. Newspaper and word-of-mouth marketing are the most commonly utilized marketing tools.
- Out-of-town businesses were reported as the number one source of competition, as well as the biggest challenge to operations. Elko, Winnemucca, and Reno/Sparks exert the biggest draw.
- Owners disagreed with statements such as "Battle Mountain has a positive image that attracts customers" and "The look and feel of downtown helps business".
- Bars and restaurants are the strongest downtown attraction.
- Owners reported that special events do not help bolster downtown business.
- Battle Mountain business owners reported very little interest in receiving information or assistance to improve or strengthen their operations. The small amount of interest shown was for information or assistance with financial management or e-commerce.
- Owners reported using very few, if any, assistance measures such as grants or loans. Banks were the only reported source of assistance used.
- Owners seemed wary or unsure of whether they would consider business improvements if financial assistance were available. Forty-one percent said they would be interested, 38 percent said they would not be interested, and 21 percent said they were unsure.

SECTION III

NEEDS AND PERSPECTIVES OF BATTLE MOUNTAIN CONSUMERS

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NEEDS AND PERSPECTIVES OF BATTLE MOUNTAIN CONSUMERS

Battle Mountain, an unincorporated municipality, is the county seat and largest community in Lander County, Nevada. Historically, the Battle Mountain economy has been prone to "boom and bust" cycles influenced largely by regional mining activity. This survey sought to understand consumer preferences regarding current and potential businesses so these preferences may be incorporated in local economic development to encourage a healthy and enduring retail sector in Battle Mountain.

Survey Overview

This survey was designed in part using previous consumer preference surveys generated by a variety of other land grant cooperative extension programs. It was then reviewed and modified to best address consumers' interests specific to the Battle Mountain community. A separate survey targeted at Battle Mountain business owners was conducted just prior, and while few questions overlap, it was intended to be analyzed in conjunction with the consumer survey.

Types of Questions

- Battle Mountain shopping and dining patterns: where, when, and why [current and ideal].
- General shopping and dining patterns: where and why.
- Preferences for shopping location across types of goods.
- Preference demographics: media outlets, activities, community ideals.
- General demographics: age, education, income, etc.

Survey Distribution and Response

Because the population of Battle Mountain is relatively small (2,871 as of the 2000 census), the entire population was targeted for the consumer survey. The Dillman Method was employed across all stages of survey design and implementation (Dillman et al., 2009).

The total number of consumers surveyed was 1,682. The addresses were obtained from Allegra Printing and reflect all current Battle Mountain addresses. Each address was sent a single survey. The first survey round was implemented by mail on July 16, 2010. On August 17, 2010, a reminder postcard was sent to 1,316

addresses that had either not yet responded or for whom no invalid address notification had been received. In lieu of a formal notification letter mailing (the Dillman Method preference), notifications were posted in the local paper, the *Battle Mountain Bugle*, prior to both the mailing of the initial survey and the reminder postcard.

The total number of surveys returned during the initial round was 266 – a survey response rate of 15.82 percent. An additional 39 surveys were received after sending the reminder postcards. This increased the overall response rate to 18.13 percent (305 completed responses).

Survey Response

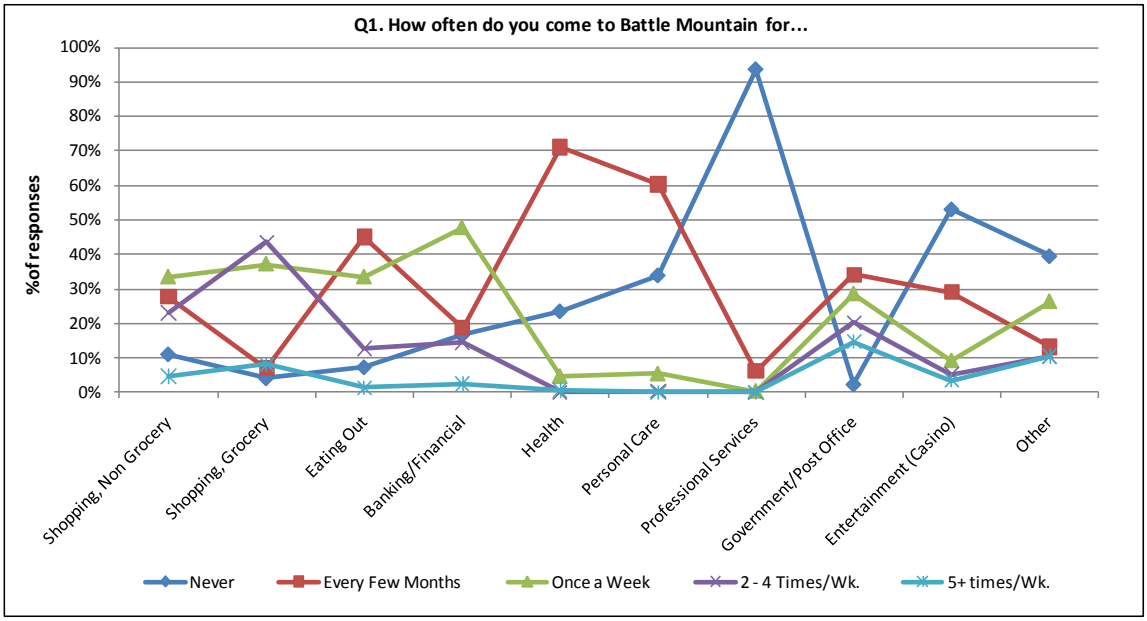
Battle Mountain Shopping Patterns: Where, When, and Why

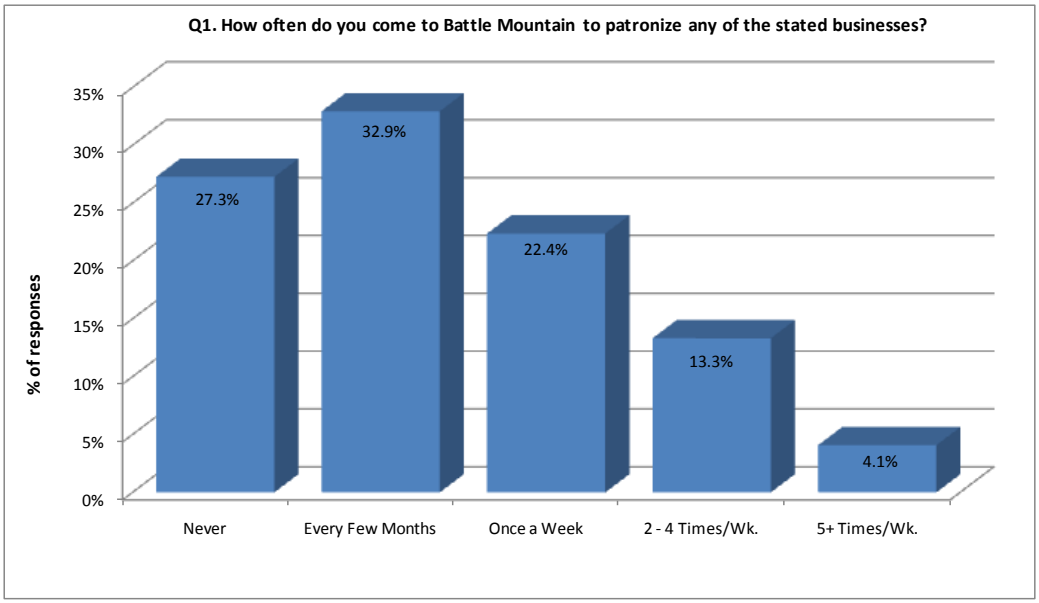
- *Current Activity*

How often do you come to Battle Mountain for the following? (Q1)

Participants were asked to choose only one visit frequency for each of ten Battle Mountain business types – frequencies ranged from "Never" to "5+ times/wk".

In every category except "Shopping, Grocery", the data reflected that residents were patronizing local businesses once a week or less. "Shopping, Grocery" businesses received the most local business with 2 to 4 visits per week. Across all categories, 60.2 percent of residents reported patronizing all Battle Mountain business types every few months.

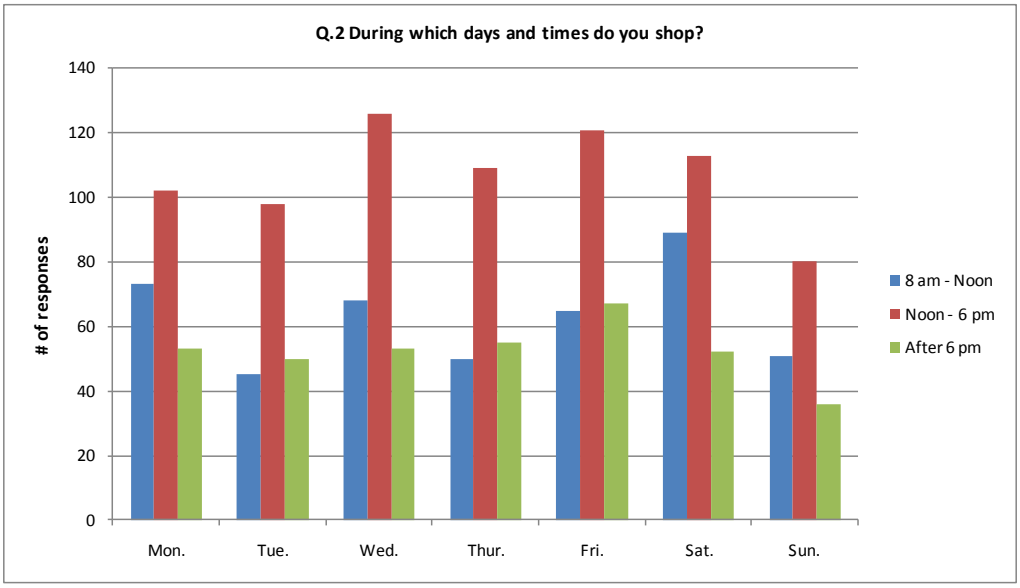


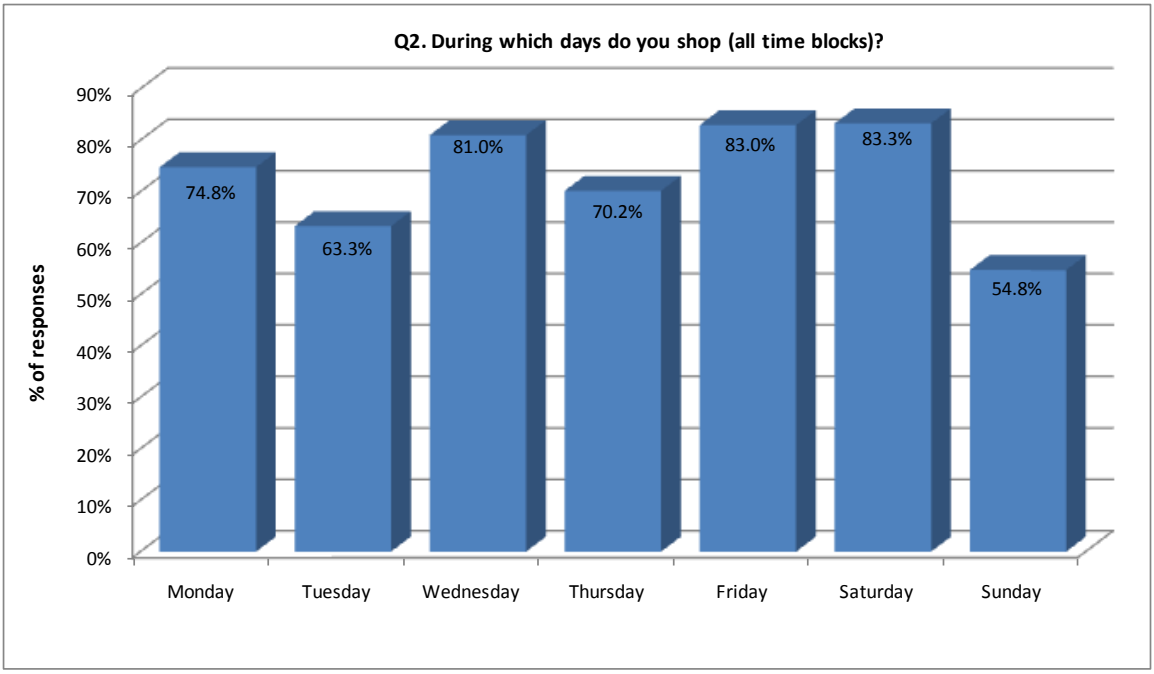


<u>During which of the following days do you shop? (Q2)</u>

Participants were asked to mark all applicable time blocks as to when they shopped. Time blocks were first categorized by day, then by "8 am to noon", "noon to 6 pm", and "after 6 pm". Unselected time blocks were assumed to be "No" responses, resulting in an overall response rate of 100 percent.

The most popular time to shop was reported to be "noon to 6 pm" regardless of the week day. The least popular time to shop was reported to be "after 6 pm", also regardless of day. Respondents indicated Saturday as the most popular day to shop regardless of time block, and Sunday as the least popular day to shop overall.



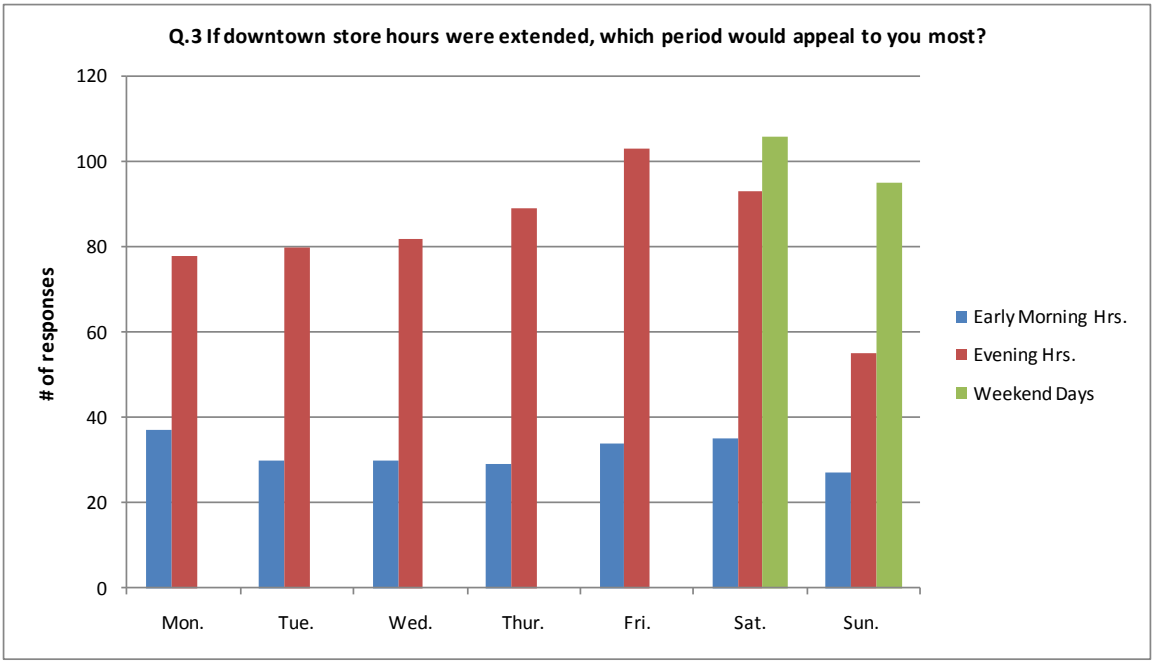


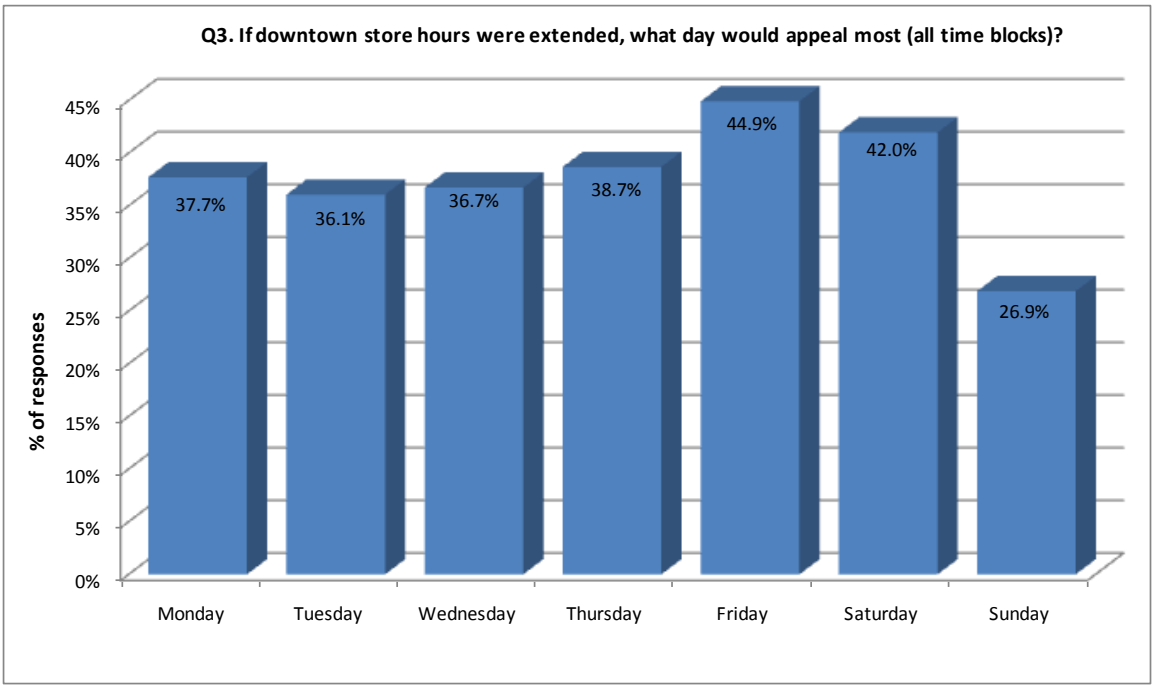
- *Ideal Activity*

<u>If downtown store hours were extended, which period would appeal to you most? (Q3)</u>

Participants were asked to mark all applicable time blocks they found most appealing – time blocks were categorized by day then by "early morning hours", "evening hours", and "weekend days". Unselected time blocks were assumed to be "No" responses.

Respondents indicated extended evening hours as desirable, both for weekdays and weekends. Extended Saturday hours was the most desired overall, regardless of time block. Early morning was the least desired time block to extend hours for any day, with Sunday early mornings being the least demanded time block. Extended Friday hours was the most demanded regardless of time block, with Sunday hours having the lowest demand for extended hours.



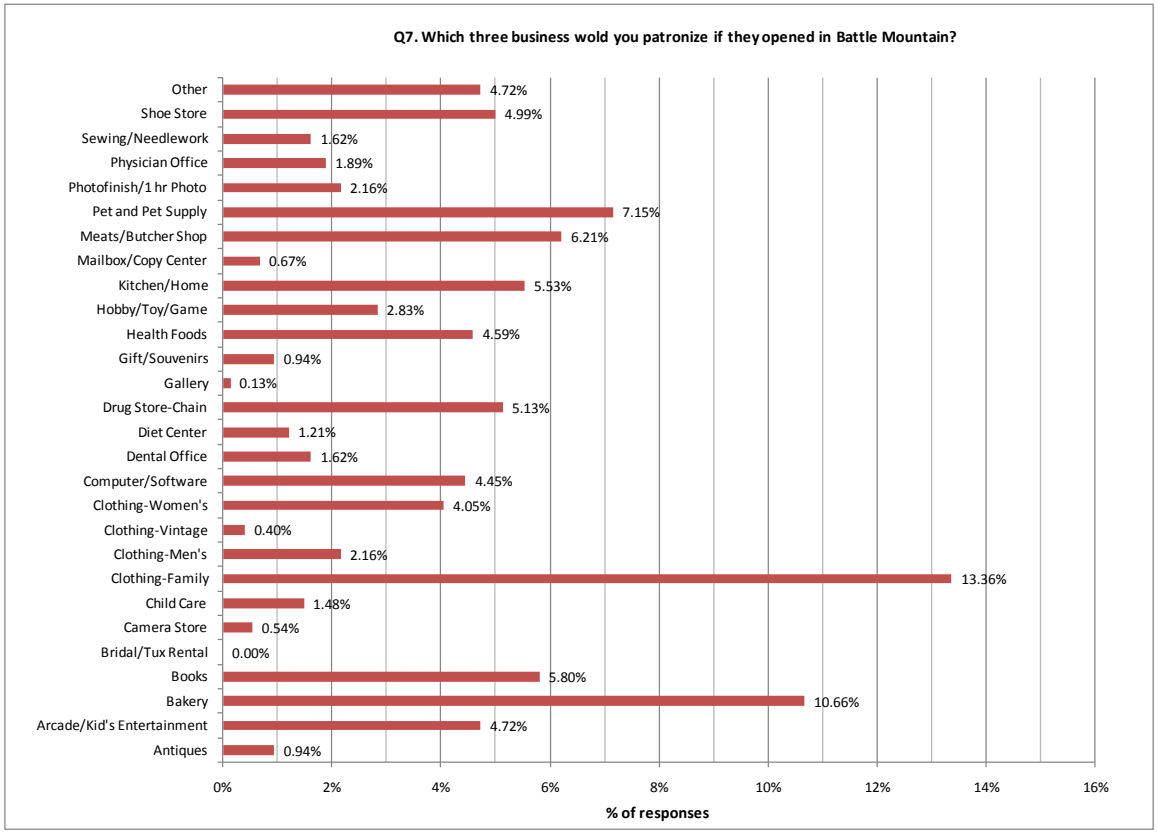


Which THREE businesses would you patronize if they opened in Battle Mountain? (Q7)

Participants were asked to mark up to three business types. Responses were excluded for respondents selecting more than three businesses – 6 percent of all original responses to this question were excluded from analysis below. Two hundred

and sixty-six respondents selected at least one business type – 87.21 percent response rate. A total of 741 responses were gathered for this question.

"Family clothing" was the most popular selection and "Bridal/Tux Rental" was the only business type not selected by any respondent. "Other" business types written in by three or more respondents included grocery (13), movie theater (9), Walmart (7), and restaurant (5).

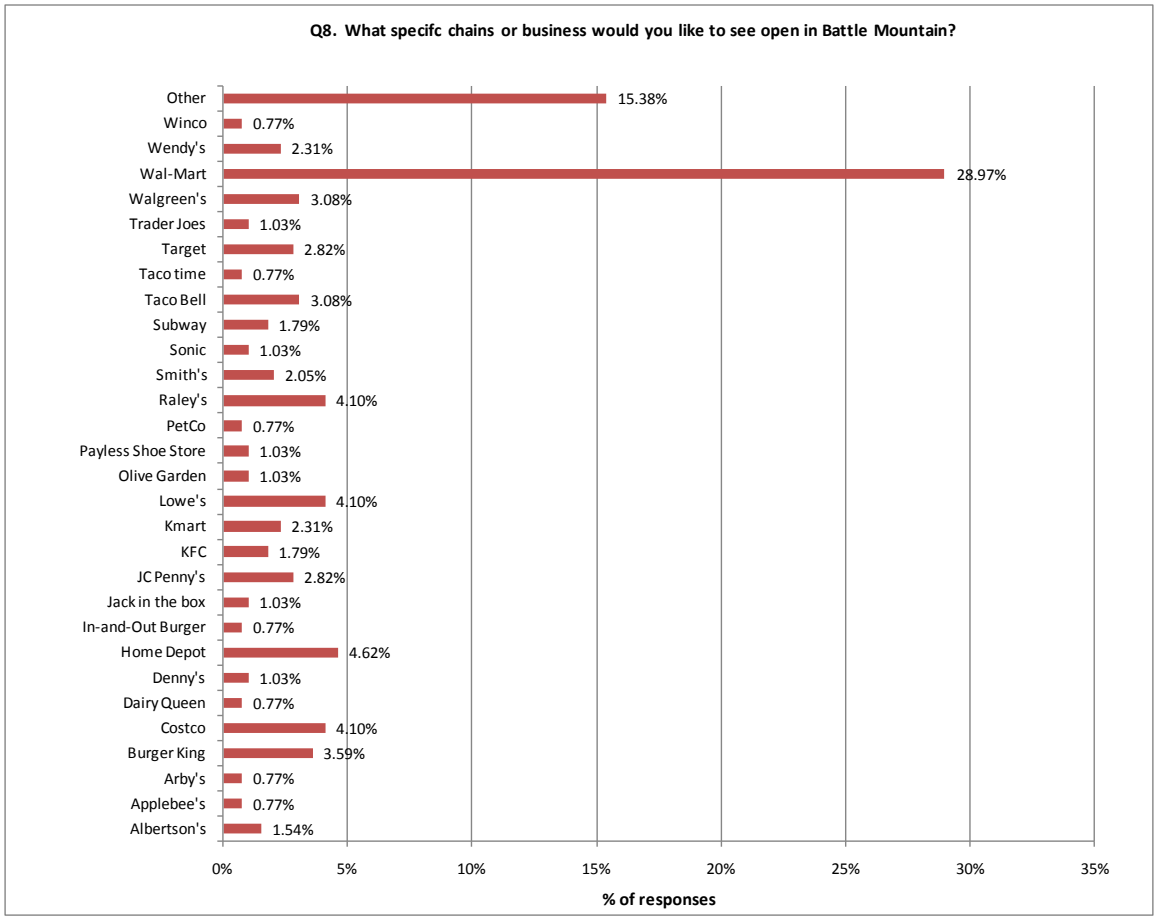


<u>Which TWO specific business names/chains you would like to see come to Battle Mountain? (Q8)</u>

This was an open-ended question. Participants were asked to write in the name of specific businesses they would like to have in Battle Mountain. Responses were excluded for respondents writing in more than two business names (5.98 percent of original responses to this question). In addition, general responses (i.e. "restaurant", "clothing store", etc.) were also excluded from the analysis (16.27 percent).

"Walmart" was the most popular business recorded by 28.97 percent of respondents. This outpaced the second most popular business selected, "Home

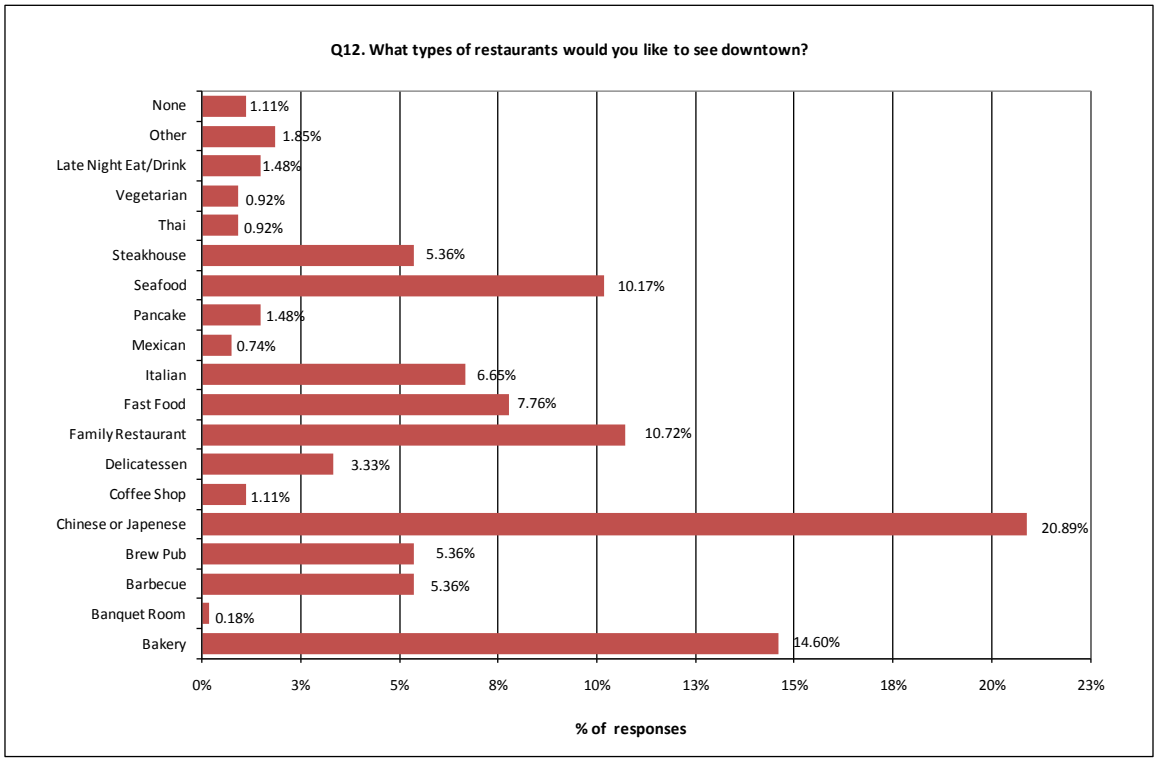
Depot", by 4.62 percent of respondents. The "Other" category reflects business names written in only once or twice. The top three business types named in "Other" were restaurants (30 percent), discount variety stores (10 percent), and grocery stores (8.33 percent). By contrast, the top three business types among the named businesses explicit in the graph, discount variety stores comprised 45.15 percent; restaurants, 25.15 percent; and grocery stores and home improvement stores, 10.30 percent each.



<u>What TWO types of restaurants would you like to see in Downtown Battle Mountain? (Q12)</u>

Participants were asked to mark up to two restaurant types. Responses were excluded for respondents selecting more than two restaurant types – 3.7 percent of all original responses to this question were excluded from analysis below. Two hundred and eighty-one respondents selected at least one restaurant type, a 92.1 percent response rate. A total of 541 responses were gathered for this question.

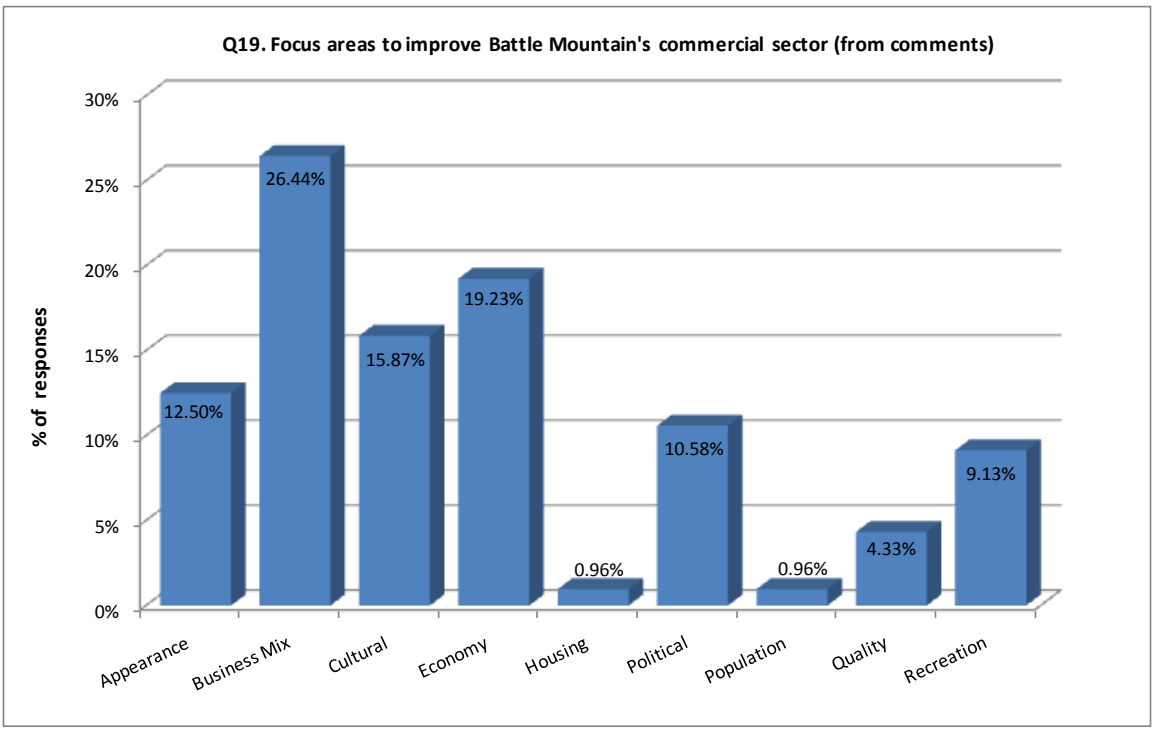
"Chinese or Japanese" was the most popular category and was selected by 20.89 percent of respondents. "Bakery" was the next most favorite at 14.6 percent, and "Family Restaurant" at 10.72 percent. The least desired restaurant type was "Banquet Room" selected by 0.18 percent of respondents. The "Other" category did not report any restaurant type more than once. "Other" restaurant types reported included Vietnamese, sports bar, and buffet.



<u>Please provide any additional comments you feel would help us improve the Battle Mountain commercial sector. (Q19)</u>

This was an open-ended question. Participants were provided four blank lines to write in suggestions for improving Battle Mountain's commercial sector. No responses were excluded because the question format did not contain response qualifiers. In order to report the findings simplistically, responses were categorized into nine categories such as appearance, economy, quality, etc. These descriptors are intended to capture the nature of each statement. An individual statement may be categorized in more than one category. For example, a statement such as "The restaurants here aren't very good and their prices are too high." were classified in both "economy" and "quality". At least 137 respondents answered this question, a 44.92 percent response rate.

"Business Mix" was the most commonly cited suggestion, offered by 26.44 percent of respondents. Following were "Economy" at 19.23 percent, then "Cultural" at 15.87 percent. "Population" and "Housing" were the least cited categories at 0.96 percent each.

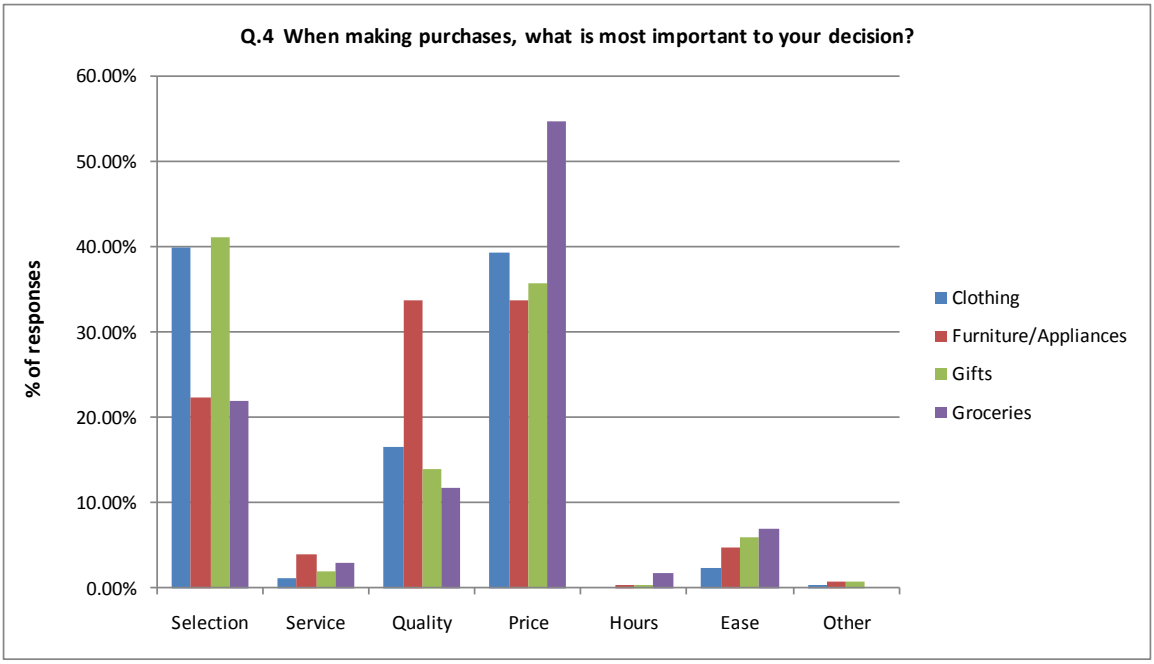


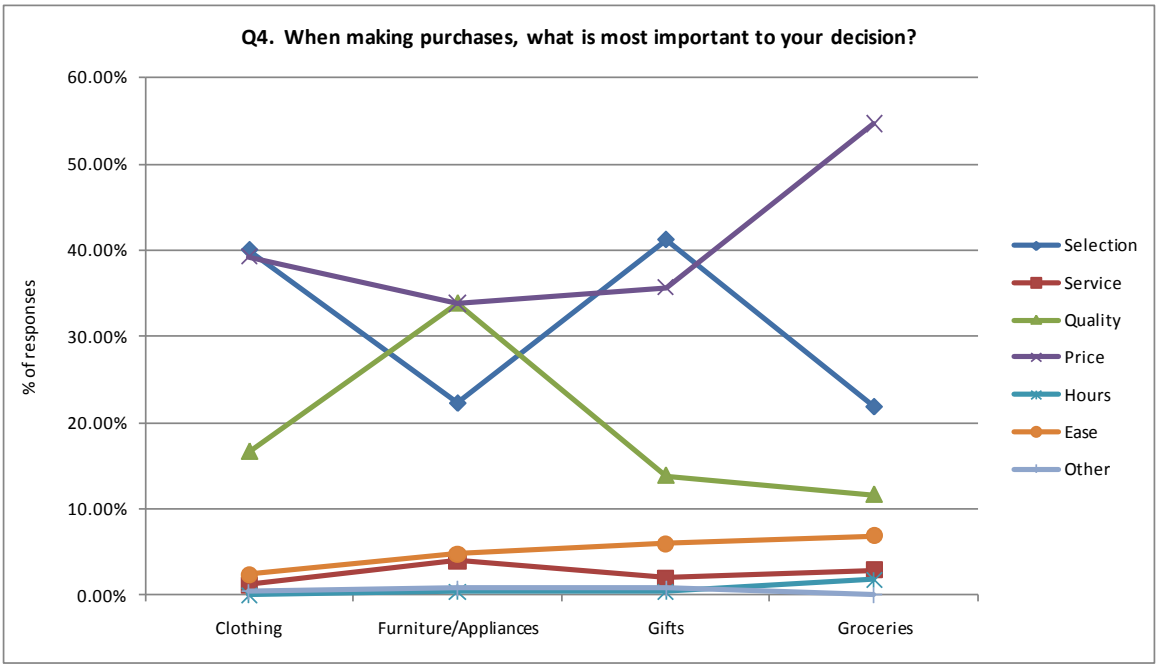
General Shopping Patterns: Where and Why

<u>When making purchases, what is most important to your decision? (Q4)</u>

Participants were asked to choose only one of seven reasons (e.g. service, quality) for influencing each of four types of good purchases. Responses were excluded for respondents selecting more than two purchase reasons for a single good. Two hundred and seventy-four respondents addressed at least one of the good categories ("Groceries") – a response rate of 89.8 percent.

"Price" was reported to be the most important factor across most good purchases with the exception of "Gifts'. However, "Price" was only selected 5.6 percent less often than "Selection" even for the "Gift" purchases. "Price" had the strongest influence on "Groceries" (53.5 percent), as it outpaced the next most important factor, "Selection", by 32.84 percent – the largest gap between the first and second selected purchase factors. "Other" reasons given by at least two respondents included "made in America", "buy local", and "buy online".





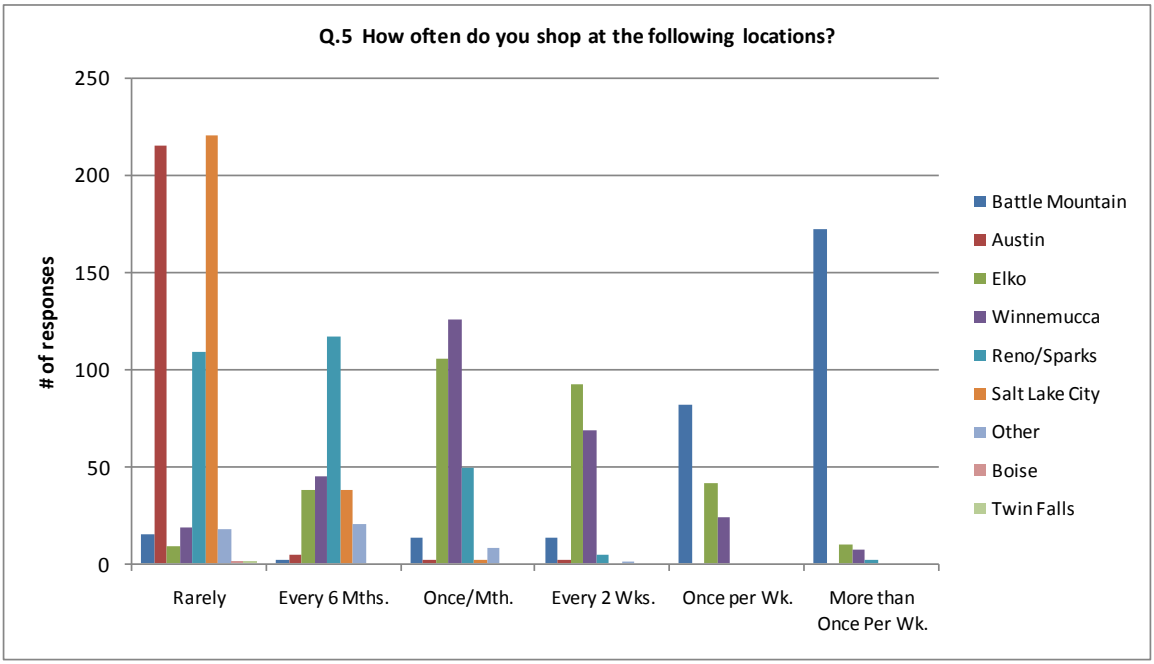
<u>Indicate how often you shop at the following locations. (Q5)</u>

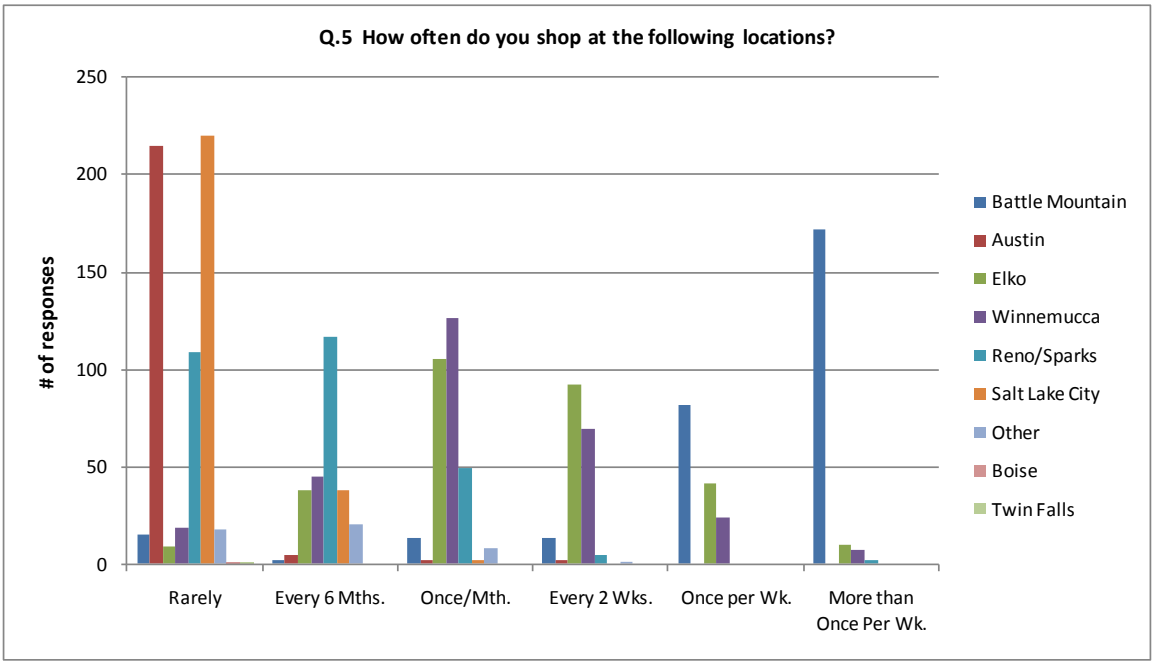
Participants were asked to choose only one shopping frequency for each of seven locations.

Ninety percent of those shopping more than once per week were shopping in Battle Mountain, which dominated all other locations given this shopping frequency. Elko was reported as the next most popular location for the same frequency at 5.24

percent. It should be noted that Elko was reported by 286 respondents given any frequency while Battle Mountain was only reported by 282 respondents. Austin and Salt Lake City were the least popular shopping destinations.

"Other" shopping locations given by at least two respondents included "Twin Falls, Idaho" (56 percent of "Other" total) and "Boise, Idaho" (22 percent of "Other" total).

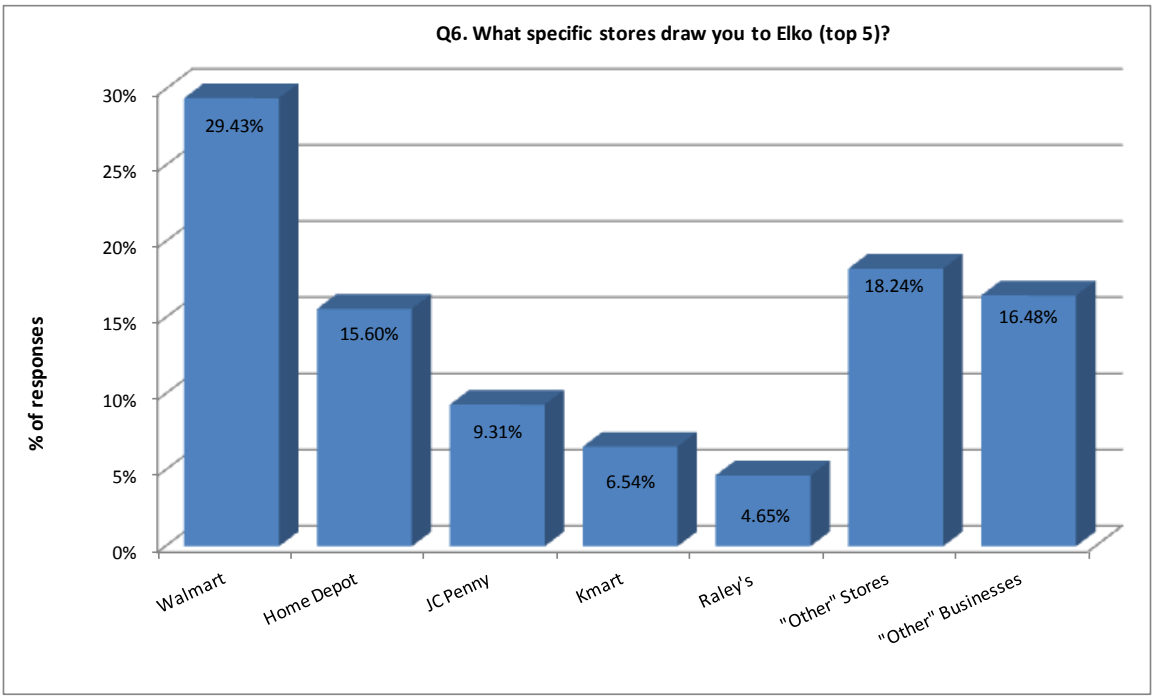


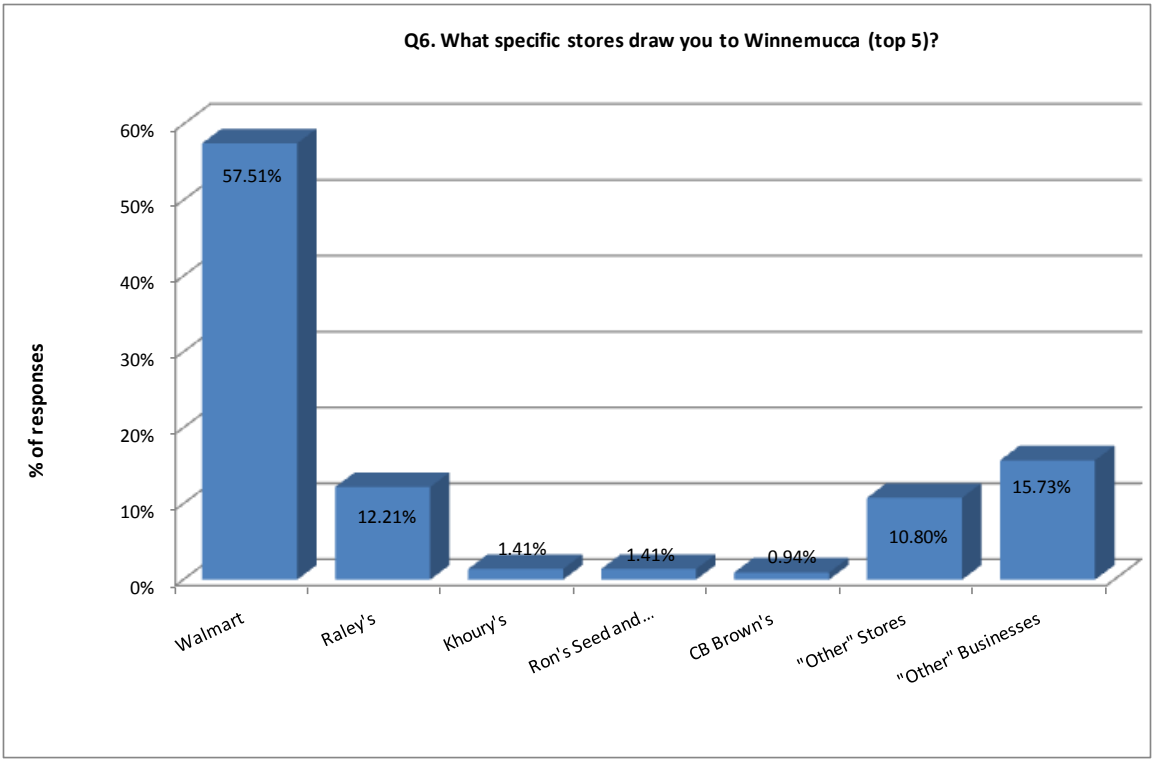


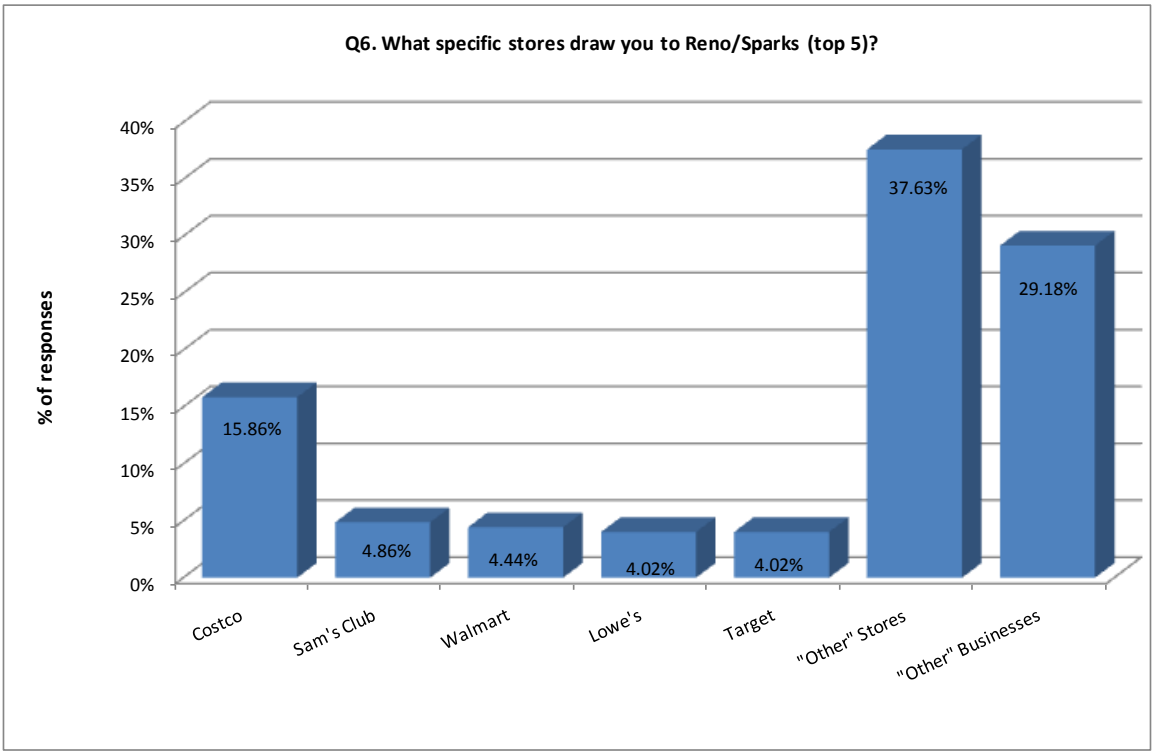
Which specific store(s) draw you to other communities? (Q6)

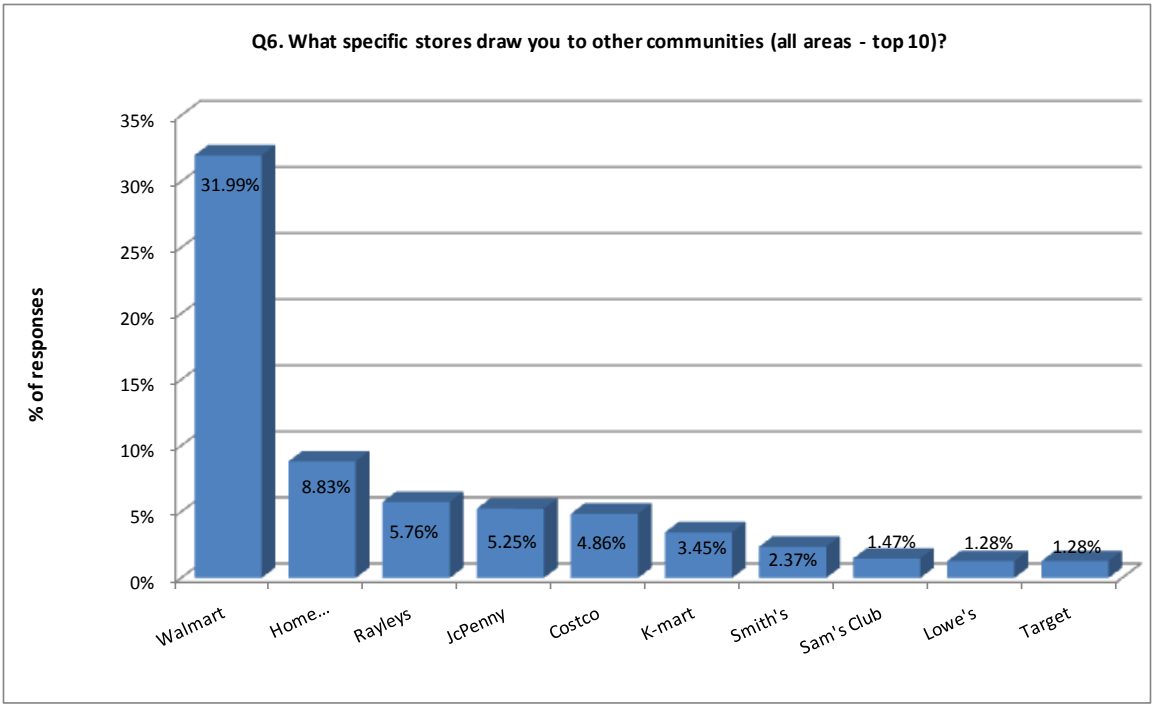
This was an open-ended question. Participants were asked to write in the name of specific businesses that they travel to patronize in Elko, Winnemucca, and/or Reno/Sparks. Elko received the most responses with 285, a 93.44 percent response rate. The response rates for Winnemucca and Reno/Sparks were 87.87 percent and 67.87 percent respectively.

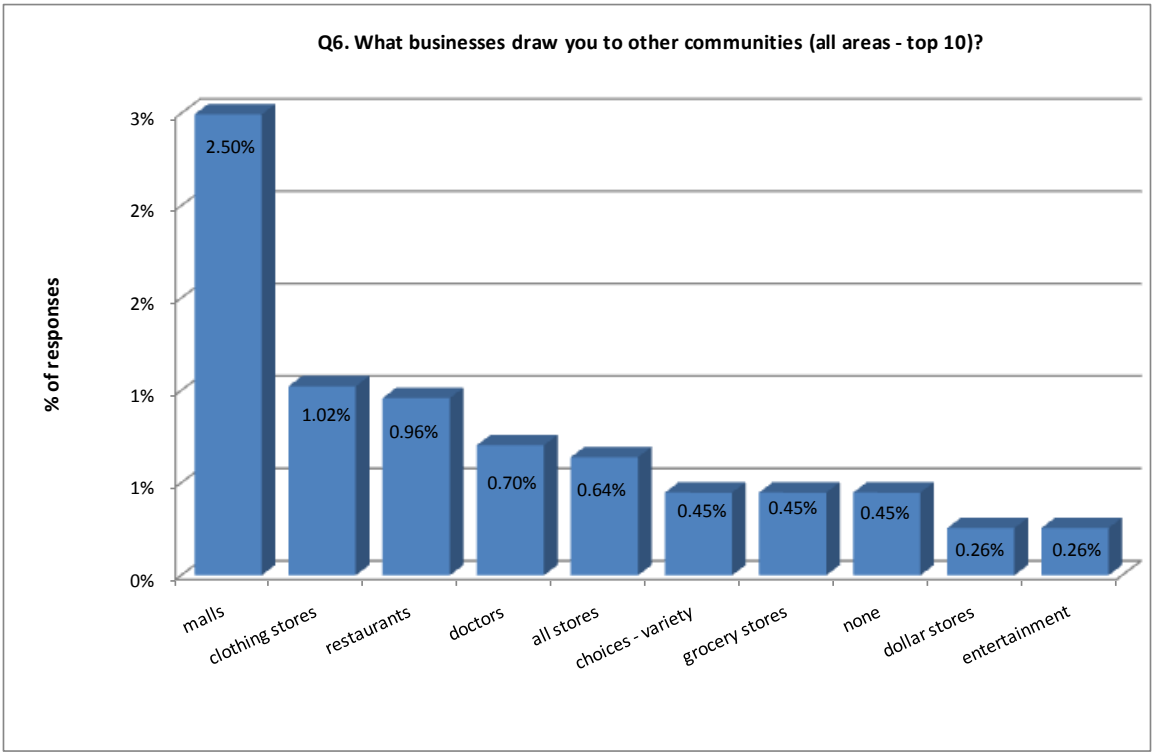
Respondents wrote in the greatest number of Elko stores and businesses – 795 comprised of 48 specifically named stores and 42 general business types. However, respondents named the most diverse businesses in the Reno/Sparks area with 58 specific stores and 33 general businesses. For both Winnemucca and Elko, Walmart was the primary draw of Battle Mountain customers. Big box stores are a draw for rural customers such as those in Battle Mountain.




Q6. What specific stores draw you to Winnemucca (top 5)?
% of responses
60%
50%
40%
30%
20%
10%
0%
57.51%
12.21%
1.41%
1.41%
0.94%
10.80%
15.73%
Walmart
Raley's
Khoury's
Ron's Seed and...
CB Brown's
"Other" Stores
"Other" Businesses

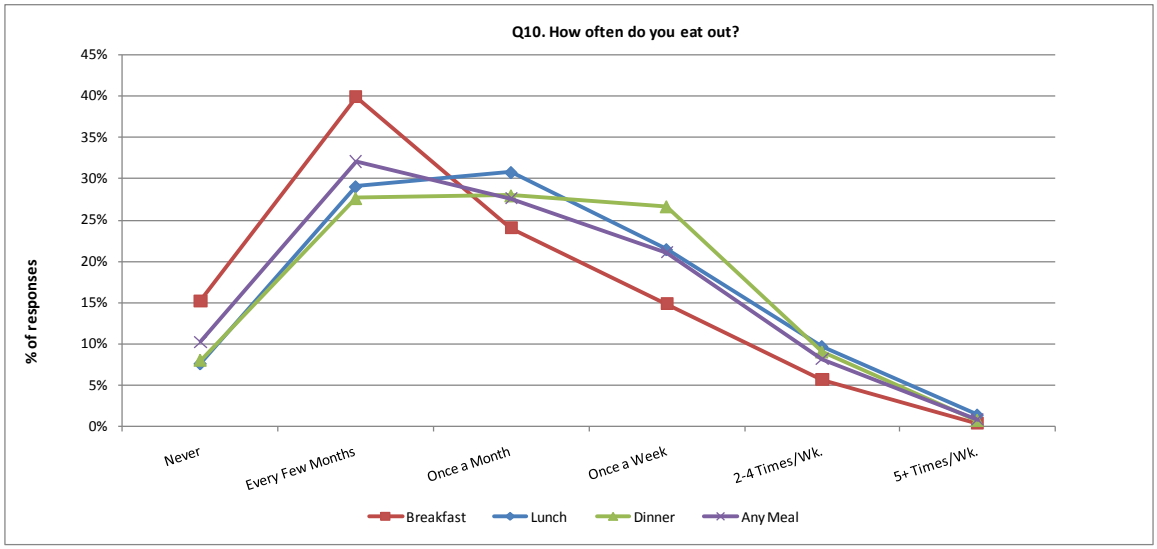

Q6. What specific stores draw you to Reno/Sparks (top 5)?
% of responses
40%
35%
30%
25%
20%
15%
10%
5%
0%
15.86%
4.86%
4.44%
4.02%
4.02%
37.63%
29.18%
Costco
Sam's Club
Walmart
Lowe's
Target
"Other" Stores
"Other" Businesses


Q6. What specific stores draw you to other communities (all areas - top 10)?
% of responses
35%
30%
25%
20%
15%
10%
5%
0%
31.99%
8.83%
5.76%
5.25%
4.86%
3.45%
2.37%
1.47%
1.28%
1.28%
Walmart
Home...
Rayleys
JcPenny
Costco
K-mart
Smith's
Sam's Club
Lowe's
Target


Q6. What businesses draw you to other communities (all areas - top 10)?
% of responses
3%
2%
2%
1%
1%
0%
2.50%
1.02%
0.96%
0.70%
0.64%
0.45%
0.45%
0.45%
0.26%
0.26%
malls
clothing stores
restaurants
doctors
all stores
choices - variety
grocery stores
none
dollar stores
entertainment

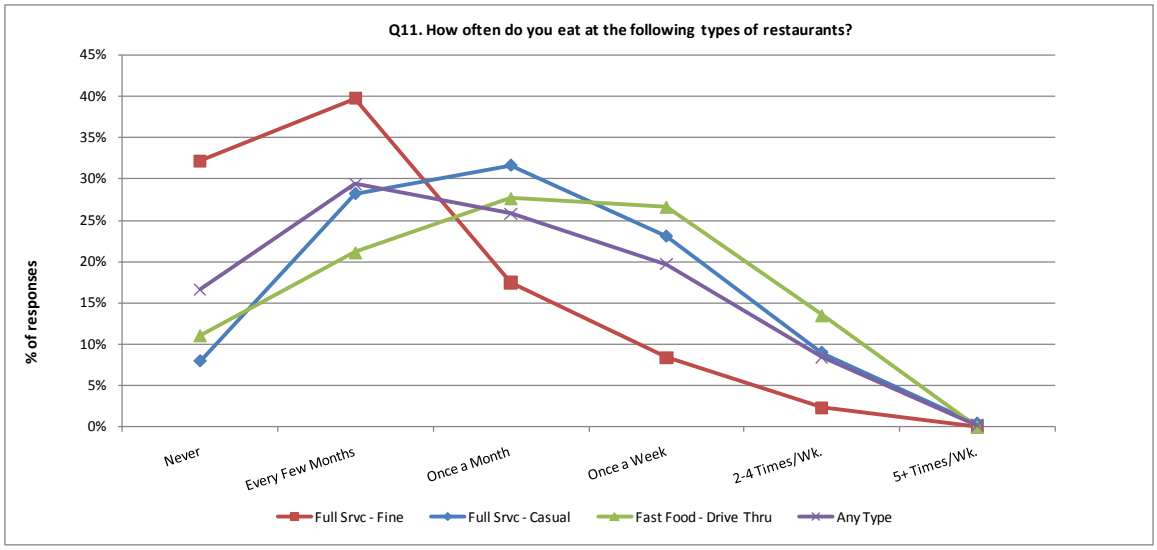
How often do you eat out? (Q10)

Participants were asked to choose only one dining-out frequency for each daily meal – frequencies ranged from "Never" to "5 or more times/week". In general, respondents did not appear to regularly dine out for any meal – 32.11 percent reported eating out "Every Few Months" and 27.64 percent reported eating out "Once a Month". "Dinner" was selected most frequently for dining out at any frequency – 276 respondents chose a frequency other than "Never". Breakfast was selected the least – 240 respondents chose a frequency other than "Never".



How often do you eat at the following types of restaurants? (Q11)

Participants were asked to choose only one frequency for each restaurant type – "Full Service-Fine Dining", "Full Service-Casual Dining", and "Fast Food/Drive Through". In general, respondents did not dine out regularly for any meal – 32.11 percent reported eating out "Every Few Months" and 27.64 percent reported eating out "Once a Month". "Full Service-Casual" and "Fast Food/Drive Through" were selected most often at any frequency – 268 and 257 respectively. "Full Service-Fine Dining" was selected far less with 179 reporting frequencies other than "Never".



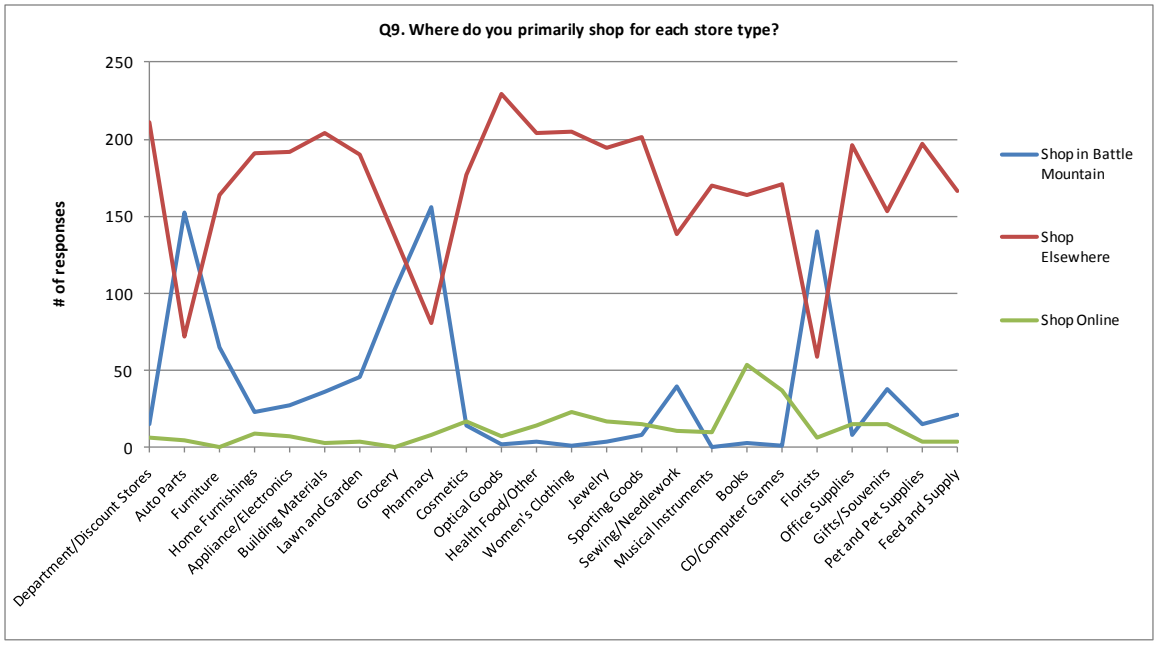
Preferences of Shopping Location Across Types of Goods

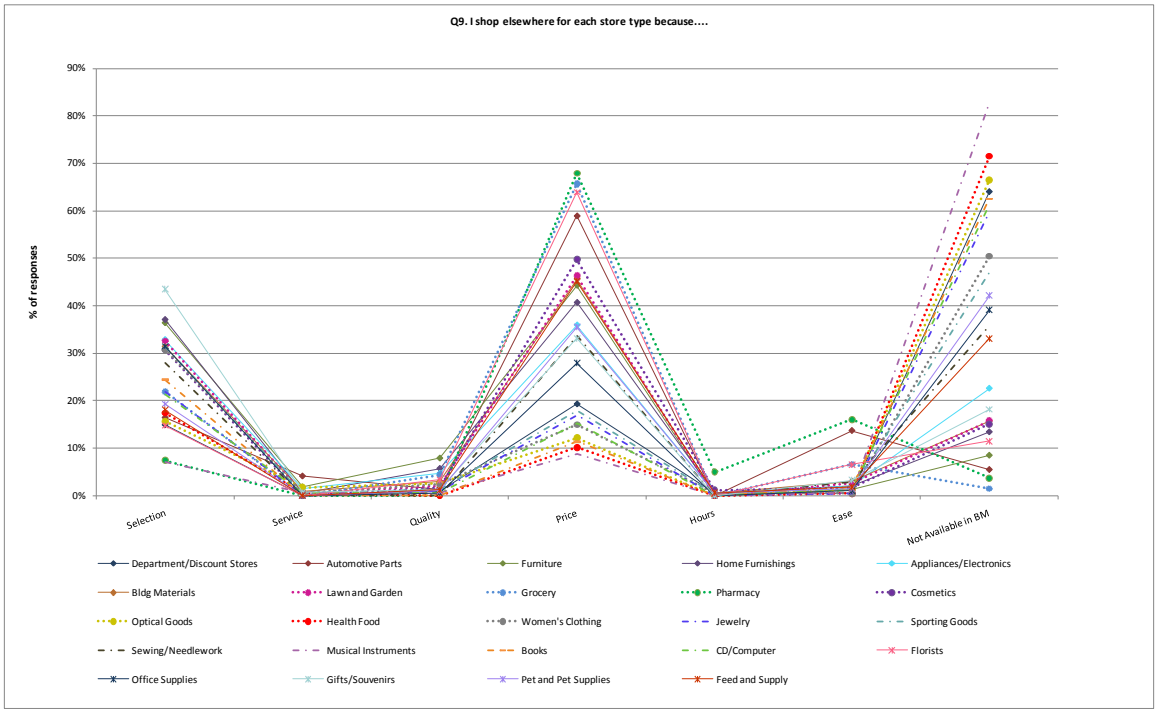
<u>If you shop the following types of stores, please indicate if you primarily shop in the Battle Mountain area. If not, indicate why you shop elsewhere? (Q9)</u>

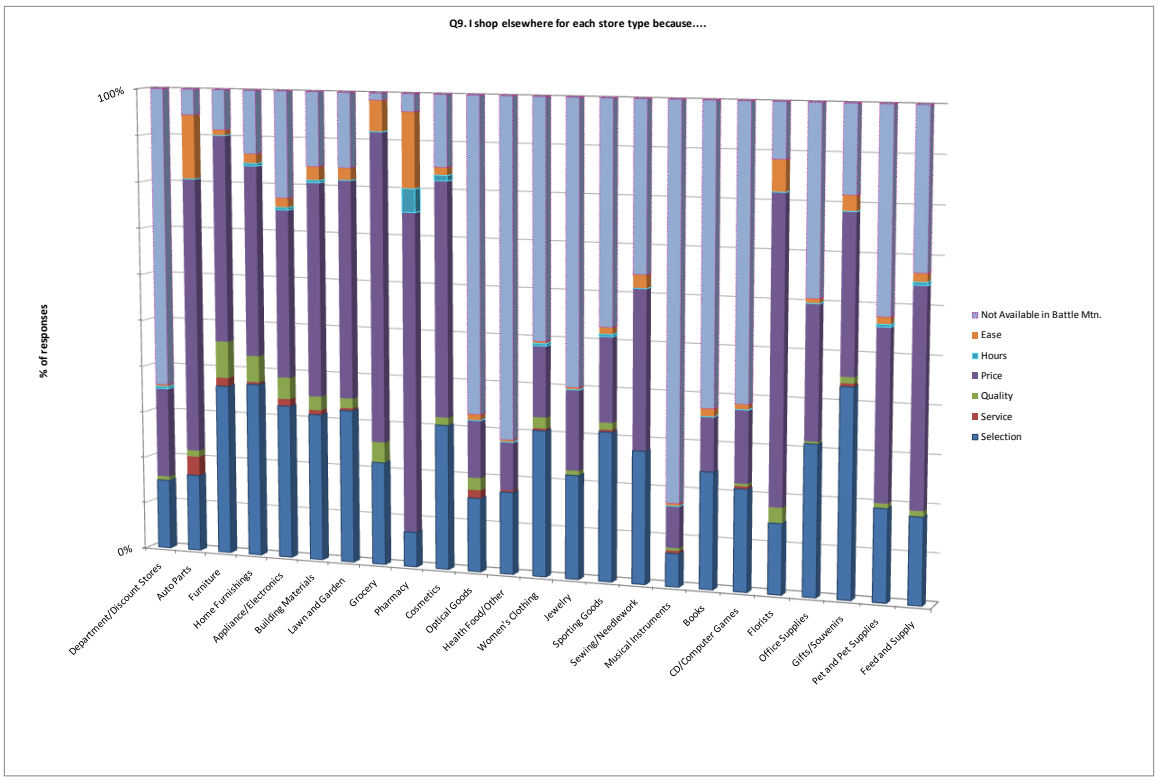
This was a three part question. Participants were first asked to select whether or not they shopped in Battle Mountain at 24 specific business types. Next, if they did not shop at a specific type of business in Battle Mountain, they were asked to choose only one of seven reasons (e.g. service, quality) explaining why they shopped elsewhere. Responses were excluded if respondents selected both shopping in Battle Mountain and a reason they shopped elsewhere. "Automotive Parts" had the greatest number of exclusions (26 percent) for the first two sections. "Department/Discount Stores" had the highest response rate for the first two sections at 80 percent. The average response rate for these combined sections was 70.06 percent

Finally, participants were asked to state whether or not they shopped online. Unselected time blocks were assumed to be "No" responses, resulting in an overall response rate of 100 percent.

Only "Auto Parts", "Pharmacy", and "Florists" were Battle Mountain businesses preferred over out-of-town businesses (35.68 percent, 31.65 percent, and 40.78 percent respectively). "Selection", "Price", and "Not Available in Battle Mountain" were the primary reasons for purchasing goods outside of Battle Mountain. "Quality", "Service", and "Hours" had very little influence over shopping location for any store types. Of these three low-utility qualities, 8 percent of respondents reported that they shopped outside of Battle Mountain to purchase "Quality" "Furniture".


Q9. Where do you primarily shop for each store type?
# of responses
250
200
150
100
50
0
Department/Discount Stores
Auto Parts
Furniture
Home Furnishings
Appliance/Electronics
Building Materials
Lawn and Garden
Grocery
Pharmacy
Cosmetics
Optical Goods
Health Food/Other
Women's Clothing
Jewelry
Sporting Goods
Sewing/Needlework
Musical Instruments
Books
CD/Computer Games
Florists
Office Supplies
Gifts/Souvenirs
Pet and Pet Supplies
Feed and Supply
Shop in Battle Mountain
Shop Elsewhere
Shop Online


Q9. I shop elsewhere for each store type because....
% of responses
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Selection
Service
Quality
Price
Hours
Ease
Not Available in BM
Department/Discount Stores
Automotive Parts
Furniture
Home Furnishings
Appliances/Electronics
Bldg Materials
Lawn and Garden
Grocery
Pharmacy
Cosmetics
Optical Goods
Health Food
Women's Clothing
Jewelry
Sporting Goods
Sewing/Needlework
Musical Instruments
Books
CD/Computer
Florists
Office Supplies
Gifts/Souvenirs
Pet and Pet Supplies
Feed and Supply

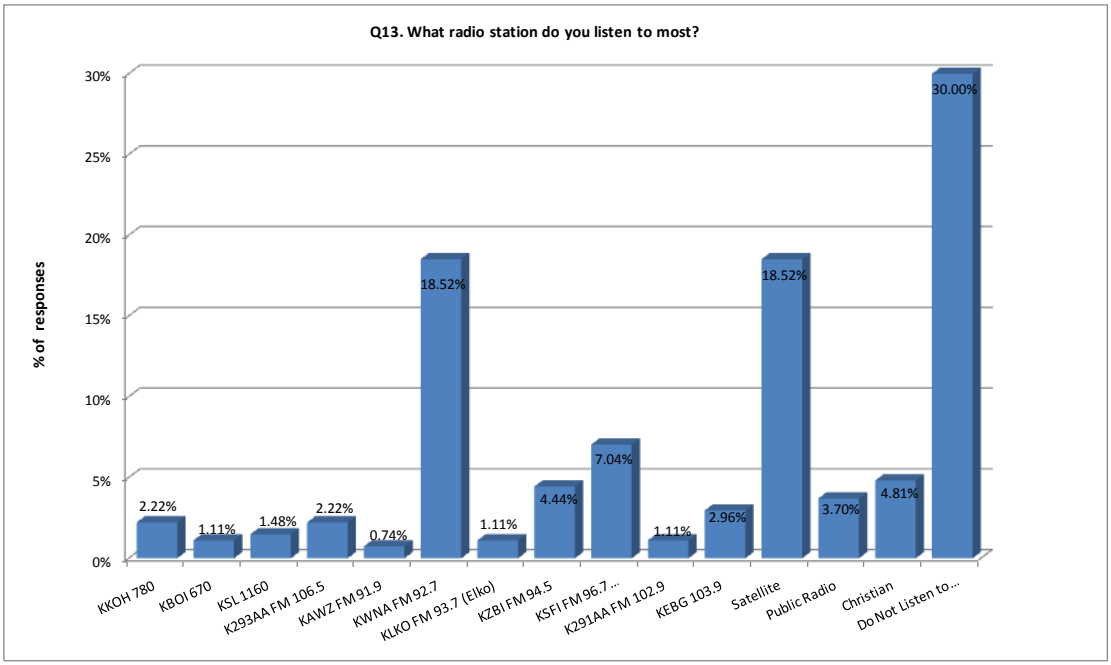


Preference Demographics: Media Outlets, Activities, Community Ideals

<u>What radio station do you listen to most? (Q13)</u>

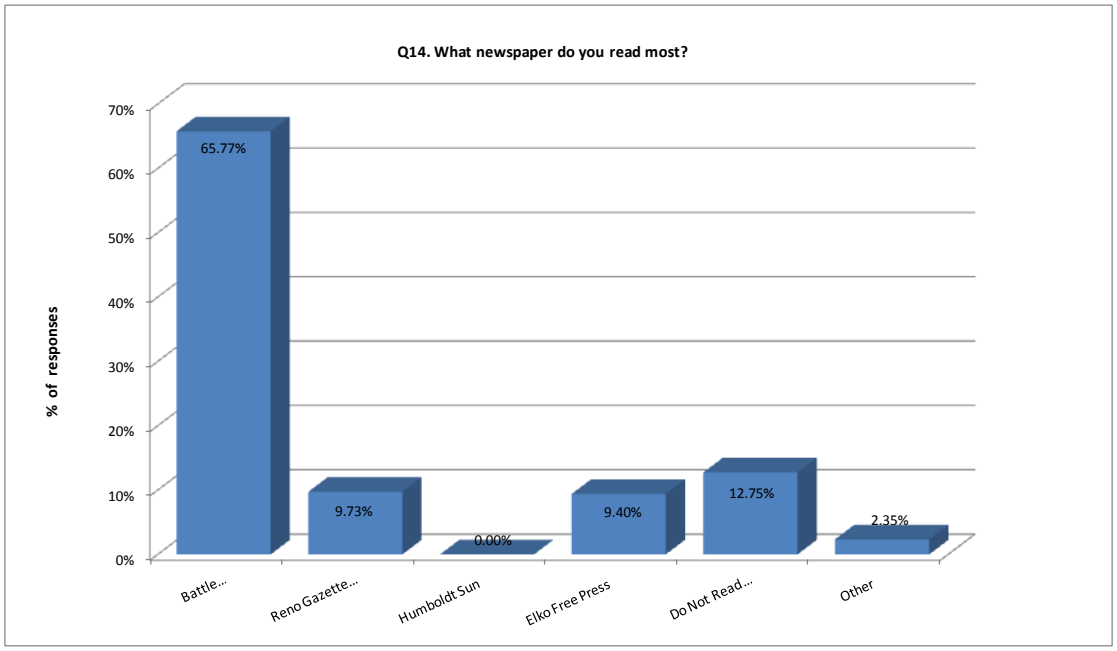
Participants were asked to choose a single radio station they listened to most often. Four radio station call numbers were provided along with a "Do Not Listen to Radio" choice and an "Other" category with an option to write in stations not listed. Nearly half (48.57 percent) of the respondents provided an "Other" response. Responses listed more than once were incorporated into the graph below. Only 10 "Other" responses were not classifiable into one of the categories below and were not duplicated. These 10 are not represented in the chart, so that the percentages are based on n=270.

Thirty percent of respondents reported that they do not listen to the radio – a response rate higher than any of the radio stations. Satellite radio was preferred equally to the most popular local station, KWNA FM 92.7.



What newspaper do you read to most? (Q14)

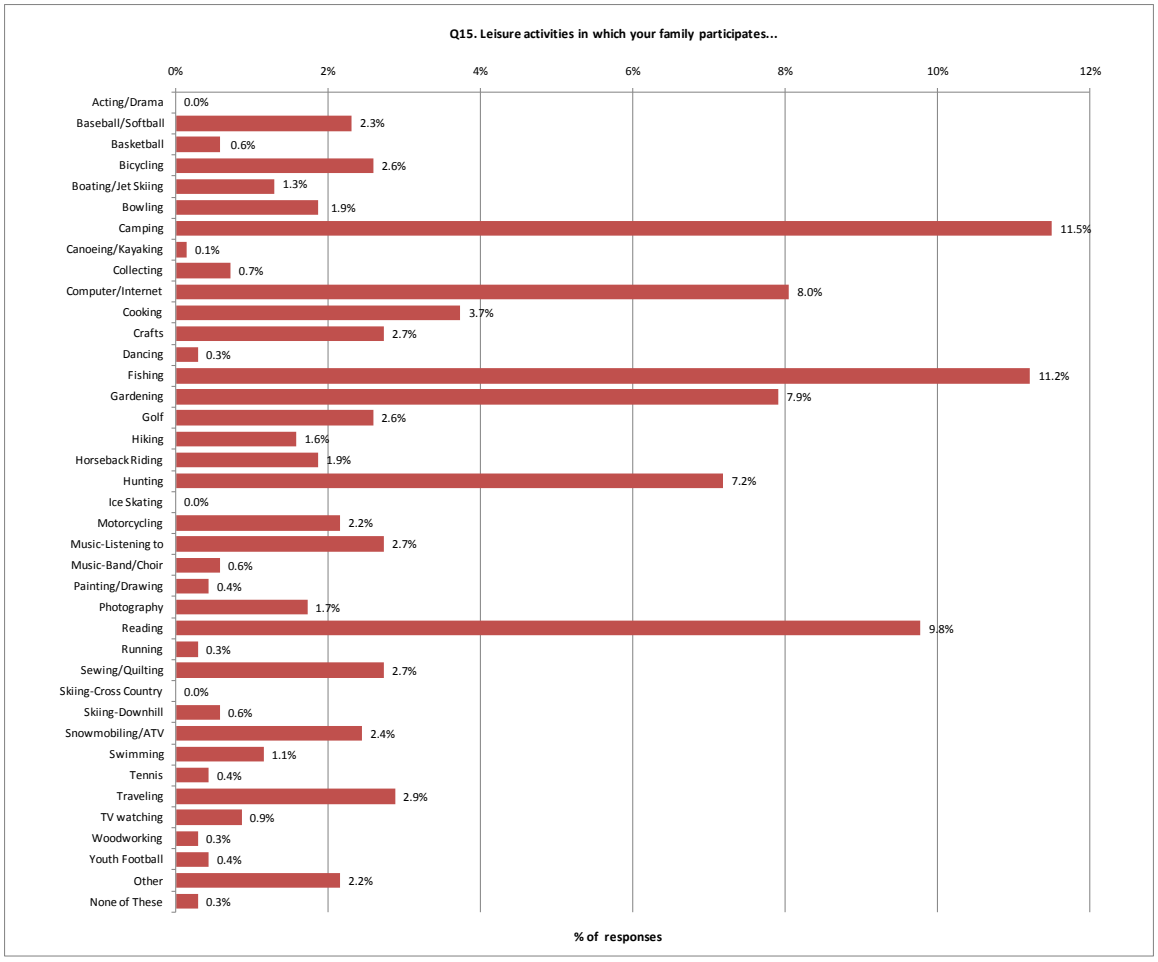
Participants were asked to choose a single newspaper they read most often. Four newspaper names were provided along with a "Do Not Read a Newspaper" choice and an "Other" category with an option to write in newspapers not listed. The *Battle Mountain Bugle* was the overwhelming favorite at 65.77 percent. Unlike the radio question above, only 12.75 percent of respondents reported that they did not read a newspaper.



In which THREE leisure activities does your household participate? (Q15)

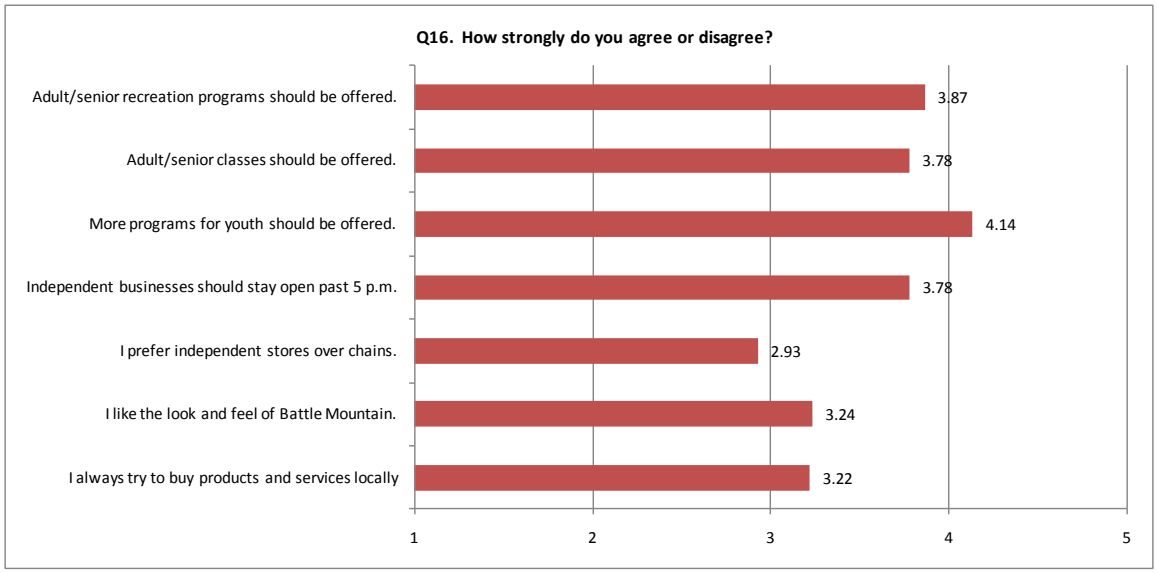
Participants were asked to mark up to three leisure activities. Responses were excluded for respondents selecting more than three activities – 17.07 percent of all original responses were excluded from the analysis below. Two hundred and forty-three respondents selected at least one business type, a 79.67 percent response rate. A total of 696 responses were gathered for this question.

Interest in activities was wide spread, with the most popular category (camping) reported at 11.5 percent. The least popular activities were not selected at all and were "Acting/Drama", "Ice Skating", and "Skiing – Cross Country". "TV Watching" and "Youth Football" were not included in the original survey but are reflected in the graph below because they were written in for the "Other" category by several respondents.



How strongly do you agree/disagree with the following statements? (Q16)

Participants were asked to respond to a series of general statements about the Battle Mountain community and local businesses. They were instructed to select one of five opinions ranging from "Strongly Agree" (data value = 5) to "Strongly Disagree" (data value = 1) for each statement. The figures reflected in the graph represent the average response for that particular statement. On average, respondents slightly disagreed with "I prefer independent stores over chains." In addition, they most strongly agreed with "More programs for youth should be offered."

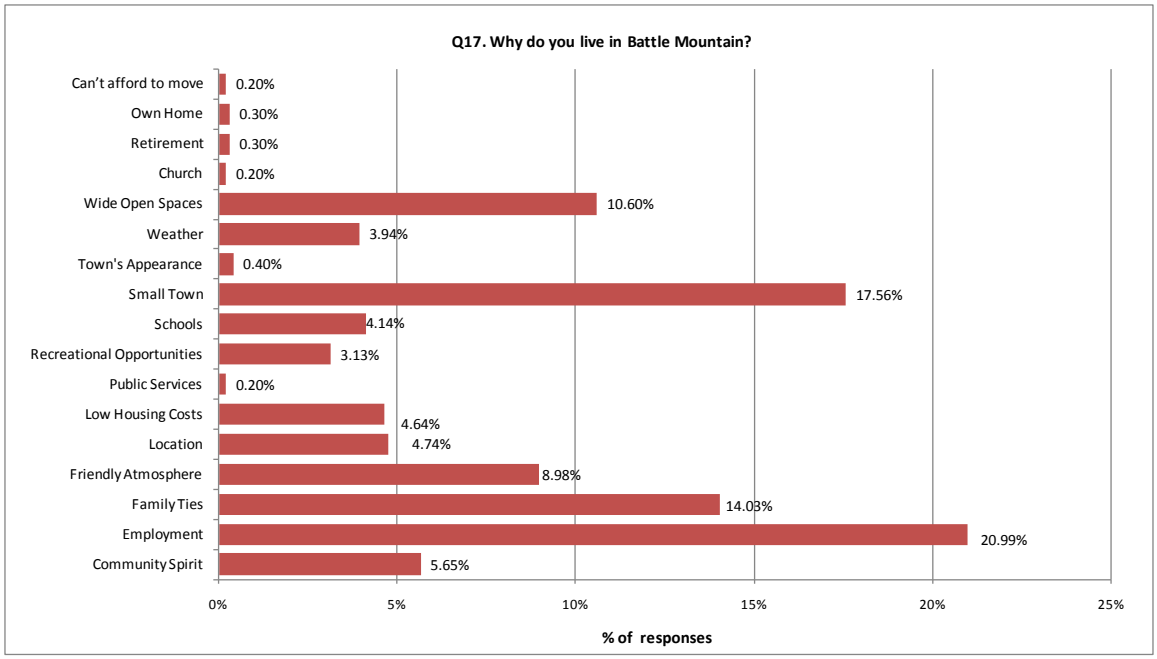


1=Strongly Disagree | 2=Disagree | 3=Neutral | 4=Agree | 5=Strongly Agree

Why do you live in Battle Mountain? (Q17)

Participants were asked to mark all reasons why they live in Battle Mountain. A write-in choice for "Other" was included for reasons not listed in the original survey. Thirty-nine "Other" answers were written in and were incorporated into the graph below. "Church", "Retirement", "Own Home", and "Can't afford to move" are additions based on the "Other" write in reasons.

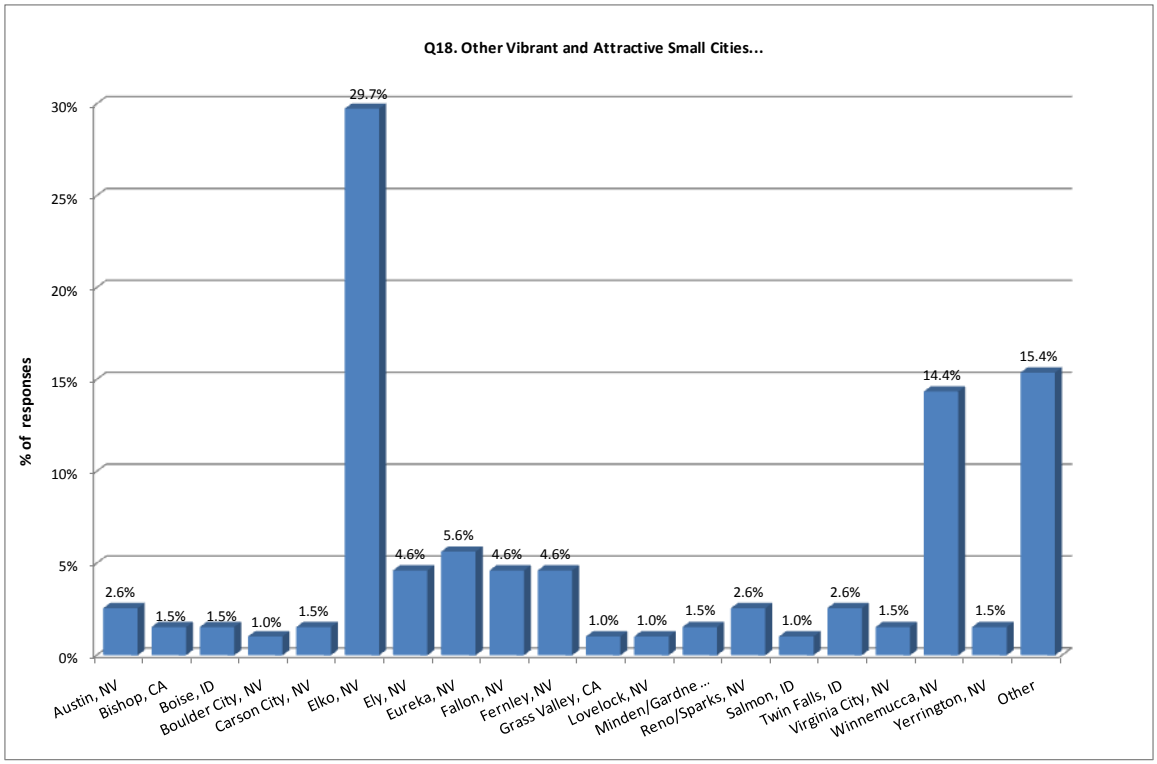
"Employment" was the most commonly selected reason with 20.33 percent followed closely by "Small Town" at 17.01 percent. "Public Services" at 0.20 percent and "Town's Appearance" at 0.40 percent were the least common reasons provided explicitly in the original survey.



Name another small city that you feel has a vibrant and attractive downtown. (Q18)

This was an open-ended question and respondents were asked to write in the name of any other town they felt met the question's criteria. One hundred and ninety-five respondents provided at least one city or town – a response rate of 63.93 percent. The graph below represents locations that were mentioned at least twice. Locations named only once are grouped into "Other".

Elko was stated most often at 29.7 percent, with the second preference being Winnemucca at 14.4 percent. Of particular interest, even though respondents could have written in any city or town in the world, 76.92 percent chose towns or cities in Nevada.



General Demographics: ZIP code, Household Counts, Age, Gender, Education, Profession, Income

Please tell us a little about yourself.

This section asked participants to describe both their personal and household demographics. ZIP code, number of household residents in total, and number of children in household were open-ended questions. All other questions provided checkbox categories from which to choose. Participants were instructed to choose only one category for each checkbox question (where relevant). Response rates and demographic responses are provided with each graph.

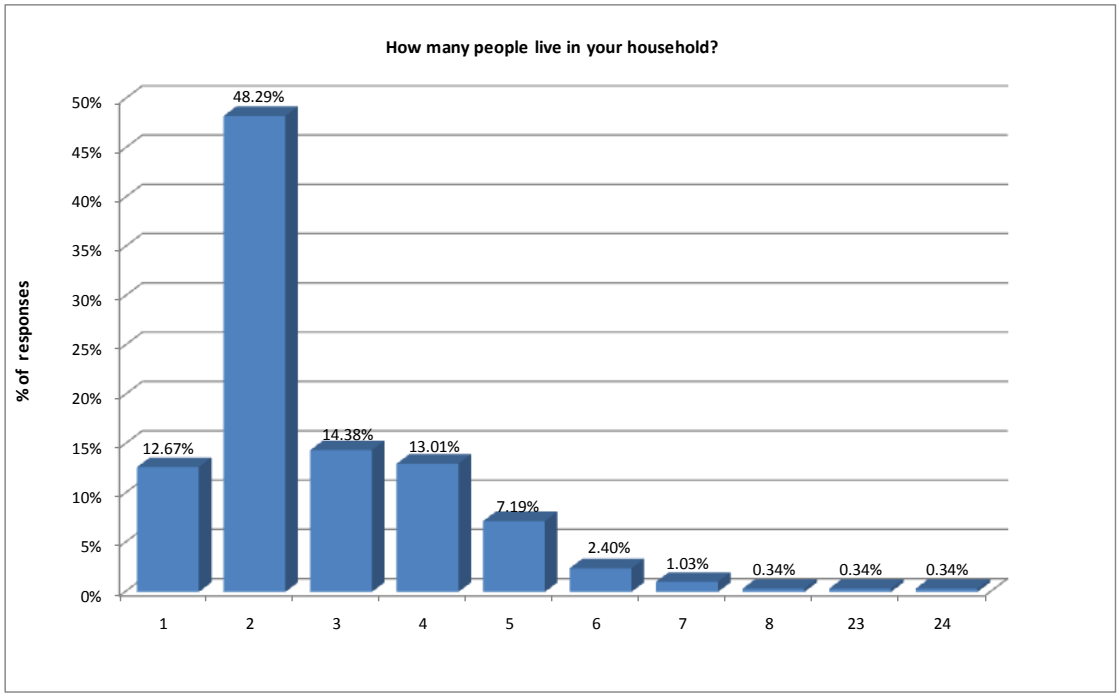
What is your home ZIP code?

Response rate of 97.7 percent.

Zip	Freq.	Percent
89820 - Battle Mountain	295	98.99%
97630 - Lakeview, OR	1	0.34%
89821 - Moapa Valley	1	0.34%
89020 - Amargosa Valley	1	0.34%
Total	298	100.00%

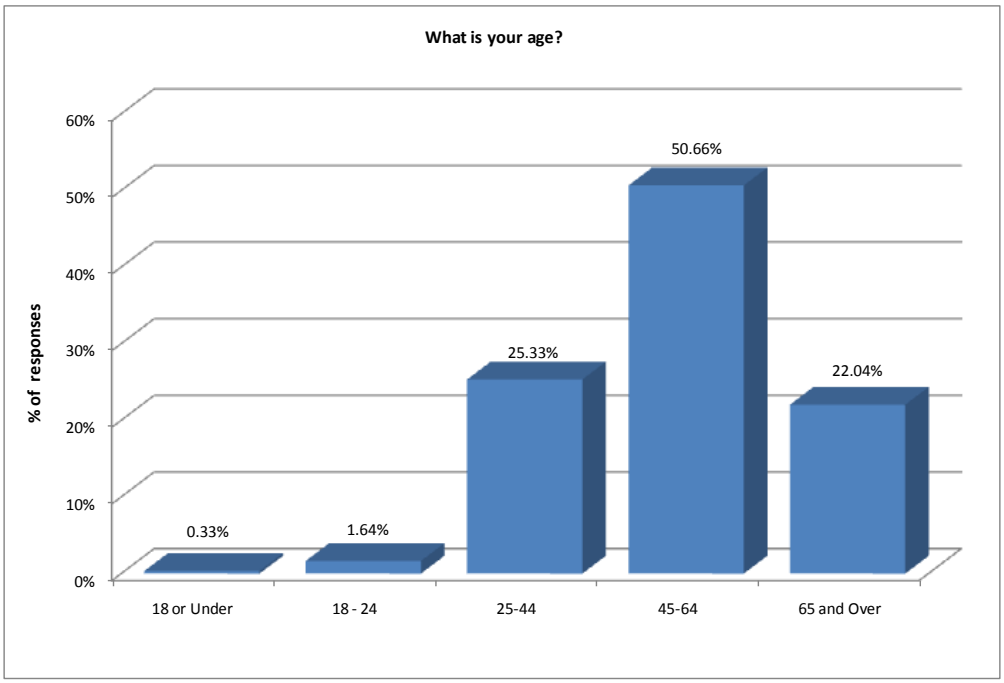
How many live in your household?

Response rate of 95.74 percent. Household counts of 23 and 24 were confirmed against paper survey.



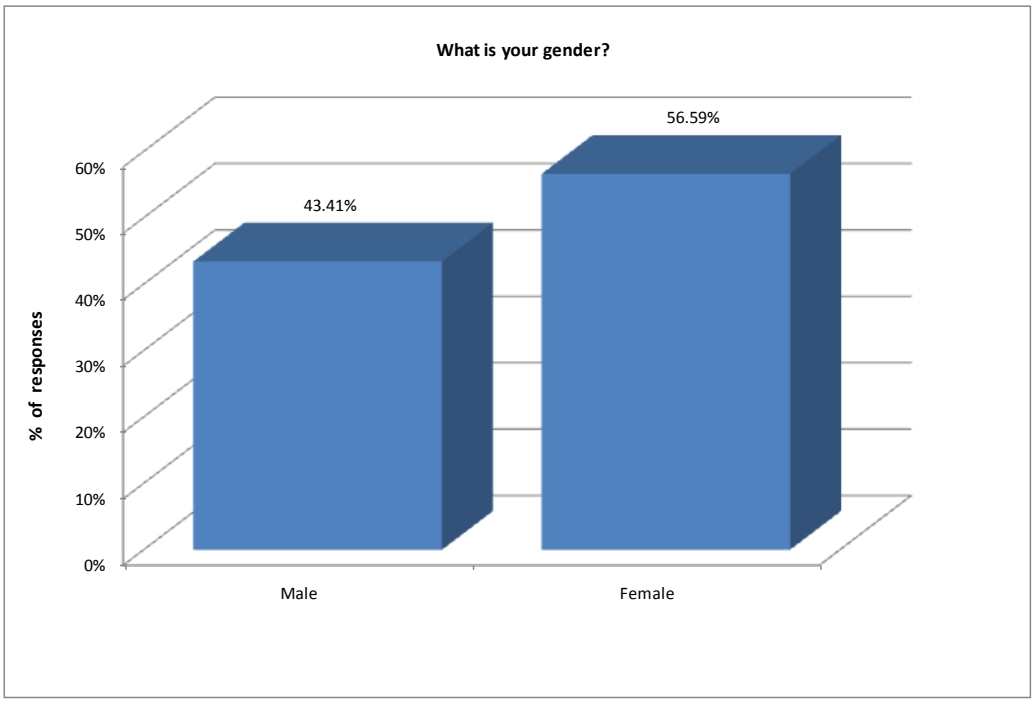
What is your age?

Response rate of 99.67 percent.



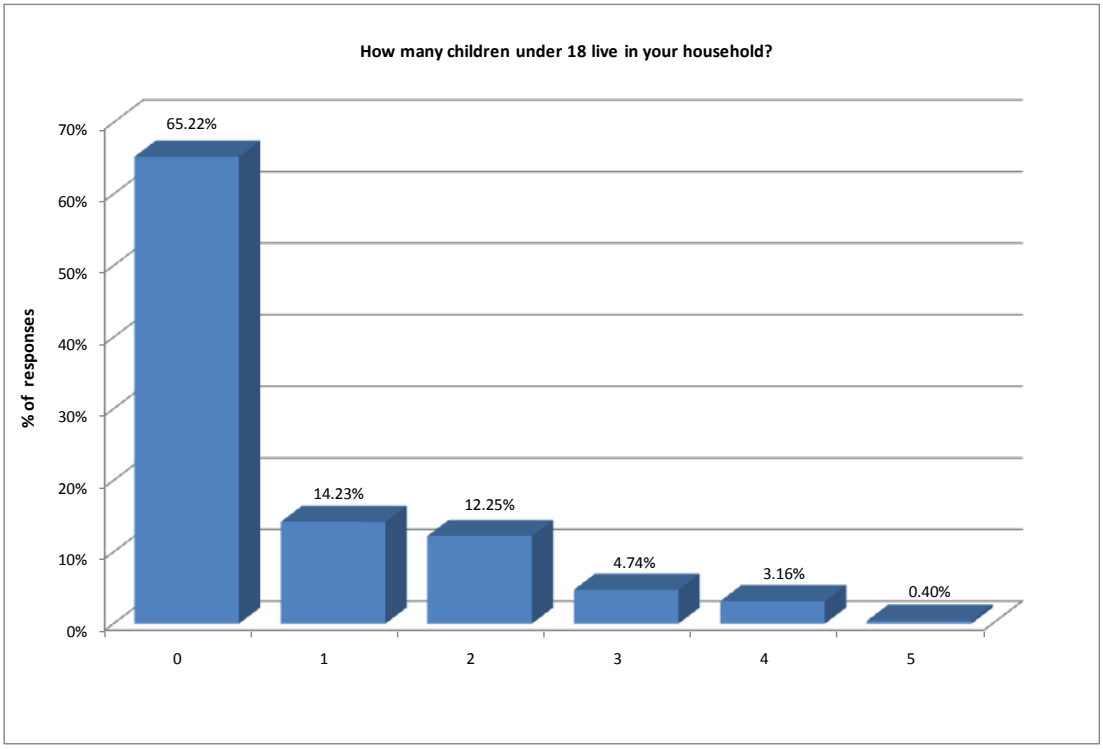
What is your gender?

Response rate of 84.59 percent.



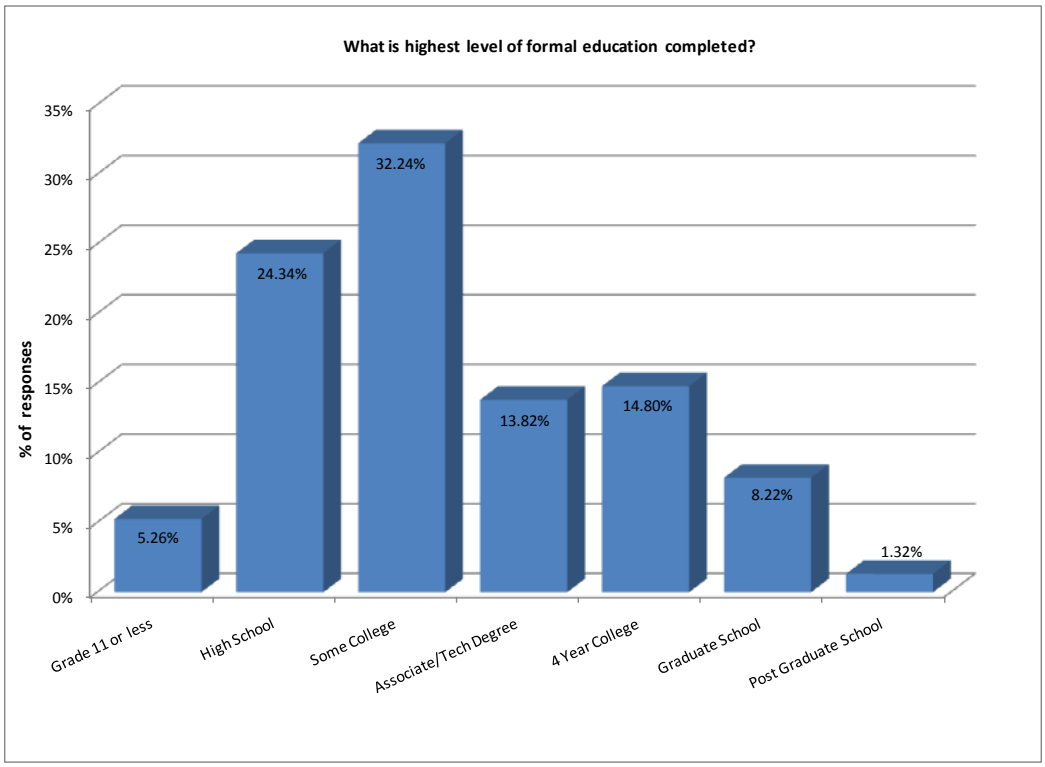
How many children under 18 live in your household?

Response rate of 82.95 percent.



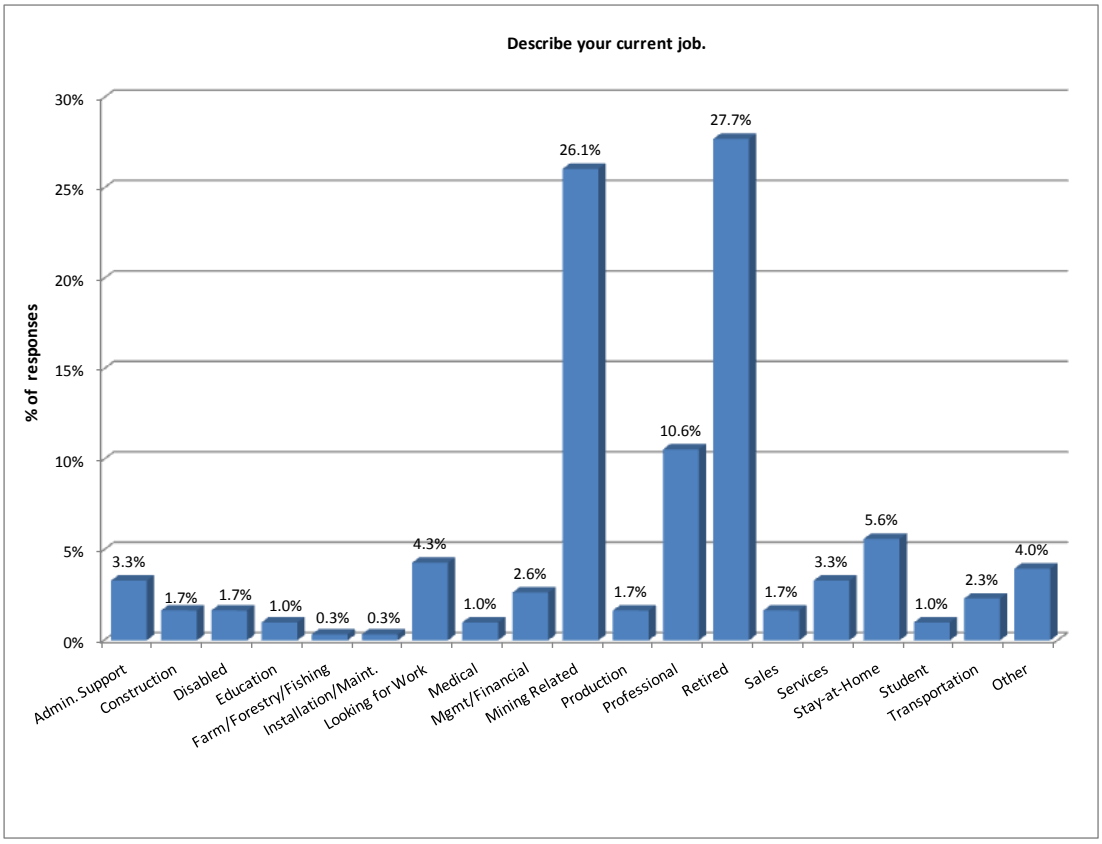
What is the highest level of formal education you have completed?

Response rate of 99.67 percent.



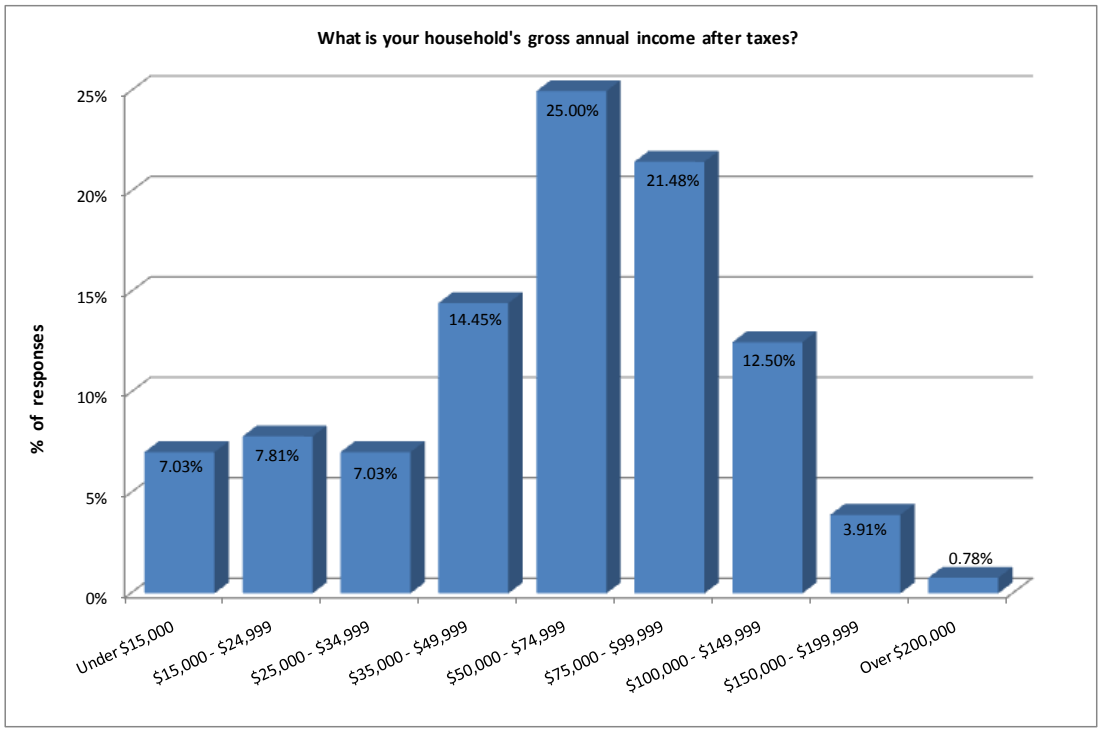
How would you describe your current job?

Response rate of 99.34 percent. This was the only general demographic question that contained an "Other" category in the original survey. There were 38 "Other" answers, 26 of which were incorporated into the existing categories or represented in "Education", "Medical", or "Disabled", these categories were created for three or more written-in responses.



What is your household's gross annual income after taxes?

Response rate of 83.93 percent.



Comments

A final section was included so respondents could record general thoughts or comments. The following is a sampling of some comments of interest.

- Western market owner said we have to raise prices because the dollar store is taking some of our business last time we shopped there. We shop Elko because of selection and prices. Gas here is almost always high.
- The worst thing about BM is the junk and garbage. No one does anything about it.
- If Battle Mountain considered boom/bust why not cater to mine workers? Need: extended bank hrs, and 7 day Pharmacy.
- The swimming pool needs to be bigger and updated so that the kids can have a swim team. There needs to be a non-religious club for kids, e.g. Boys and Girls Club and have teen open and/or work (15+) at a movie theater, etc. Plant trees.
- Lander County had the opportunity to restore the Argenta marsh, which was once a viable wildlife and recreation area. In Battle Mountain local yard sales are a big attraction among the residents.
- I am tired of small town business owners running everything in BM. It costs a fortune to eat and buy anything in town. Won't allow anything new in town. Help!
- Would like to see the bowling alley reopen and the construction of an indoor swimming pool that would be open year.
- Better medical facilities and schools. Do something about the railroad stopping emergency vehicles from going from one side of town to the other. Get rid of old buildings. (paraphrased)
- Battle Mountain could be so much better if those in control would let it. Prices here are way too high, lousy cooks & service. We need more variety and better prices.
- Need to bring in more small-to-medium industrial companies, like warehousing and manufacturing. Need more tourist events, e.g. Pony Express Race. Biggest problem, older families/businesses owners do not want competition or Battle Mountain to grow.
- We have a huge airport runway. Use it to our advantage. Ignore the whiners out in Hill Top regarding noise.
- I wish anyone luck if they ever want to try and establish a business in Battle Mountain. Franchise owner had to jump through hoops to pass all the building codes. I doubt the commissioner-owned businesses have had to do the same.
- The town makes it hard for businesses to come to the town. County should welcome new business to town; also make homeowners clean up (trash and old cars in front of homes).
- A pet supply store would never prosper in Battle Mountain but a 12-20 run boarding kennel with grooming would. Isn't it a shame that banks are anti-small business?

- I buy the bulk of my groceries and gasoline in town. I buy most of my prescriptions in town. I try to support this town but am tired of our elected officials giving all new businesses a hard time.
- Essential businesses have a hard time. Business can't remain without a profit.
- I hope Battle Mountain remains small. No growth is good for me. Keep your social mess in Reno and Vegas.
- I believe BM is a strong community; its appearance has never recovered from the shift of downtown to the newer freeway exit. There are many ugly buildings and such. Slowly but surely it's improving.
- I heard you had a chance at Walmart when I first moved out here 6 years ago and you turned it down. I understand you want to keep the town small but all you've done is force us to shop elsewhere. You don't have the stores that carry what we need.
- Desperately needs daycare/child care, more activities (bowling, movies, arcade) for youth so they stay out of trouble/drugs/sex/drinking & boredom in general (a YMCA/YWCA would be awesome). We also need more activities/opportunities for seniors.
- The biggest problem with Battle Mountain and Lander County is we have no enforcement of building & county codes.
- We price in town and buy, but prices are sometimes better at other stores. We had a chance for other stores, but city fathers do not want them in.
- Auto parts are too expensive, as are groceries. Entertainment is limited to gambling & drinking or racing. A theater, bowling alley/arcade would be great. We need events again-we've lost the Pony Express, Bluegrass Festival & Armpit events.
- I would like to help.
- We need more jobs: warehousing, have a lot of space for it.

Conclusions

- Fifty-one percent of respondents were between the ages of 45 and 64. The number of people residing in the average respondent's household was 2.8. Fifty-seven percent were female. Sixty-five percent had no children living at home. Twenty-six percent worked in the mining industry and 28 percent were retired. A household income of $50,000 to $75,000 was reported by 25 percent of the respondents.
- Very little frequent shopping occurs in Battle Mountain. Approximately 83 percent of all Battle Mountain business types were reportedly patronized once per week or less. Only "Grocery Shopping" was reported at a frequency greater than once per week.
- "Auto Parts", "Pharmacy", and "Florists" were the only goods reported to be purchased primarily in Battle Mountain. Even "Groceries" were reported to be purchased primarily outside of Battle Mountain. Though "Groceries" were reported to be purchased more than once a week in a prior question, this may be last minute items rather than the majority of grocery purchase.

- Elko, Winnemucca, and Reno/Sparks shopping areas were reported to provide the greatest competition to the Battle Mountain retail sector. In fact for all shopping frequencies, Elko even out-competed Battle Mountain 286 to 282.
- The desire for a Walmart in Battle Mountain was a re-occurring theme. Approximately 29 percent of respondents listed it as the business they would most like to see open in Battle Mountain. Approximately 32 percent of respondents stated that Walmart is the biggest shopping draw in other communities.
- Respondents listed "increased business mix" and "lower prices" as improvements that could most help the business sector. Prices and availability were also reported as the most important factor when making purchasing decisions, especially for "Groceries".
- Battle Mountain residents eat out infrequently, on average once-a-month or less regardless of the type of restaurant or daily meal. However, dinner and more casual dining are preferred over other meals and fine dining. The specific restaurant types most desired in Battle Mountain are Chinese/Japanese and a bakery.
- Respondents would like to see more senior and youth activities and services offered. They do not have a preference for independent stores over chains.
- Approximately 77 percent of respondents listed other Nevada towns as small cities with attractive downtown areas. Elko and Winnemucca were the most frequently listed attractive small cities.

SECTION IV

MARKET SEGMENTATION FOR DOWNTOWN BATTLE MOUNTAIN

SECTION IV

MARKET SEGMENTATION FOR DOWNTOWN BATTLE MOUNTAIN

The trade area for Battle Mountain businesses is the area where most customers who patronize Battle Mountain businesses live. The most accurate way to find and define trade areas is to use actual customer data obtained by businesses on customer addresses, ZIP codes and amount of purchase. This method is known as "customer spotting".[1] Different businesses may have very different trade areas, however, and the customer spotting method requires a lot of data collection. Another method for defining trade areas is using average driving times. This method uses existing data and results can be found quickly. Average drive times combined with ZIP code areas are used in this report to define Battle Mountain trade areas. Since some of the ZIP code areas are large, actual drive times vary within the ZIP code areas. Three trade areas have been defined: the primary trade area consists of the population within ZIP code areas that are a 0 to 15 minute drive from downtown Battle Mountain, the secondary trade region includes the population within ZIP code regions that are a 15 to 30 minute drive time and the tertiary trade region is the population within ZIP code regions that are a 30 to 60 minute drive time. The ZIP codes included in each type of trade area are as follows:

Battle Mountain Primary Area consists of ZIP codes (see Figure 1):

- 89820 (Battle Mountain)

Battle Mountain Secondary Area consists of ZIP codes (see Figure 2):

- 89820 (Battle Mountain)
- 89414 (Golconda portion of Valmy/Golconda)

Battle Mountain Tertiary Area consists of ZIP codes (see Figure 3):

- 89820 (Battle Mountain)
- 89414 (Golconda portion of Valmy/Golconda)
- 89445 (Winnemucca/Grass Valley)
- 89821 (Crescent Valley)
- 89822 (Carlin)

Battle Mountain Primary Trade Area, as defined above, was home to nearly 4,916 people living in close to 1,738 households in 2010. The Secondary Trade Area contained an estimated 5,412 people in 1,925 households, while the Tertiary Trade Area contained an estimated 25,177 people in 8,865 households. The people living within

[1] This section follows the organization found in Program on Applied Demographics, Cornell University, (2004). *Downtown Auburn Business Improvement District*. Ithaca, NY: Cornell University.

the Tertiary Trade Area make up the majority of customers for most businesses in Battle Mountain. In order to learn more about this customer base, ESRI Tapestry Segmentation Profile data is examined.

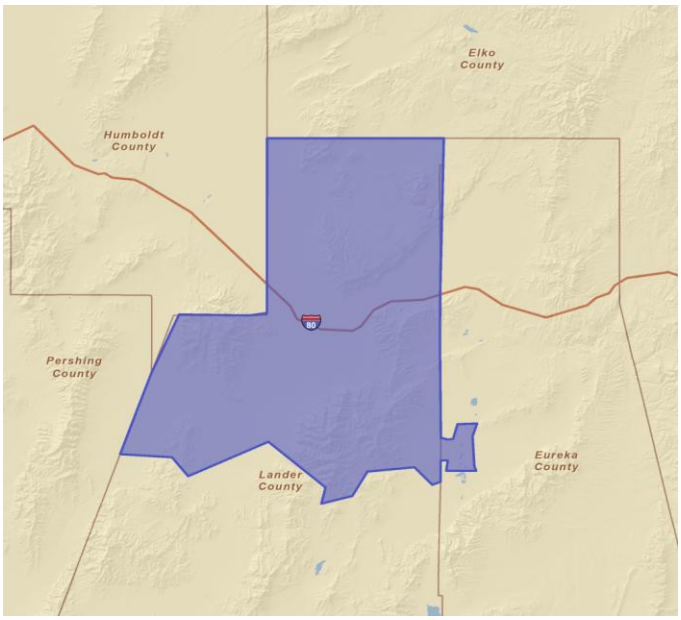


Figure 1. Battle Mountain Primary Area (0 to 15 minute drive).

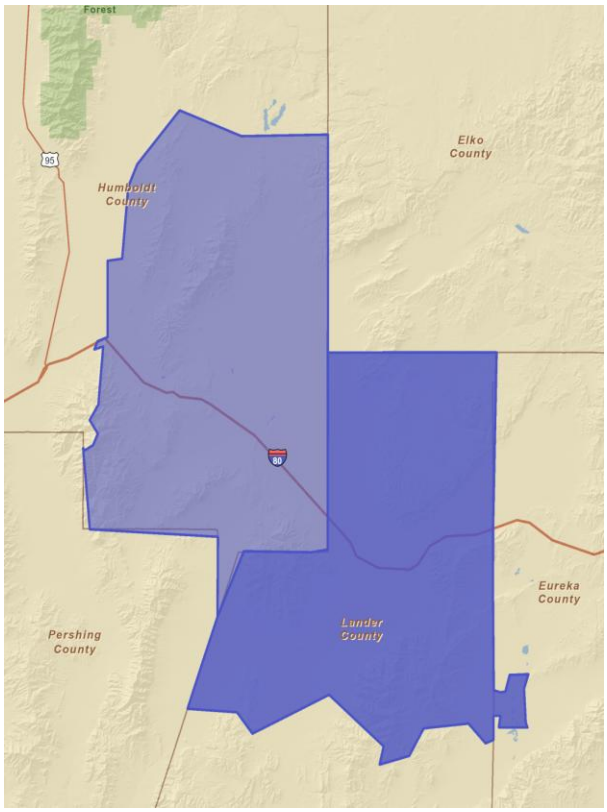


Figure 2. Battle Mountain Secondary Area (15 to 30 minute drive).

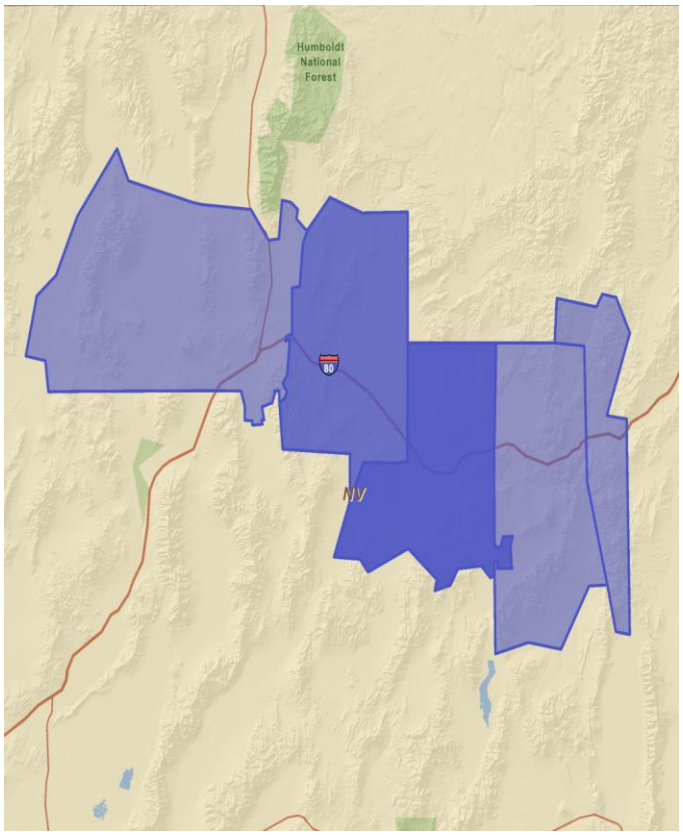


Figure 3. Battle Mountain Tertiary Area (30 to 60 minute drive).

Classification of Neighborhoods Using Tapestry Segmentation Profiles for Battle Mountain Trade Areas

ESRI Business Analyst On-line has developed profiles for neighborhoods by using U.S. Census and other data. Using detailed Census data on sex, age, education, income, occupation, household composition, housing characteristics, and so forth, in combination with other private and public data sources, ESRI models divide cities into neighborhood types thought to best represent the types of families choosing to live there. ESRI uses 65 detailed profiles for neighborhood type, each of which is a member of 12 "Life Mode Summary Groups" with similar socio-economic status and age cohorts. Of course, the categories will not exactly describe each household in a neighborhood but market specialists have found the profiles useful in understanding the general nature of the customers in a particular neighborhood. A summary of the ESRI profiles for those most commonly found in the Battle Mountain Trade Areas is below. The detailed distribution can be found in Appendix C along with ESRI's full description of each of the tapestry segments.

Battle Mountain Primary Trade Area

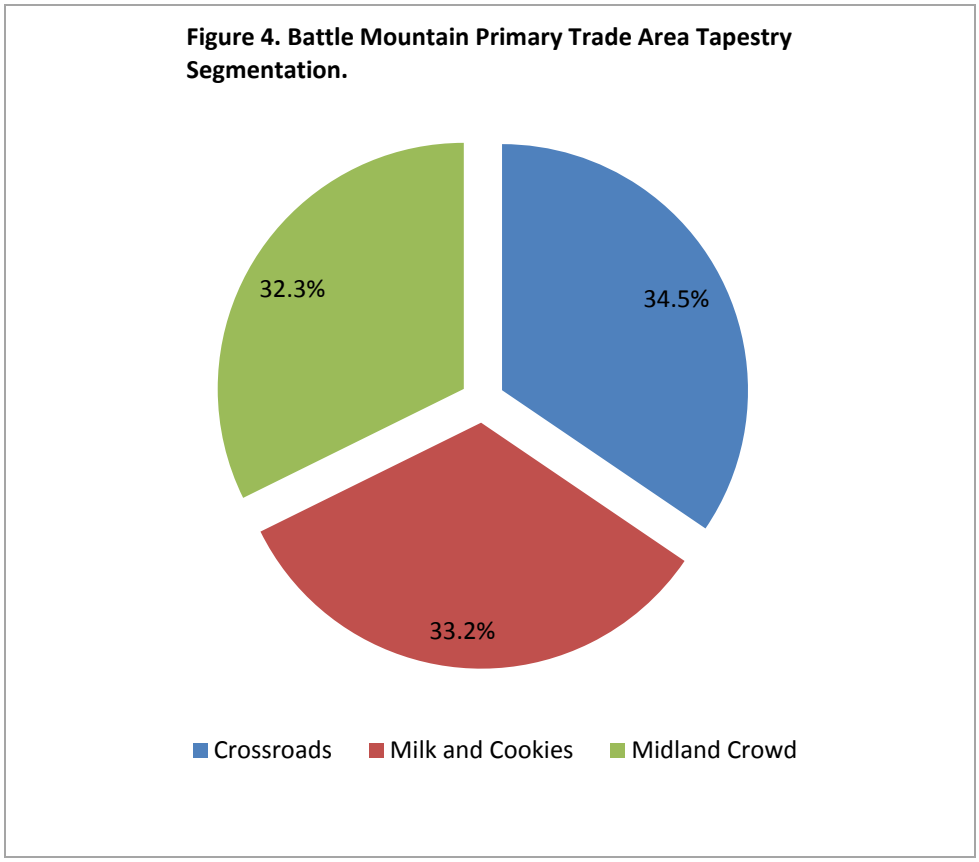
The estimated 4,916 households within the primary trade area for Battle Mountain fall into two Life Mode Groups: Family Portrait (35.8 percent) and American Quilt (64.2 percent). These are defined as follows:

***Family Portrait*:** Ethnically diverse fast growing population.

***American Quilt*:** Households in small towns and rural areas.

Within each of these two Life Mode Groups, Battle Mountain Primary Trade Area neighborhoods are further classified as belonging to one of the 65 detailed sub-groupings. Figure 4 summarizes the make-up of the Battle Mountain Primary Trade Area according to these sub-groupings. The "American Quilt" group has been categorized into two sub groupings, "Crossroads" and "Midland Crowd". The "Crossroads" segment makes up the larger portion (38.2 percent) for Battle Mountain Primary Trade Area. An abridged ESRI description of this sub grouping follows; for a full description see Appendix C.

> ***Crossroads*:** Growing communities in small towns, median age of 32.1, population growing 1.6 percent annually, educational attainment is lower than the U.S. average, mobile homes, one in five is Hispanic, mindful of their expenses, shop at discount stores, priorities are their families and cars, investing and saving for retirement are a low priority, watch NASCAR and other sports on TV, prefer country and contemporary hit music, read magazines, especially automotive, boating, motorcycle, and fishing publications, they go fishing and watch movies on DVD.



Under the "American Quilt" category, another 26 percent of the primary trade area households fall into the sub-category "Midland Crowd", described by ESRI as follows:

> ***Midland Crowd*:** Married-couple families, median age of 37.0, middle class, professional, management or skilled occupations, high school graduates or some college education, single family homes, mobile homes, white, have pets, hobbies are hunting and fishing, have personal line of credit, read hunting and fishing magazines, own or lease trucks.

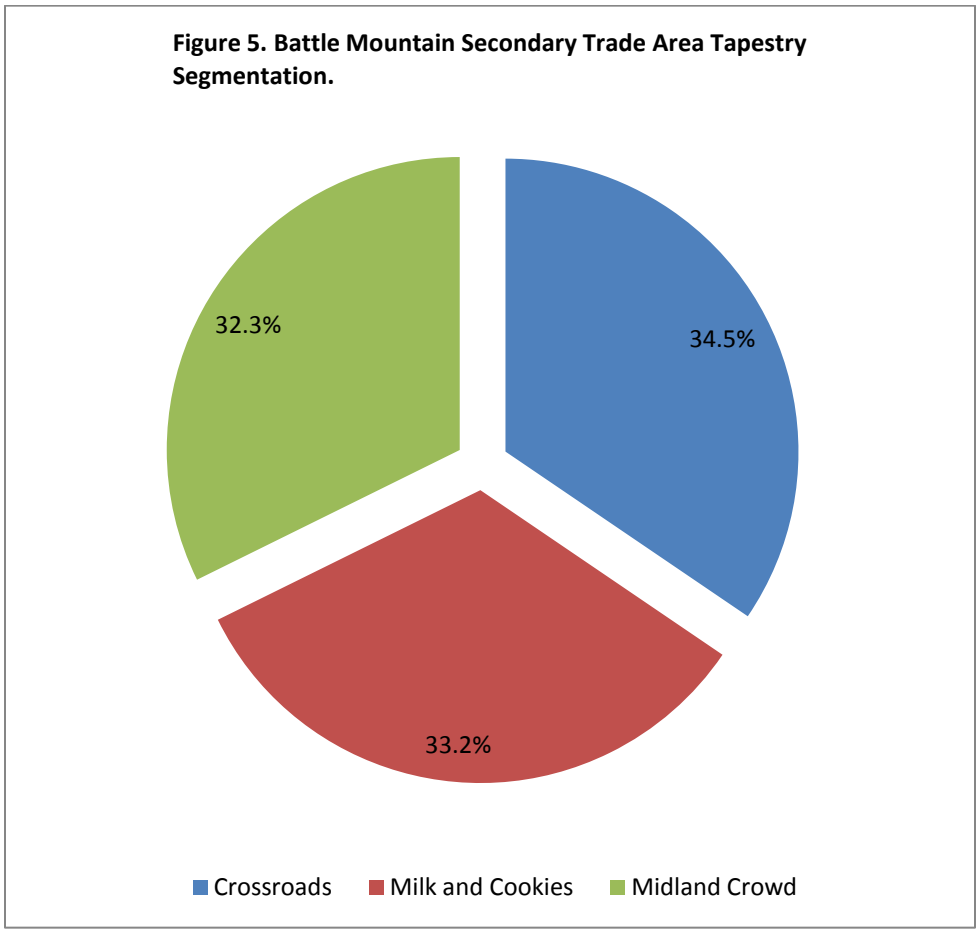
Under the "Family Portrait" category, the full 35.8 percent falls under "Milk and Cookies", described by ESRI as follows:

> ***Milk and Cookies*:** Young, affluent married couples who are starting families or already have young children, median age of 33.7, slightly above-average ratios of black and Hispanic residents, 71 percent in labor force, 58 percent have attended college, more than 20 percent hold bachelor's or graduate degrees, use a credit union, have overdraft protection, and usually have a new car loan, prefer larger vehicles, own a dog, frequently buy fast food and diners from grocery store to save time, watch sports, work on their lawns, tackle interior painting projects, or do maintenance on their vehicles

For full description of the Midland Crowd segment, Milk and Cookies, and Crossroads see Appendix C.

Battle Mountain Secondary Trade Area

The 1,925 households included in the larger Secondary Trade Area are similar to the Primary Trade Area. Figure 5 shows the similarity in sizes of the three categories. The three categories remain "Crossroads" (34.5 percent), "Midland Crowd" (33.2 percent), and "Milk and Cookies" (32.3 percent). Brief ESRI descriptions are below. See Appendix C for full descriptions.



***Crossroads*:** Married couples with and without children and single parents, median age 32.1, lower middle class, occupations in skilled trades or services, no high school diploma or high school graduates, mobile homes, white, hobbies are watching movies on DVD or playing volleyball and softball, do banking in person and read fishing and hunting magazines.

***Milk and Cookies*:** Young, affluent married couples who are starting families or already have young children, median age of 33.7, slightly above-average ratios of black and Hispanic residents, 71 percent in labor force, 58 percent have attended college, more than 20 percent hold bachelor's or graduate degrees, use a credit union, have overdraft protection, and usually have a

new car loan, prefer larger vehicles, own a dog, frequently buy fast food and diners from grocery store to save time, watch sports, work on their lawns, tackle interior painting projects, or do maintenance on their vehicles.

***Midland Crowd*:** Married-couple families, median age of 37.0, middle class, professional, management or skilled occupations, high school graduates or some college education, single family homes, mobile homes, white, have pets, hobbies are hunting and fishing, have personal line of credit, read hunting and fishing magazines, own or lease trucks.

Battle Mountain Tertiary Trade Area

The tertiary trade area includes Golconda, Winnemucca, Battle Mountain, Crescent Valley and Carlin. This Tertiary Trade area holds 8,865 households and a population of 25,177. The Tertiary area contains new Life Mode Groups such as "High Society", containing 8.3 percent of the total households, and "Traditional Living", containing 7.6 percent of tertiary households. These categories are described as below:

***High Society*:** Affluent, well-educated, married-couple homeowners.

***Traditional Living*:** Hardworking, settled families.

Figure 6. Battle Mountain Tertiary Trade Area Tapestry Segmentation.

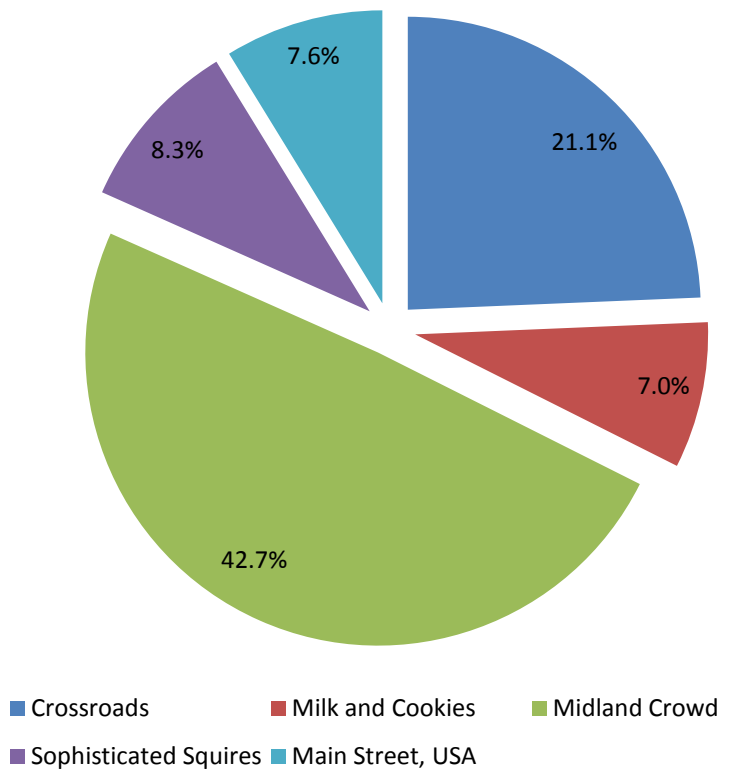


Figure 6 illustrates the ESRI tapestry segmentation for Battle Mountain Tertiary Trade Area. There were six categories which indicate how diverse the larger tertiary region is. Almost 43 percent of the region's households are assigned to the Midland Crowd segment, and 21.1 percent to the Crossroads segment. Midland Crowd remains the dominant type of American Quilt household. The ESRI description of the "Sophisticated Squires" and "Main Street, USA" category is described below.

> ***Sophisticated Squires*:** Married couples with kids, median age 38.2, enjoy cultured country life, accept longer commutes to live near fewer neighbors, educated, many drive minivans or full-size SUVs, do-it-yourselfers, attend football or baseball games, listen to soft adult contemporary music and sports radio, favorite TV programs include, news, comedies, drama and home and garden.
>
> ***Main Street USA*:** Mix of household types, approximately ½ households are married-couple families, One-third are single-person or shared households, the rest are single-parent or other family households, median age is 36.7, less diverse than U.S. population, family oriented and frugal, may go out to eat or to movies but most likely stay home, own pet cats, listen to classic hits and rock radio, go to theme parks, beginning to shop online, watch cartoons and courtroom shows on TV.

A complete description of the Tapestry Segmentation Profiles as well as detailed distributions of the segments can be found in Appendix C.

Demographics

More detailed demographic data for the Battle Mountain trade areas is presented in Figures 7 through 19 and in Tables 1 through 7.

Population

Table 1. Population Trends, 2010 and 2015.

Trade Area	2010	2015	Percent Change	Number Change
Primary	4,916	4,682	-4.8%	-234
Secondary	5,412	5,218	-3.6%	-194
Tertiary	25,177	25,985	+3.2%	+808
Total Region	35,505	35,885	+1.1%	+32,380

Source: ESRI

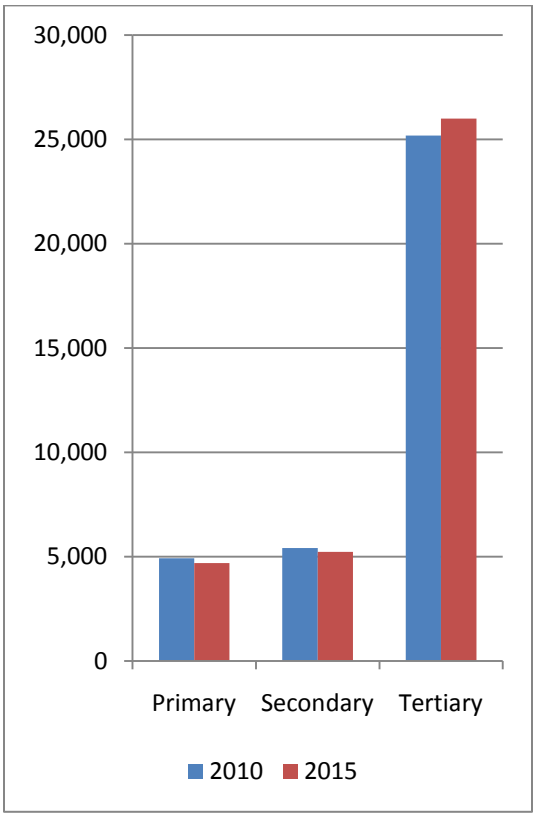


Figure 7. Population Trends, 2000 and 2015.

Summary

- The primary trade area in Battle Mountain is expected to decrease by 4.8 percent from 2010 to 2015.
- The Primary and Secondary trade areas are projected to decrease but the Tertiary trade area is expected to increase.
- The total region's population is expected to grow over 1 percent which in absolute terms is nearly 32,000 people.

Age Change Graphs, Primary Trade Area

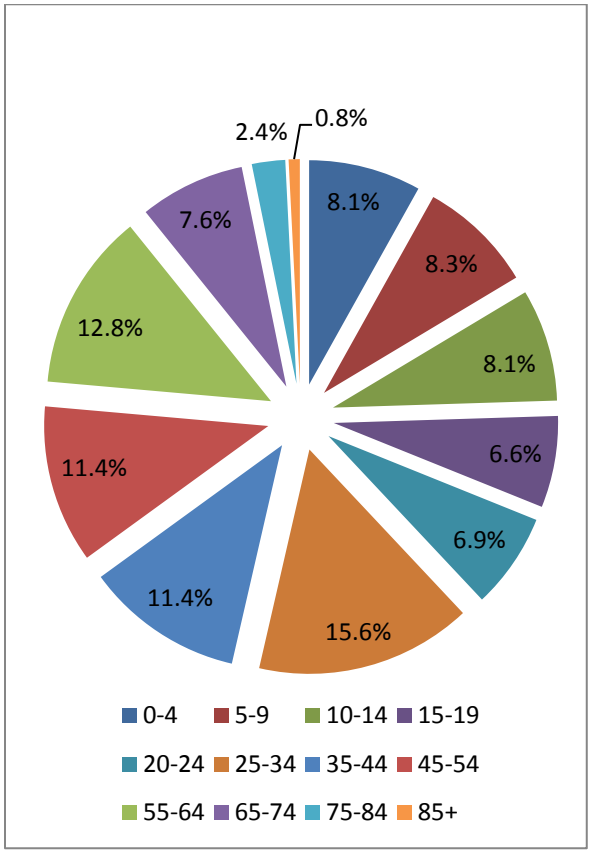


Figure 8. Primary Percent Age Distribution, 2010.

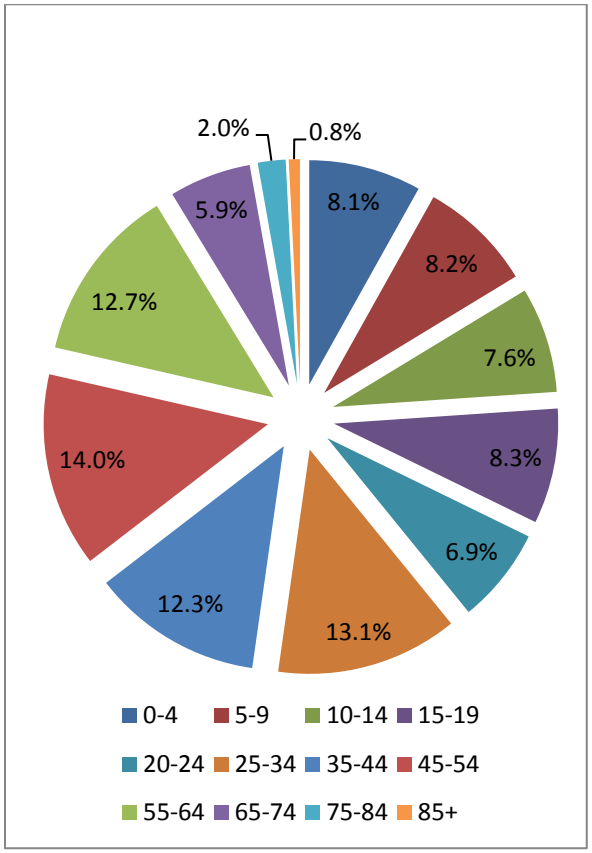


Figure 9. Primary Percent Age Distribution, 2015.

Summary:

- The age distribution in Battle Mountain's primary trade area is expected to change very little between 2010 and 2015.
    - In 2010, 39.1 percent of the population was between the ages 0 and 24. In 2015, this age group is expected to be 38 percent of the population.
    - In 2010, 25.4 percent of the population was between the ages 25 and 44. In 2015, this age group is expected to be 27 percent of the population.
    - In 2010, 26.7 percent of the population was between the ages 45 and 64. In 2015, this age group is expected to be 24.2 percent of the population.
    - In 2010, 8.7 percent of the population was 65 or older. In 2015, this age group is expected to be 10.8 percent of the population.

Age Change Graphs, Secondary Trade Area

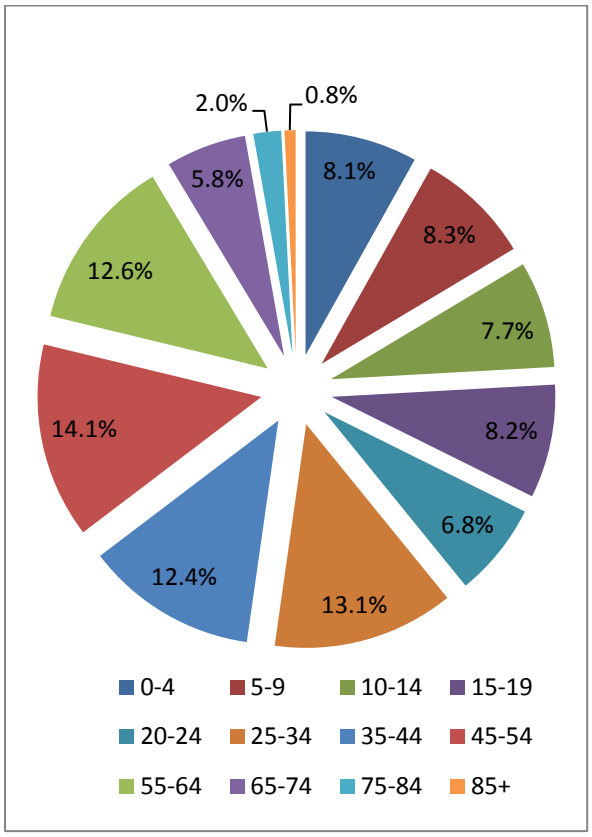


Figure 10. Secondary Percent Age Distribution, 2010.

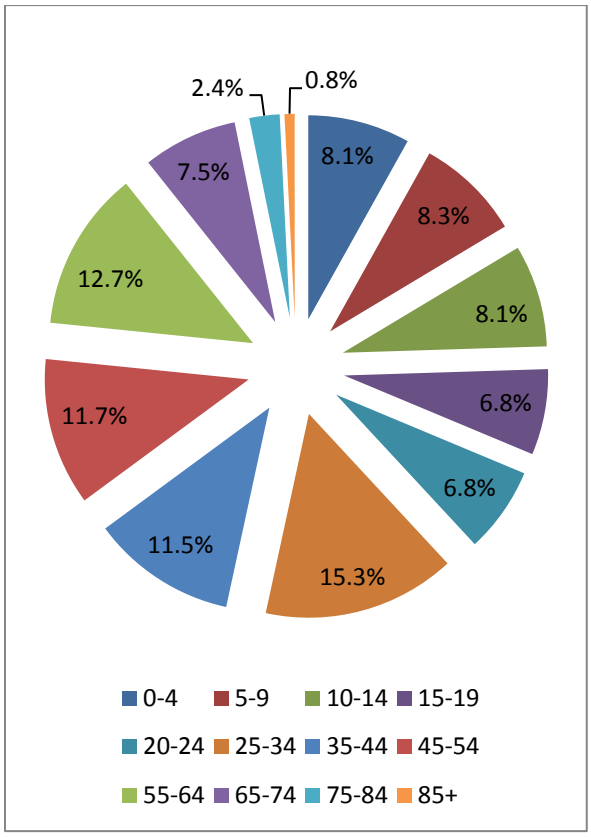


Figure 11, Secondary Percent Age Distribution, 2015.

Summary

- The age distribution in Battle Mountain's Secondary trade area is expected to change very little between 2010 and 2015.
  - In 2010, 39.1 percent of the population was between the ages 0 and 24. In 2015, this age group is expected to be 38.1 percent of the population.
  - In 2010, 25.5 percent of the population was between the ages 25 and 44. In 2015, this age group is expected to be 26.8 percent of the population.
  - In 2010, 26.7 percent of the population was between the ages 45 and 64. In 2015, this age group is expected to be 24.4 percent of the population.
  - In 2010, 8.6 percent of the population was 65 or older. In 2015, this age group is expected to be 10.7 percent of the population.

Age Change Graphs, Tertiary Trade Area

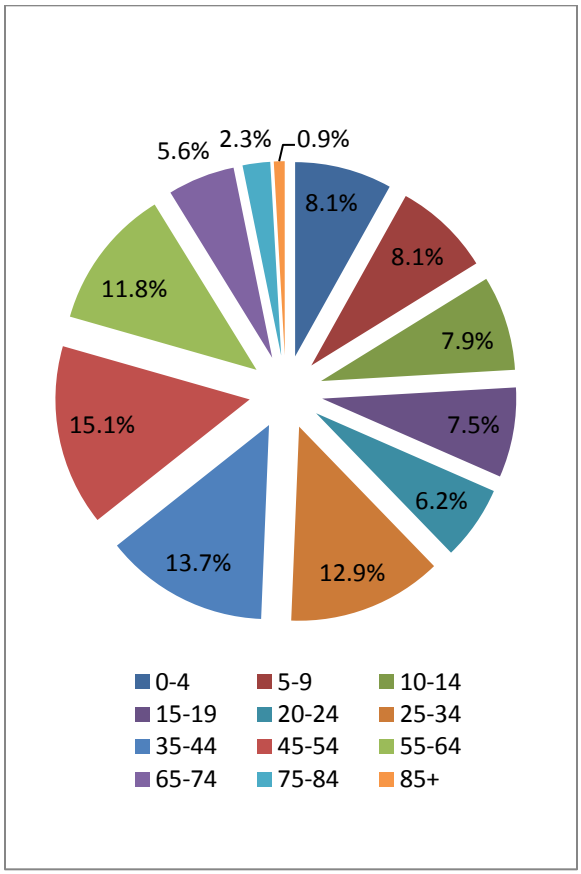


Figure 12. Tertiary Percent Age Distribution, 2010.

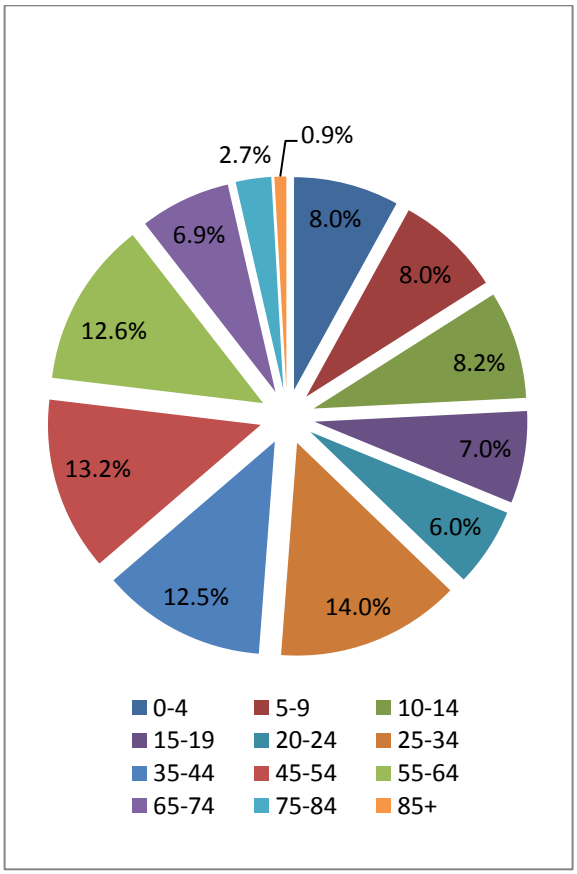


Figure 13. Tertiary Percent Age Distribution, 2015.

Summary:

- The age distribution in Battle Mountain's tertiary trade area is expected to change very little between 2010 and 2015.
  - In 2010, 37.8% of the population was between the ages 0 and 24. In 2015, this age group is expected to be 37.2 percent of the population.
  - In 2010, 26.6% of the population was between the ages 25 and 44. In 2015, this age group is expected to be 26.5 percent of the population.
  - In 2010, 26.9% of the population was between the ages 45 and 64. In 2015, this age group is expected to be 25.8 percent of the population.
  - In 2010, 8.8% of the population was 65 or older. In 2015, this age group is expected to be 10.5 percent of the population.

Table 2. Percent Age Distributions by Trade Area, 2010.

Percent	*0-4*	*5-9*	*10-14*	*15-19*	*20-24*	*25-34*	*35-44*	*45-54*	*55-64*	*65-74*	*75-84*	*85+*
Primary	8.1%	8.2%	7.6%	8.3%	6.9%	13.1%	12.3%	14%	12.7%	5.9%	2%	0.8%
Secondary	8.1%	8.3%	7.7%	8.2%	6.8%	13.1%	12.4%	14.1%	12.6%	5.8%	2%	.8%
Tertiary	8.1%	8.1%	7.9%	7.5%	6.2%	12.9%	13.7%	15.1%	11.8%	5.6%	2.3%	.9%
Total Population												
Primary	398	405	374	407	337	646	605	689	626	290	98	41
Secondary	441	449	419	446	367	707	672	765	682	315	106	43
Tertiary	2049	2030	1983	1884	1552	3242	3440	3811	2960	1420	591	215

Source: ESRI

Table 3. Percent Age Distributions by Trade Area, 2015.

Percent	*0-4*	*5-9*	*10-14*	*15-19*	*20-24*	*25-34*	*35-44*	*45-54*	*55-64*	*65-74*	*75-84*	*85+*
Primary	8.1%	8.3%	8.1%	6.6%	6.9%	15.6%	11.4%	11.4%	12.8%	7.6%	2.4%	0.8%
Secondary	8.1%	8.3%	8.1%	6.8%	6.8%	15.3%	11.5%	11.7%	12.7%	7.5%	2.4%	0.8%
Tertiary	8%	8%	8.2%	7%	6%	14%	12.5%	13.2%	12.6%	6.9%	2.7%	0.9%
Total Population												
Primary	377	387	381	311	324	730	532	535	597	357	113	38
Secondary	424	434	425	354	356	797	599	609	663	393	123	41
Tertiary	2086	2082	2125	1814	1561	3648	3248	3432	3286	1789	690	224

Source: ESRI

Table 4. Percent of Households by Income, 2010.

Percent	*< $15,000*	*$15,000-$24,999*	*$25,000-$34,999*	*$35,000-$49,999*	*$50,000-$74,999*	*$75,000-$99,999*	*$100,000-$149,999*	*$150,000-$199,999*	*$200,000+*
Primary	10.1%	7.5%	8.5%	14.4%	32%	15.2%	11%	1%	0.1%
Secondary	9.9%	7.5%	8.8%	14.6%	32.8%	14.4%	10.6%	0.9%	0.3%
Tertiary	8.6%	7.6%	8.6%	13.4%	33.0%	13.8%	12.1%	1.6%	1.3%
Total Population									
Primary	176	130	148	251	557	265	192	17	2
Secondary	190	144	170	282	632	278	205	18	6
Tertiary	764	675	759	1,192	2,927	1,224	1,069	141	114

Source: ESRI

Table 5. Percent of Households by Income, 2015.

Percent	*< $15,000*	*$15,000-$24,999*	*$25,000-$34,999*	*$35,000-$49,999*	*$50,000-$74,999*	*$75,000-$99,999*	*$100,000-$149,999*	*$150,000-$199,999*	*$200,000+*
Primary	7.7%	6%	7.1%	11.2%	34.1%	16%	16.3%	1.6%	0.1%
Secondary	7.4%	6%	7.3%	11.4%	35.3%	15.1%	15.7%	1.5%	0.4%
Tertiary	6.2%	5.9%	6.9%	9.9%	35.3%	14.2%	17.3%	2.6%	1.6%
Total Population									
Primary	127	100	117	186	565	265	270	26	2
Secondary	138	111	135	211	656	280	292	28	8
Tertiary	572	542	628	908	3,231	1,298	1,588	237	151

Source: ESRI

Household Income Distribution, Primary Trade Area

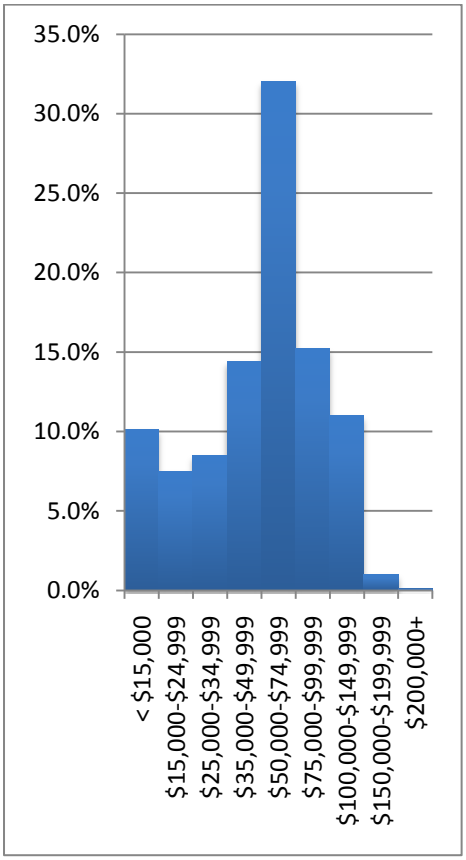


Figure 14. Household Income Distribution for Primary Trade Area, 2010.

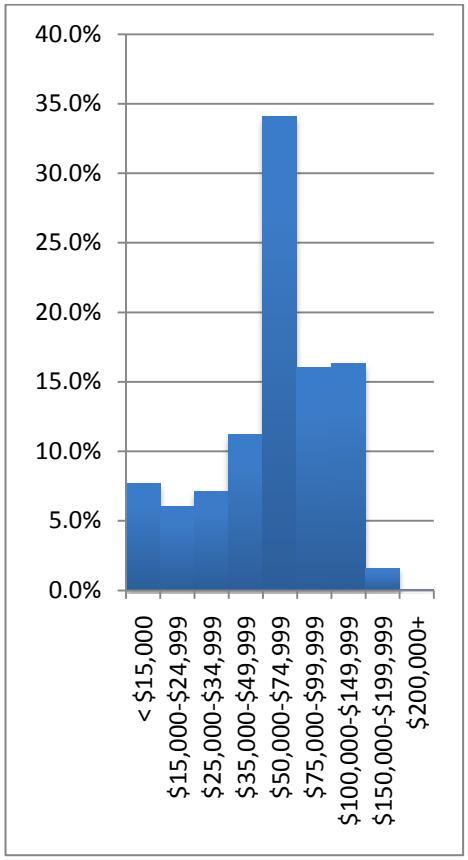


Figure 15. Household Income Distribution for Primary Trade Area, 2015.

Summary:

- The income distribution in 2010 was positively skewed meaning that there was a higher concentration on the left (smaller income) side in 2010. There were a large percentage of people in the median income level.
  - 40.5 percent earned less than $50,000, 32 percent earned between $50,000 and $74,999, and 27.3 percent earned $75,000 or more.
- The income distribution in 2015 shifts to more negatively skewed, meaning that there is a high concentration of the right (larger income) side. A large percentage of people remain in the median income level.
  - 32 percent earned less than $50,000, 34.1 percent earned between $50,000 and $74,999, and 34 percent earned $75,000 or more.

Household Income Distribution, Secondary Trade Area

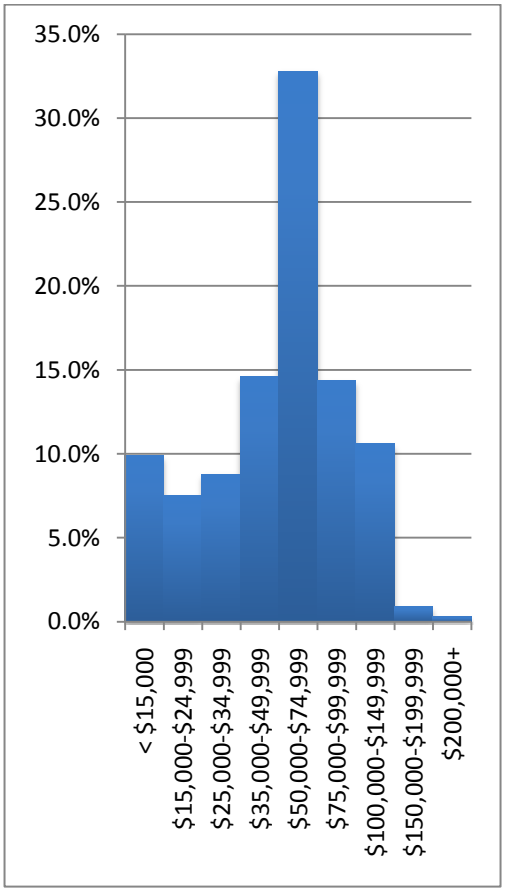


Figure 16. Household Income Distribution for Secondary Trade Area, 2010.

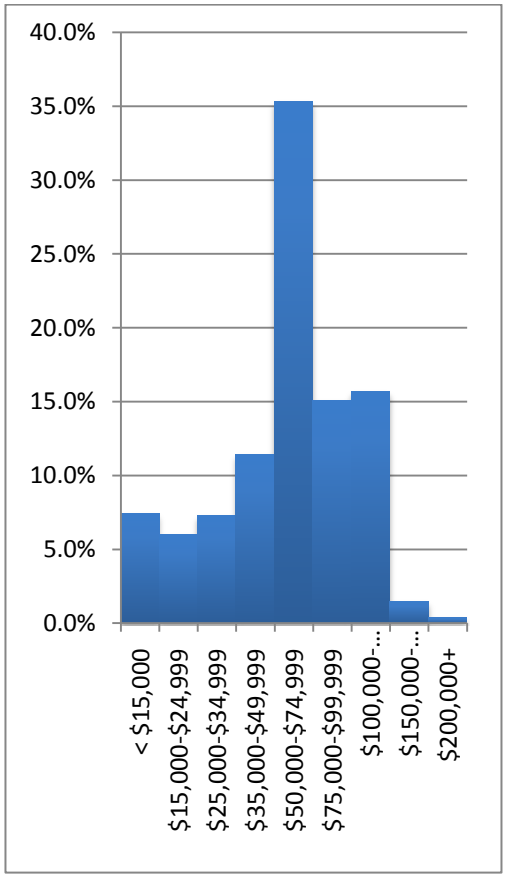


Figure 17. Household Income Distribution for Secondary Trade Area, 2015.

Summary:

- The income distribution was positively skewed meaning that there was a higher concentration on the left (smaller income) side in 2010. There were a high percentage of people in the median income level.
  - 40.8 percent earned less than $50,000, 32.8 percent earned between $50,000 and $74,999, and 27.3 percent earned $75,000 or more.
- The income distribution in 2015 is more normally distributed with a larger percentage of people in the median income intervals.
  - 32.1 percent earned less than $50,000, 35.3 percent earned between $50,000 and $74,999, and 32.7 percent earned $75,000 or more.

Household Income Distribution, Tertiary Trade Area

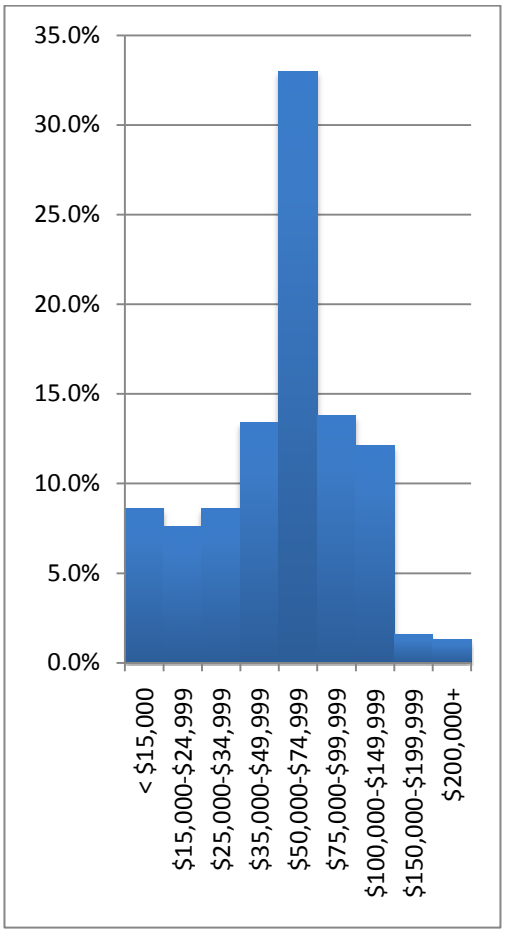


Figure 18. Household Income Distribution for Tertiary Trade Area, 2010.

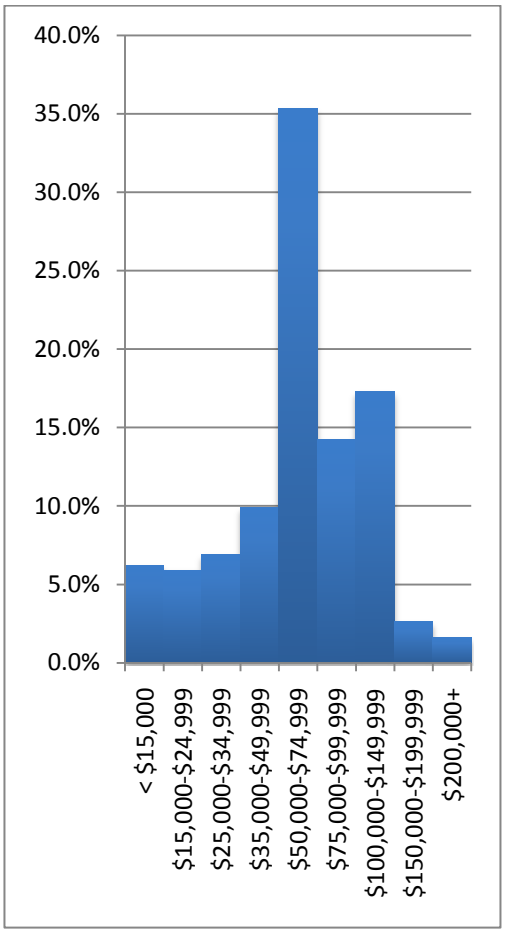


Figure 19 . Household Income Distribution for Tertiary Trade Area, 2015.

Summary:

- The income distribution was positively skewed meaning that there was a higher concentration on the left (smaller income) side in 2010.
    - 38.2 percent earned less than $50,000, 33 percent earned between $50,000 and $74,999, and 28.8 percent earned $75,000 or more.
- The income distribution in 2015 is negatively skewed meaning that there is projected to be a higher concentration on the right (larger income) side.
    - 28.9 percent earned less than $50,000, 35.3 percent earned between $50,000 and $74,999, and 35.7 percent earned $75,000 or more.

Table 6. Households Disposable Income, 2010.

Percent									
	< $15,000	*$15,000-$24,999*	*$25,000-$34,999*	*$35,000-$49,999*	*$50,000-$74,999*	*$75,000-$99,999*	*$100,000-$149,999*	*$150,000-$199,999*	*$200,000+*
Primary	12.1%	9.8%	10.5%	22.4%	29.3%	9.6%	6%	0.2%	0.1%
Secondary	11.8%	10%	10.9%	22.8%	29%	9.1%	5.8%	.03%	0.2%
Tertiary	10.5%	10.1%	10.4%	22%	28.6%	9.7%	7.1%	0.7%	0.8%
Total Population									
Primary	211	171	183	389	509	166	105	3	1
Secondary	228	193	209	439	559	176	112	5	4
Tertiary	932	891	926	1,953	2,539	863	627	59	75

Source: ESRI

Summary:

- Both median and average disposable income increase as the trade area expanded.
  - The median disposable income in the primary trade area was $45,645.
  - The average disposable income in the primary trade area was $50,272.
  - The median disposable income in the secondary trade area was $45,195.
  - The average disposable income in the secondary trade area was $50,468.
  - The median disposable income in the tertiary trade area was $47,175.
  - The average disposable income in the tertiary trade area was $54,766.

Table 7. Households Net Worth, 2010.

Percent										
	< $15,000	*$15,000-$34,999*	*$35,000-$49,999*	*$50,000-$74,999*	*$75,000-$99,99*	*$100,000-$149,999*	*$150,000-$249,999*	*$250,000-$499,999*	*$500,000-$999,999*	*$1,000,000+*
Primary	26.1%	8.2%	6.2%	11.2%	6.3%	9.7%	14.4%	12.1%	4.7%	1.1%
Secondary	25.8%	8.3%	6.2%	11.3%	6.3%	10%	14.2%	11.7%	4.4%	1.8%
Tertiary	23.1%	8.9%	6%	10%	6.8%	10.6%	14%	11.5%	5.2%	4%
Total Population										
Primary	453	143	108	195	109	169	250	211	81	19
Secondary	497	160	119	217	122	193	273	226	84	34
Tertiary	2,049	791	535	884	599	939	1,237	1,017	458	356

Source: ESRI

Summary:

- The median net worth increases as the trade area expanded.
  - The median net worth in the primary trade area was $70,058.
  - The median net worth in the secondary trade area was $70,465.
  - The median net worth in the tertiary trade area was $81,189.

Conclusions

Market segmentation can be used by Battle Mountain retailers to target their retail efforts. The information on these neighborhoods can be used in a variety of ways. First is for Battle Mountain merchants to better understand who their customers are – both actual and potential. Merchants who are able to gather detail customer spotting information can combine that with neighborhood types data to determine if their "best customers" are concentrated in only a couple neighborhood types. Who your customers are tells you a great deal about how your marketing strategy is perceived by customers. Merchants may then choose to focus on that segment of the market in order to capture more spending. Alternatively, merchants may try to make changes that will broaden their appeal and add customers from other types of neighborhoods – especially those Zip codes close to the store.

SECTION V

ANALYSIS OF RETAIL SECTOR SURPLUSES AND LEAKAGES

SECTION V

ANALYSIS OF RETAIL SECTOR SURPLUSES AND LEAKAGES

A goal of retail sector analysis for Battle Mountain is to identify retail sector categories that Battle Mountain decision-makers could target to fill existing demand that is leaking out of Battle Mountain. All retail sales and consumer expenditures data presented in this report were developed from ESRI business Analyst Online, a leading national provider of economic and demographic data.

Table 8 shows the existing retail sales ("Supply") in the study area and compares it to the retail potential ("Demand") of study area residents. Table 8 shows retail gap for all retail sectors. Positive values are sales leakages and negative values are sales surpluses.

Sales Leakage

The demand for goods and services that is not met locally is referred to as sales leakage. The sales leakage occurs because consumers make purchases at establishments located outside Battle Mountain. For example as for total Battle Mountain resident retail sales, Battle Mountain residents had retail sales in Battle Mountain of $12.6 million. However, Battle Mountain residents had retail trade expenditures of approximately $42.2 million. This means Battle Mountain residents had approximately $29.7 million of retail sales outside the Battle Mountain Study Area.

Sales Leakage

The demand for goods and services that is not met by Battle Mountain's retail sector is referred to as sales leakage. The leakage occurs because consumers made purchases at establishments located outside Battle Mountain Study Area. For example, there is approximately $19,456 of retail sales in the Building Materials, Garden Equipment, and Supply Stores Sector in the Battle Mountain Study Area; however, Battle Mountain Study Area residents spent approximately $1.5 million on these types of goods. Therefore, Battle Mountain Study Area residents spent approximately $1.498 million outside the study area on Building Material, Garden Equipment, and Supply Store goods. This is the money that has leaked out of the local study area. More retail sector categories exhibit sales leakage for the Battle Mountain Study Area.

Table 8. Spending Potential for Battle Mountain Study Area.

Industry Summary	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap (Demand - Supply)	Surplus / Leakage Factor	Number of Businesses
Total Retail Trade and Food & Drink (NAICS 44-45, 722)	$42,232,447	$12,573,839	$29,658,608	54.1	26
Total Retail Trade (NAICS 44-45)	$371,83,306	$171,512,861	$25,670,445	52.7	19
Total Food & Drink (NAICS 722)	$5,049,141	$1,060,978	$3,988,163	65.3	7
Transportation:					
Motor Vehicle & Parts Dealers (NAICS 441)	$8,669,846	$113,825	$8,556,021	97.4	2
Automobile Dealers (NAICS 4411)	$7,636,438	$0	$7,636,438	100.0	0
Other Motor Vehicle Dealers (NAICS 4412)	$589,234	$0	$589,234	100.0	0
Auto Parts, Accessories, and Tire Stores (NAICS 4413)	$444,174	$113,825	$330,349	59.2	2
Gasoline Stations (NAICS 447/NAICS 4471)	$13,041,772	$9,476,467	$3,565,305	15.8	2
Household and Garden Goods:					
Furniture & Home Furnishings Stores (NAICS 442)	$2,199,282	$0	$2,199,282	100.0	0
Furniture Stores (NAICS 4421)	$2,199,282	$0	$2,199,282	100.0	0
Home Furnishings Stores (NAICS 4422)	$0	$0	$0	0.0	0
Electronics & Appliance Stores (NAICS 443/NAICS 4431)	$0	$59,157	$-59,157	-100.0	1
Bldg Materials, Garden Equip. & Supply Stores (NAICS 444)	$1,517,256	$19,456	$1,497,800	97.5	1
Building Material and Supplies Dealers (NAICS 4441)	$1,517,256	$19,456	$1,497,800	97.5	1
Lawn and Garden Equipment and Supplies Stores (NAICS 4442)	$0	$0	$0	0.0	0
Apparel:					
Clothing and Clothing Accessories Stores (NAICS 448)	$1,405,182	$47,080	$1,358,102	93.5	1
Clothing Stores (NAICS 4481)	$1,145,754	$47,080	$1,098,674	98.1	1
Shoe Stores (NAICS 4482)	$0	$0	$0	0.0	0
Jewelry, Luggage, and Leather Goods Stores (NAICS 4483)	$259,428	$0	$259,428	100.0	0
Food and Beverages					
Food & Beverage Stores (NAICS 445)	$5,941,681	$1,472,167	$4,469,519	60.3	5
Grocery Stores (NAICS 4451)	$5,461,665	$1,391,869	$4,069,796	59.4	4
Specialty Food Stores (NAICS 4452)	$228,728	$0	$228,728	100.0	0

Industry Summary	Demand (Retail Potential)	Supply (Retail Sales)	Retail Gap (Demand - Supply)	Surplus / Leakage Factor	Number of Businesses
Beer, Wine, and Liquor Stores (NAICS 4453)	$251,288	$80,298	$170,990	51.6	1
Food Services & Drinking Places (NAICS 722)	$5,049,141	$1,060,978	$3,988,163	65.3	7
Full-Service Restaurants (NAICS 7221)	$257,634	$160,439	$97,195	23.2	2
Limited-Service Eating Places (NAICS 7222)	$4,107,738	$757,857	$3,349,881	68.8	3
Special Food Services (NAICS 7223)	$0	$0	$0	0.0	0
Drinking Places - Alcoholic Beverages (NAICS 7224)	$683,769	$142,682	$541,087	65.5	2
General merchandises:					
Health & Personal Care Stores (NAICS 446/NAICS 4461)	$0	$0	$0	0.0	0
General Merchandise Stores (NAICS 452)	$2,726,957	$110,792	$2,616,165	92.2	1
Department Stores Excluding Leased Depts. (NAICS 4521)	$1,814,846	$0	$1,814,846	100.0	0
Other General Merchandise Stores (NAICS 4529)	$912,111	$110,792	$801,319	78.3	1
Miscellaneous Store Retailers (NAICS 453)	$893,523	$137,068	$756,455	73.4	4
Florists (NAICS 4531)	$117,395	$16,667	$100,728	75.1	1
Office Supplies, Stationery, and Gift Stores (NAICS 4532)	$330,941	$34,172	$296,769	81.3	1
Used Merchandise Stores (NAICS 4533)	$82,832	$25,998	$56,834	52.2	1
Other Miscellaneous Store Retailers (NAICS 4539)	$362,355	$60,231	$302,124	71.5	1
Nonstore Retailers (NAICS 454)	$0	$0	$0	0.0	0
Electronic Shopping and Mail-Order Houses (NAICS 4541)	$0	$0	$0	0.0	0
Vending Machine Operators (NAICS 4542)	$0	$0	$0	0.0	0
Direct Selling Establishments (NAICS 4543)	$0	$0	$0	0.0	0
Sporting Goods, Hobby, Book, and Music Stores (NAICS 451)	$787,807	$76,849	$710,958	82.2	2
Sporting Goods/Hobby/Musical Instrument Stores (NAICS 4511)	$787,807	$43,037	$744,770	89.6	1
Book, Periodical, and Music Stores (NAICS 4512)	$0	$33,812	-$33,812	-100.0	1

Source: ESRI Business Information Solutions, 2009 Estimates and Projections, www.esribis.com

Sales leakages are normally viewed as an opportunity for unmet demand in the study area. This unmet study area demand could yield a potential to recapture lost retail dollars through creation of new local retail businesses. However, not all retail categories that exhibit leakage within a particular study area should automatically be assumed to be a good fit for that community's needs. It is also not likely that 100 percent of sales leakage in any one category would be recaptured if only there were additional local retailers of that type in Battle Mountain Study Area. Sometimes there are reasons for leakage, commuting patterns or a large retail specialty/cluster in another community that attracts Battle Mountain's Study Area residents.

Table 8 estimates the number of businesses in each retail industry sector that are located in the Battle Mountain Study Area. The industry with the highest number of businesses is the Food Services and Drinking Places Sector.

Sales Surpluses

Conversely, if the supply of retail goods sold exceeds study area demand, non-residents are assumed to be coming into the study area to spend money, creating a sales surplus. A sales surplus is shown as a negative value in Table 8. There are two reasons sales surpluses exist. First, a group of competing businesses offering a similar good or product may be located within the study area, creating a specialty cluster that draws in spending by households from outside the study area. Second, a sales surplus may indicate a saturation retail market, where supply exceeds demand.

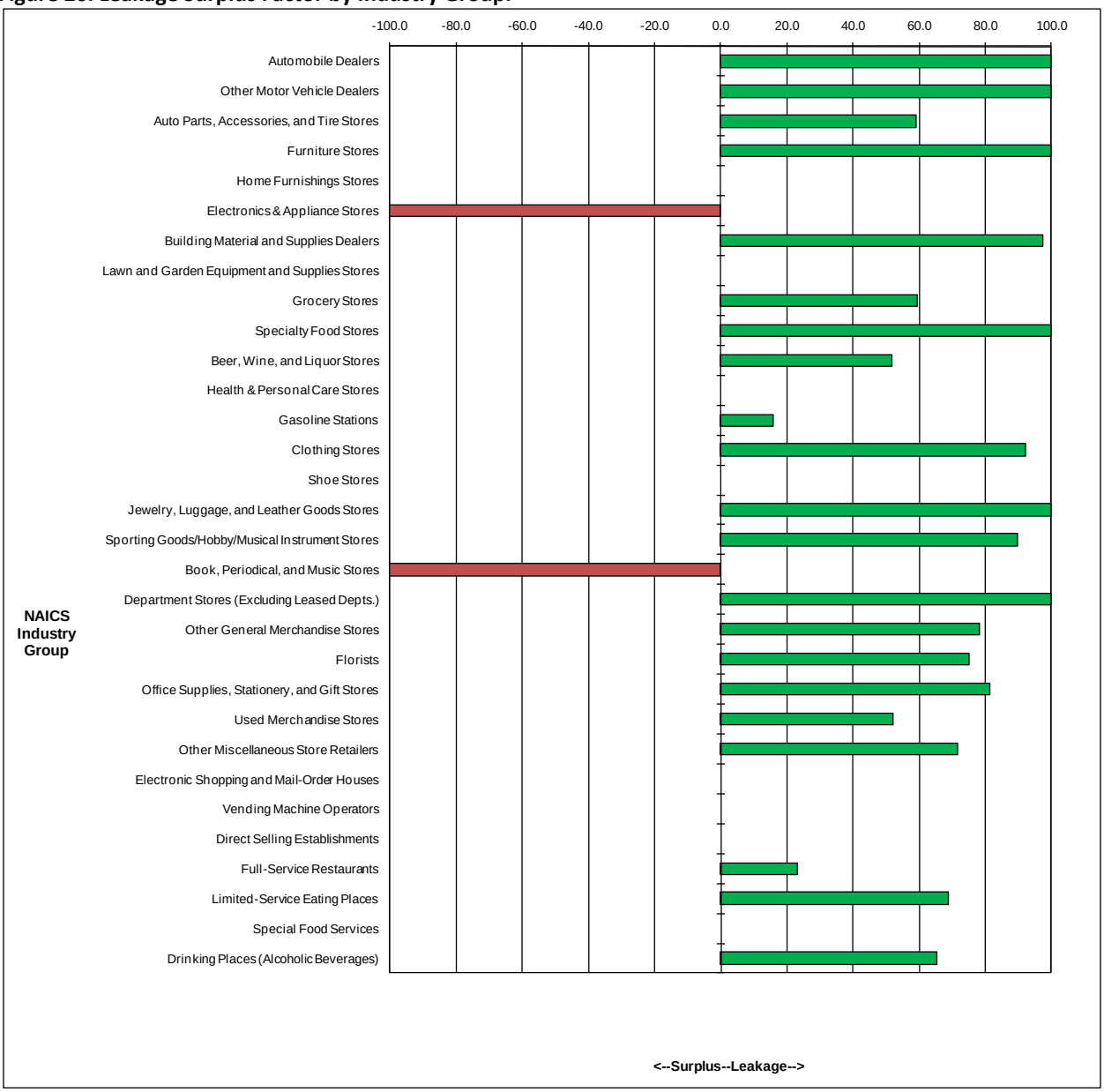
Figure 20 illustrates the surplus/leakage factor for the study area. This shows the degree to which demand for goods is being met within or outside of the study area in relation to total sales for that good. A factor of positive 100 would indicate that 100 percent of the demand is being met outside the study area boundaries. An example for the Battle Mountain Study Area would be the Furniture and Home Furnishing Stores Sector. The graph illustrates that a good portion of the retail sales for the Battle Mountain Study Area are leaking out to surrounding areas.

Retail Potential

While the previous part of this bulletin identifies the number of retail categories that are experiencing leakage, it should not be assumed that any leakage into a new business of that retail sector type will be successful in the Battle Mountain Study Area. This section identifies which of these retail categories exhibiting leakage have sufficient demand to

potentially support a new store. This analysis would provide community economic development practitioners a target retail sector that could potentially be successful.

Figure 20. Leakage Surplus Factor by Industry Group.



Using national sales average per store for different retail categories, the maximum number of stores in each retail category that could be supported if 50 percent of existing sales leakage from the Battle Mountain Study Area were recaptured by new businesses in Battle Mountain. The 50 percent recapture rate is arbitrary and can be changed for sensitivity analysis. It is likely that 100 percent surplus will not be captured so the 50 percent recapture estimate may be conservative.

Table 9 shows the results of the analysis. Categories highlighted are those with enough existing leakage that one or more stores could be supported. Food and Drinking Place Sector shows potential for three stores, while the Clothing and Clothing Accessories Store Sector shows a one store potential.

The support for Food Services and Dining Places Sector is consistent with Battle Mountain customer questionnaire. Since visitor demand, such as tourists, is not really captured by the sales leakage data, there is likely to be more spending to support these new business categories than suggested. There also may be other retail categories where one or more new businesses could be supported when the visitor market is taken into account.

Table 9. Retail Opportunity for Battle Mountain.

Industry Group	NATIONAL AVG SALES	RETAIL GAP IN BATTLE MOUNTAIN	50% RECAPTURE RATE	# OF POTENTIAL BUSINESSES
Motor Vehicle & Parts Dealers (NAICS 441)	$2,925,386.27	$8,556,021	$4,278,010.50	1.46
Automobile Dealers (NAICS 4411)	$5,312,248.59	$7,636,438	$3,818,219.00	0.72
Other Motor Vehicle Dealers (NAICS 4412)	$1,227,168.83	$589,234	$294,617.00	0.24
Auto Parts, Accessories, and Tire Stores (NAICS 4413)	$525,070.38	$330,349	$165,174.50	0.31
Furniture & Home Furnishings Stores (NAICS 442)	$833,639.87	$2,199,282	$1,099,641.00	1.32
Furniture Stores (NAICS 4421)	$1,143,612.23	$2,199,282	$1,099,641.00	0.96
Home Furnishings Stores (NAICS 4422)	$595,504.21	$0	$0.00	0.00
Electronics & Appliance Stores (NAICS 443/NAICS 4431)	$685,128.76	-$59,157	-$29,578.50	0.00
Bldg Materials, Garden Equip. & Supply Stores (NAICS 444)	$704,415.71	$1,497,800	$748,900.00	1.06
Building Material and Supplies Dealers (NAICS 4441)	$824,783.35	$1,497,800	$748,900.00	0.91
Lawn and Garden Equipment and Supplies Stores (NAICS 4442)	$280,412.47	$0	$0.00	0.00
Food & Beverage Stores (NAICS 445)	$2,370,478.77	$4,469,514	$2,234,757.00	0.94
Grocery Stores (NAICS 4451)	$3,675,637.59	$4,069,796	$2,034,898.00	0.55
Specialty Food Stores (NAICS 4452)	$328,353.85	$228,728	$114,364.00	0.35
Beer, Wine, and Liquor Stores (NAICS 4453)	$672,987.23	$170,990	$85,495.00	0.13
Health & Personal Care Stores (NAICS 446/NAICS 4461)	$877,006.48	$0	$0.00	0.00
Gasoline Stations (NAICS 447/NAICS 4471)	$4,032,667.17	$3,565,305	$1,782,652.50	0.44
Clothing and Clothing Accessories Stores (NAICS 448)	$542,666.84	$1,358,102	$679,051.00	1.25
Clothing Stores (NAICS 4481)	$632,946.17	$1,098,674	$549,337.00	0.87
Shoe Stores (NAICS 4482)	$414,768.62	$0	$0.00	0.00
Jewelry, Luggage, and Leather Goods Stores (NAICS 4483)	$333,652.15	$259,428	$129,714.00	0.39
Sporting Goods, Hobby, Book, and Music Stores (NAICS 451)	$321,303.24	$710,958	$355,479.00	1.11
Sporting Goods/Hobby/Musical Instrument Stores (NAICS 4511)	$219,321.58	$744,770	$372,385.00	1.70
Book, Periodical, and Music Stores (NAICS 4512)	$681,062.71	-$33,812	-$16,906.00	0.00
General Merchandise Stores (NAICS 452)	5038999.111	$2,616,165	$1,308,082.50	0.26
Department Stores Excluding Leased Depts. (NAICS 4521)	6029915.361	$1,814,846	$907,423.00	0.15
Other General Merchandise Stores (NAICS 4529)	4388121.469	$801,319	$400,659.50	0.09
Miscellaneous Store Retailers (NAICS 453)	190582.6866	$756,455	$378,227.50	1.98
Florists (NAICS 4531)	131912.9559	$100,728	$50,364.00	0.38
Office Supplies, Stationery, and Gift Stores (NAICS 4532)	230493.865	$296,769	$148,384.50	0.64
Used Merchandise Stores (NAICS 4533)	81303.83065	$56,834	$28,417.00	0.35
Other Miscellaneous Store Retailers (NAICS 4539)	238067.0046	$302,124	$151,062.00	0.63
Nonstore Retailers (NAICS 454)	3383324.546	$0	$0.00	0.00
Electronic Shopping and Mail-Order Houses (NAICS 4541)	10158533.98	$0	$0.00	0.00
Vending Machine Operators (NAICS 4542)	1322553.774	$0	$0.00	0.00
Direct Selling Establishments (NAICS 4543)	2117334.157	$0	$0.00	0.00
Food Services & Drinking Places (NAICS 722)	665426.8897	$3,988,163	$1,994,081.50	3.00
Full-Service Restaurants (NAICS 7221)	522128.7691	$97,195	$48,597.50	0.09
Limited-Service Eating Places (NAICS 7222)	910430.1195	$3,349,881	$1,674,940.50	1.84
Special Food Services (NAICS 7223)	1096784.372	$0	$0.00	0.00
Drinking Places - Alcoholic Beverages (NAICS 7224)	460989.6903	$541,087	$270,543.50	0.59

Conclusion

Retail sector surplus and leakage analysis can provide Battle Mountain economic development decision-makers information as to potential retail opportunities in Battle Mountain. Sales leakages occur because Battle Mountain consumers make purchases outside the community. Knowledge of this leakage can provide information as to potential retail sectors that could exist or expand in Battle Mountain to potentially fulfill these leakages. This is advantageous to Battle Mountain because the reduction in retail leakage would mean expansion in retail businesses, additional employment, and increase in quality of life. This data and other information supplied in this study could be used as input for a Battle Mountain retail sector strategic plan.

SECTION VI

BUSINESS DEVELOPMENT STRATEGIES TO CAPTURE LOCAL RETAIL SECTOR DEMANDS

SECTION VI

BUSINESS DEVELOPMENT STRATEGIES TO CAPTURE LOCAL RETAIL SECTOR DEMAND

Overview

While a county is justifiably concerned about the aggregate package of goods and services offered, it is often a single good or service that is the initial lure that attracts customers. All the merchants in the community benefit from the key good or service. In shopping centers, that key merchant is referred to as the shopping center "anchor." When a county examines its retail trade sector, there are three types of businesses to consider (Kivell and Shaw 1980). The first type is the generative business that produces sales by itself or attracts customers to the county, such as a shopping center anchor. The second type is the shared business that secures sales from the generative power of nearby businesses; an example is a small specialty store located near a large merchandise store. The third type is the business whose sales are a coincidental occurrence to other activities. Such businesses do not generate sales themselves nor from association with nearby shops. Examples are small ice cream shops, t-shirt shops and cafes in a shopping mall. For the county to realize its retail trade potential, a balance among the different categories of retail shops must be struck.

Retail Sector Development Strategies

Concerned leaders and business persons can focus on retail sector development by forming a business assistance committee to begin implementing some of the assistance activities or working with the existing chamber of commerce. The following activities may improve the climate for business and show the community's commitment to support local business. They were developed and implemented in many other communities although not all are appropriate for any one community or county. These can be the foundation for a retail sector improvement program.

Analyze the local business sector to identify the needs and opportunities to be pursued by the program. Businesses often do not have the resources to study the economy (local, regional and national) and how they fit in. They need practical data and analysis that will help in their individual business decision making. In particular, economic analysis can identify voids in the local or regional market that can possibly be filled by expanding or by new businesses. Examples of such analysis include the retail leakage analysis and consumer surveys to identify needs and opportunities as reported in this

publication. The retail leakage analysis in this publication can be very useful to help a community identify particular businesses in which there may be significant local demand. Such an analysis can then be used to attract merchants to the area. Also, developing GIS data could provide information as to available retail space in the area. Assistance with such analyses can often be found from the local Cooperative Extension office of the University of Nevada, Reno or more detailed analyses are available from the Nevada Small Business Development Center, Bureau of Business and Economic Research and the University Center for Economic Development in Reno.

In addition to economic analysis, information is useful about business districts as a whole. For example, perhaps the appearance of buildings and vacant lots is detrimental to attracting people to the business district; perhaps poorly coordinated store hours are a hindrance; or maybe the zoning regulations are locating the businesses inconveniently with respect to the residential population. Once these needs are identified, a business development program can initiate action. A periodic survey of business needs can form the basis of a business development program work plan.

Provide management assistance and counseling to improve the efficiency and profitability of local businesses. Many local businesses are owner-operated, earn low profits and have difficulty obtaining financing. For example, a business may need help in preparing a business plan to qualify for financing to start or expand its operation. Business owners often need additional education and training in improving business management skills like accounting, finance, planning, marketing, customer relations, merchandising, personnel management, or tax procedures. This assistance can be provided through seminars and one-to-one aid. Sources of assistance include the Small Business Development Center program sponsored by the Small Business Administration and operated through the University of Nevada, vocational technical centers, Service Corps of Retired Executives (SCORE) and the Cooperative Extension service. The intent is to aid small businesses in becoming more competitive.

Assist new business start-ups and entrepreneurial activity by analyzing potential markets and local skills and matching entrepreneurs with technical and financial resources. The Nevada State Economic Development Commission and local Economic Development Authorities are often actively attempting to attract such new businesses. Establishing a business incubator is another way to assist new businesses. An incubator is a building with shared space or service requirements that reduce start-up costs for new businesses. Incubators have been successful in many locations, but are not right

for every town. A successful incubator must have long-range planning, specific goals and good management in order to identify markets and entrepreneurs.

Provide assistance in identifying and obtaining financing. Small businesses often have difficulty obtaining long-term bank financing for expansion because they lack assets to mortgage, cannot obtain affordable terms or rates, or cannot present a strong business plan. A business development program can identify public loan programs (such as Industrial Development Bonds) and package them with private loans to make projects feasible, as well as provide assistance in undertaking joint projects for the business district:

- Improving street appearance
- Improving management of retail area
- Building renovation
- Preparation of design standards
- Joint promotions and marketing
- Organizing independent merchants
- Special activities and events
- Fund raising
- Improving customer relations
- Uniform hours of operations

Undertaking these projects requires cooperation, organization and efficient management. These projects can improve a business district's competitive position and attract new customers. The Main Street program provides many good examples of towns such as Carson City or Yerington working for economic revitalization. The Main Street Program developed by the National Trust for Historic Preservation is built around the four points of organization, design, promotion, and economic restructuring.

Develop a one-stop permit center. There is a great deal of red tape involved in starting a business including registering a name; choosing a legal form; and determining what licenses, permits, or bonds are needed. In a local community this may require visits to the building department, planning department, health department, business license bureau and other local agencies. Other concerns include internal revenue service requirements, unemployment insurance, sales tax permits, and workmen's compensation insurance.

Involve active local organizations and the media. Groups such as the chamber of commerce, civic clubs, etc. can encourage a healthy business climate. The local media can also support small business and aid in developing awareness of the importance of local business.

Promote the development of home based enterprises. Home-based work by individuals is increasing because of the flexibility offered and because in some areas it may be the most realistic alternative. Home-based enterprises can include a variety of full or part-time occupations such as consulting, tele-commuting, food processing, quilting, weaving, crafts, clothing assembly, mail order processing, or assembling various goods.

Strategic Planning for Retail Sector Development in Battle Mountain

Results of Battle Mountain retail sector market analysis and analysis of purchase patterns of Battle Mountain populace show some retail sectors that could be targeted by Battle Mountain decision-makers. Both analyses indicate that general merchandise stores, new and used car dealerships, automobile supply stores, clothing and shoe stores, furniture stores, major appliance stores, and small appliance stores should be investigated for potential development or relocation. Also other retail sector services such as home health care services, child day care services, residential care services, and computer and software services should be investigated.

Given the results of this study, Battle Mountain decision-makers might consider developing a retail sector targeting committee. A targeting committee would target retail sector development programs and efforts at specific retail industries or clusters of related retail industries. A retail targeting program identifies industries for which a county offers a competitive advantage in terms of labor skills and availability, location, and availability of public services. A target approach enables community leaders to focus recruitment, retention and expansion, and small business development programs rather than attempting to provide assistance for many different types of retail sector types. This tailoring of retail sector initiatives provides three advantages for a community:

- Targeting permits clearer identification of specific retail industry requirements and needs;
- Targeting enables the community to provide (for a given budget expenditure) fewer but more highly valued programs, and
- Targeting reduces the amount of financial incentives (e.g., tax rebates or labor training programs) needed to encourage the retail industry to locate in the region.

In order to develop a successful retail sector targeting several steps are suggested:

Step 1. Develop a Retail Sector Targeting Committee

This committee should include retail sector and decision makers, i.e. county commissioners and county government employees in Lander County.

Step 2. *Complete a Visioning and Goal Setting Exercise*

Battle Mountain may want to complete a visioning and goal setting exercise. These goals and visions are presented in a publication titled, "Economic Vitality Strategic Plan."

Step 3. *Data Gathering and Analysis of Local Retail Sector*

This step will provide the retail sector targeting committee information pertaining to current Battle Mountain retail sector activity. Results of this analysis could be used by the retail sector targeting committee. The geographic information system (GIS) analysis will provide information on location of current retail sector industries in Battle Mountain. Results of the GIS analysis can be used to derive a more focused trade analysis for specific retail sectors and in specific areas of Battle Mountain.

The primary objective of this step is to provide a basis for potential impacts in Battle Mountain from targeted retail sector development. This step provides historic data and can assist in focusing retail sector goals and targets for Battle Mountain.

Step 4. *Potential Project Identification*

This step leads the targeting committee through a structural criteria-based process to assist in objectively choosing projects for retail sector targeting. This process would employ data collected in the previous step, the GIS analysis and fiscal impact model. This step will allow the targeting committee to set priorities for Battle Mountain retail sector development. Priorities could be short-term or long-term retail sector projects as well as delegating responsibilities.

Step 5. *Review and Update of Targets*

This step is long-term in nature. Hopefully the retail sector targeting committee can have a long-term existence. This would provide an annual review of targeting goals and revision of goals as changes occur in Battle Mountain.

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APPENDIX A

BATTLE MOUNTAIN
BUSINESS OWNER QUESTIONNAIRE

Cover Letter

University of Nevada
Cooperative Extension

Dear Business Owner:

Last month we sent you the **Battle Mountain Business Operators Survey.** The survey is a part of a cooperative research effort sponsored by Lander County Sustainable Development Committee. Because Battle Mountain has a "boom and bust" economy related to regional mining activity, local citizens created Project FIND to explore ways to create a more sustainable, stable economy in Battle Mountain. Sustainable economies are supported in large part by existing local business owners and operators.

The response to this survey has been quite successful as 30 percent of all Battle Mountain business owners have participated so far. However, we can most accurately describe the current entrepreneurial climate in Battle Mountain with a larger number of respondents and greater variety of business owners.

If you have not yet responded, please consider doing so today. Your participation ensures that concerns specific to your business will be considered by decision makers such as Lander County Commissioners when creating business development strategies.

The enclosed survey allows you tell us about the current entrepreneurial climate of Battle Mountain and how this entrepreneurial climate could be improved to support existing and new local entrepreneurs. Your anonymous answers will be the cornerstone in developing better entrepreneurial climate and education programs to enhance local entrepreneurship activities. The time to complete the survey is estimated to be about 35 minutes. When completing the survey you should use a **No. 2 pencil or black pen**. A postage-paid return envelope has been provided for you to mail back your survey.

- **Why should I fill out this survey?** To help us develop a plan to vitalize and encourage entrepreneurship in Battle Mountain.
- **Do I have to fill in all the questions?** The more information you provide, the more accurate and useful our analysis will be. Completing the survey is voluntary and all information is confidential.
- **How are the boundaries of Battle Mountain entrepreneurship defined?** Battle Mountain entrepreneurs are considered to be entrepreneurs who live within the city limits of Battle Mountain.
- **How do I return my survey?** A postage-paid return envelope has been provided for you to mail back your survey.
- **What is the deadline?** Please return your survey no later than Friday, June 11.

This project is a cooperative research effort sponsored by Project FIND (Future Industrial Need Discovery, Lander County Sustainable Development Committee, and funded by the Lander County Commissioners. We appreciate your time and look forward to your responses. Key findings will be reported to the public as soon as they are available via local media.

Thank you,

Thomas R. Harris
Professor and Director

Survey

University of Nevada
Cooperative Extension

Battle Mountain Business Operators Survey

1. How strongly do you agree or disagree with the following statements? (Mark ONE answer for each statement.)

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Strongly Disagree
Local police protection is outstanding	☐	☐	☐	☐	☐
I feel safe downtown, even at night	☐	☐	☐	☐	☐
Local fire protection is outstanding	☐	☐	☐	☐	☐
I try to buy products and services locally	☐	☐	☐	☐	☐
I seek ways to cooperate with local businesses	☐	☐	☐	☐	☐
The existing local business mix helps my business	☐	☐	☐	☐	☐
The look and feel of downtown helps my business	☐	☐	☐	☐	☐
My building façade draws customers into my business	☐	☐	☐	☐	☐
Housing for employees is readily available	☐	☐	☐	☐	☐
Childcare for employees and customers is readily available	☐	☐	☐	☐	☐
Battle Mountain has a positive image that attracts customers	☐	☐	☐	☐	☐
Battle Mountain is an excellent place to have a business	☐	☐	☐	☐	☐

2. Please rate the degree to which you are experiencing the following business challenges. (Mark ONE answer for each item.)

	Major Challenge	Minor Challenge	No Challenge	Don't Know
Conflict with building owner or tenant	☐	☐	☐	☐
Difficulty recruiting or retaining employees	☐	☐	☐	☐
Expensive or unavailable products	☐	☐	☐	☐
Expensive employee wages or benefits	☐	☐	☐	☐
Expensive rent	☐	☐	☐	☐
Product deliver/loading challenges	☐	☐	☐	☐
Insufficient financing	☐	☐	☐	☐
Insufficient parking	☐	☐	☐	☐
Internet competition	☐	☐	☐	☐
Out-of-town competition	☐	☐	☐	☐
Language barriers	☐	☐	☐	☐
Poor building condition	☐	☐	☐	☐
Restrictive business regulations	☐	☐	☐	☐
Shoplifting or theft	☐	☐	☐	☐
Unskilled workers	☐	☐	☐	☐
Vandalism/Graffiti	☐	☐	☐	☐
Loitering near business	☐	☐	☐	☐
Perceived safety	☐	☐	☐	☐
Generation of new customers	☐	☐	☐	☐
Other (please specify)_____	☐	☐	☐	☐

3. Could you use information on or assistance with the following topics? (Mark ONE answer for each item.)

	Definitely	Probably	Unsure	Probably Not	Definitely Not
Business Planning	☐	☐	☐	☐	☐
Financial Management	☐	☐	☐	☐	☐
Inventory Management	☐	☐	☐	☐	☐
Marketing/Branding/Advertising	☐	☐	☐	☐	☐
Employee Hiring/Training	☐	☐	☐	☐	☐
Customer Service/Hospitality	☐	☐	☐	☐	☐
Building Improvements	☐	☐	☐	☐	☐
Window Displays/Interior Store	☐	☐	☐	☐	☐
Internet Service	☐	☐	☐	☐	☐
E-Commerce/Web Design	☐	☐	☐	☐	☐
Buying/Selling a Business	☐	☐	☐	☐	☐
Professionalism of Employees	☐	☐	☐	☐	☐
Other (please specify) _____	☐	☐	☐	☐	☐

If your business is NOT downtown, go to question 6

4. What are the two biggest reasons people stop downtown (i.e. specific establishment, attraction or activity)?

a. _____ b. _____

5. How useful to your downtown business are (could be) the following services? (Mark ONE answer for each item.)

	Very Useful	Useful	Useless	Don't Know
Group business training (i.e. workshops, speakers)	☐	☐	☐	☐
Cooperative advertising coordination	☐	☐	☐	☐
Marketing of Main Street district as shopping destination	☐	☐	☐	☐
Façade grants (if guidelines met)	☐	☐	☐	☐
Downtown public improvements projects	☐	☐	☐	☐
Web site or Internet resources	☐	☐	☐	☐
Retail event coordination	☐	☐	☐	☐
Special event coordination	☐	☐	☐	☐

6. Which technical or financial assistance programs* have you used for your business? (Mark ONE answer for each item.)

*Information on these programs is available at http://www.nvda.net/pdf/doing_bixnis.pdf.

	Used in Past Year	Will Use in Next Year	Don't Know About	Won't Use
Service Corps of Retired Executives (SCORE) Tech Assistance	☐	☐	☐	☐
Small Business Development Centers (SBDC) Tech Assistance	☐	☐	☐	☐
Nevada Microenterprise	☐	☐	☐	☐
Nevada Rural Development Corporation	☐	☐	☐	☐
Small Business Administration (SBA) Financing Programs	☐	☐	☐	☐
Regional/Local Revolving Loan Funds	☐	☐	☐	☐
USDA Rural Development Loans and Guarantees	☐	☐	☐	☐
Banks	☐	☐	☐	☐
Credit Unions	☐	☐	☐	☐
Community Development Block Grant	☐	☐	☐	☐

7. Who do you see as your major competition (local or out of town)?

_____

_____

8. **What three businesses complement your business the most? (Specify up to THREE businesses.)**

a. _____

b. _____

c. _____

9. **How satisfied are you with the present location of your business? (Mark one.)**

- ☐ Very Satisfied
- ☐ Satisfied
- ☐ Neutral
- ☐ Unsatisfied
- ☐ Very Unsatisfied
- ☐ Plan to Move

Why?_____

_____

_____

10. **Do you have plans to expand or reduce operations of your business in the next year? (Mark one.)**

- ☐ I plan to expand products/services or square footage downtown.
- ☐ I plan to expand products/services or square footage at a location outside the downtown.
- ☐ I plan to reduce products/services or square footage downtown.
- ☐ I plan to reduce products/services or square footage outside of downtown.
- ☐ I don't have any plans for changes.

11. **If financial assistance were available, would you consider building improvements such as façade work or new signage?**

- ☐ Yes
- ☐ No
- ☐ Don't Know

12. **How many years has your business (mark one in each column):**

	Been in Operation?	Been at Current Location	Been Under Current Ownership?
Under 1	☐	☐	☐
1 to 5	☐	☐	☐
6 to 10	☐	☐	☐
11 to 20	☐	☐	☐
Over 20	☐	☐	☐

13. **Does your business own or lease the space in which it is located?**

- ☐ Own
- ☐ Lease
- ☐ Lease, want to purchase

14. **How many square feet are devoted to your business?**

_____ sq. f. Total Space

15. **Where do your Customers typically park? (Mark one.)**

- ☐ On the street
- ☐ In a public parking lot
- ☐ In a private parking lot

How far do CUSTOMERS typically have to park from your business? (Mark one.)

- ☐ Near entry
- ☐ ½ block away
- ☐ 1 block away
- ☐ 2 blocks away
- ☐ 3 blocks away

16. **Where do you and your EMPLOYEES park? (Mark one.)**

- ☐ On the street
- ☐ In a public parking lot
- ☐ In a private parking lot

How far do you and your EMPLOYEES typically have to park from your business? (Mark one.)

- ☐ Near entry
- ☐ ½ block away
- ☐ 1 block away
- ☐ 2 blocks away
- ☐ 3 blocks away

If you own a parking lot, how many parking spaces are available for EMPLOYEES (not customers)?

_____

17. **What % of your EMPLOYEES live in Battle Mountain?** _____%

How many people including owners:

Are fulltime year round (32 or more hrs/wk)_____

Are part-time year round (less than 32 hrs/wk)_____

Are seasonal employees_____

18. What are the three busiest and slowest months of the year for this business? (Mark three in each column.)

	Busiest Months	Slowest Months
January	☐	☐
February	☐	☐
March	☐	☐
April	☐	☐
May	☐	☐
June	☐	☐
July	☐	☐
August	☐	☐
September	☐	☐
October	☐	☐
November	☐	☐
December	☐	☐

19. What are the hours of operation of your business?

	Busiest Months		Slowest Months	
	Open	Close	Open	Close
Monday				
Tuesday				
Wednesday				
Thursday				
Friday				
Saturday				
Sunday				

20. How many customer transactions do you do per week during (mark one in each column):

	Busiest Months	Slowest Months
None, all business via phone or Web	☐	☐
Less than 50	☐	☐
50 to 250	☐	☐
250 to 500	☐	☐
Over 500	☐	☐

21. If additional chain stores were to open in the area, how would you adapt?

_____

_____

_____

_____

22. During an average week of the year, what are the busiest times for your business? (Mark up to FOUR times.)

	Before 11:00 am	11:00 am - 2:00 pm	2:00 pm - 5:00 pm	After 5:00 pm
Monday	☐	☐	☐	☐
Tuesday	☐	☐	☐	☐
Wednesday	☐	☐	☐	☐
Thursday	☐	☐	☐	☐
Friday	☐	☐	☐	☐
Saturday	☐	☐	☐	☐
Sunday	☐	☐	☐	☐

23. Which local events (past or present) increase sales volume for your business, either during the event or in the days that follow? (List up to five.)

b. _____

c. _____

d. _____

e. _____

f. _____

24. How important are the following consumer segments to your business? (Mark ONE on <u>each row</u>.)

	Very Important	Important	Not Important	Not Sure
<u>Gender</u>:				
Males	☐	☐	☐	☐
Females	☐	☐	☐	☐
<u>Age</u>:				
under 18	☐	☐	☐	☐
18 to 24	☐	☐	☐	☐
25 to 44	☐	☐	☐	☐
45 to 54	☐	☐	☐	☐
55 to 64	☐	☐	☐	☐
Over 64	☐	☐	☐	☐
<u>Household Income</u>:				
Low ($0 to $30,000)	☐	☐	☐	☐
Medium ($30,000 to $75,000)	☐	☐	☐	☐
High ($75,000 +)	☐	☐	☐	☐
<u>Segment</u>:				
Residents	☐	☐	☐	☐
2nd Homes	☐	☐	☐	☐
Tourists	☐	☐	☐	☐
Californians	☐	☐	☐	☐

25. Do the following traits help make your business more competitive? (Mark ONE answer for each item.)

	A Lot	A Little	Not at All
Your Location	☐	☐	☐
Your Parking	☐	☐	☐
Your Hours	☐	☐	☐
Your Service	☐	☐	☐
Your Brand Names	☐	☐	☐
Your Quality	☐	☐	☐
Your Selection	☐	☐	☐
Your Price	☐	☐	☐

26. What additional businesses would you most like to see downtown? (Mark up to FOUR in each column.)

Retail Businesses	Service Business
☐ Appliance, TV, Elec.	☐ Accounting/Tax
☐ Art Dealers	☐ Bank
☐ Bakery	☐ Bar/Grill
☐ Beer/Wine/Liquor	☐ Barber/Beauty Salons
☐ Book and News	☐ Child Day Care
☐ Building Materials	☐ Chiropractor
☐ Butcher/Meat Shop	☐ Coffee Shop
☐ Children's Clothing	☐ Coin-op Laundry
☐ Computer/Software	☐ Dentist
☐ Convenience Store	☐ Dry Cleaners
☐ Cosmetics, Beauty	☐ Fast Food Restaurant
☐ Family Clothing	☐ Fitness Center
☐ Florists	☐ Formal Wear/Costume
☐ Furniture	☐ Full Serv Restaurant
☐ General Merch (Dept)	☐ General Rental Center
☐ Gift and Souvenir	☐ Insurance
☐ Grocery	☐ Investments
☐ Health/Personal Care	☐ Lawyer
☐ Hobby/Toy/Game	☐ Mail/Copy Services
☐ Home Furnishings	☐ Movie Rental
☐ Jewelry	☐ Movie Theaters
☐ Men's Clothing	☐ Nail Salons
☐ Musical Instruments	☐ Night Club
☐ Office Supplies	☐ Optometrist
☐ Pet and Supplies	☐ Personal Care (Diet)
☐ Pharmacies and Drug	☐ Pet Care/Grooming
☐ Sewing, Needlework	☐ Photographic Services
☐ Shoe Store	☐ Physician
☐ Sporting Goods	☐ Tailor
☐ Tape, CD & Record	☐ Veterinary Services
☐ Women's Clothing	☐ Other_____
☐ Other_____	

27. Name up to three businesses you would like to see come to downtown Battle Mountain (i.e. specific name or chain).

a. _____

b. _____

c. _____

28. Which downtown buildings could be more productively used to create more economic activity for the district?

a. Location:_____

b. The space could be better used for:_____

_____

29. What types of housing would you like to see added to downtown? (Mark ALL that apply.)

☐ Senior units
☐ Condo units
☐ Loft/Studio units
☐ Rental apartments
☐ Single family homes
☐ Other_____

30. Do you have a Web site? ☐ Yes ☐ No

31. If yes, what is your average monthly web traffic measured in "unique visitors"? _____

32. If no, do you plan on launching one? ☐ Yes ☐ No

33. Do you sell products or services online? ☐ Yes ☐ No

34. If yes, what percent of your sales are online? _____

35. If no, do you plan to sell products or services online? ☐ Yes ☐ No

36. Do you communicate with your customers via e-mail? ☐ Yes ☐ No

37. What percentage of your annual marketing budget is spent with each of the following media? (Total = 100%)

____%	Newspapers	____%	Internet
____%	Magazines	____%	Give-aways & donations
____%	Radio	____%	Referral Programs
____%	Television	____%	Yellow Pages
____%	Direct Mail/Catalogs	____%	Other:_____(specify)
____%	Window Displays	____%	I don't advertise
____%	Billboards		

38. What media has produced the best results for you?

_____

_____

39. What percent of your sales is spent on marketing and media? _____%

40. Thinking regionally, how much do you compete with the following shopping destinations? (Mark one answer for each.)

	A Lot	A Little	Not at All	Don't Know
Elko	☐	☐	☐	☐
Winnemucca	☐	☐	☐	☐
Eureka	☐	☐	☐	☐
Carlin	☐	☐	☐	☐
Fallon	☐	☐	☐	☐
Reno/Sparks	☐	☐	☐	☐
Salt Lake City	☐	☐	☐	☐

41. What additional types of lodging accommodations are needed in Battle Mountain? (Mark ALL that apply.)

☐ Bed and breakfast or small inn
☐ Commercial chain hotel
☐ Other _____(specify)

Thank you for participating in this survey. Please return your survey no later than June 25. A postage-paid return envelope has been provided. Or you may return your survey to:

Professor Tom Harris
Resource Economics/204
University of Nevada, Reno
Reno, NV 89557-0204

APPENDIX B

BATTLE MOUNTAIN
CONSUMER QUESTIONNAIRE

Survey Materials

Survey Cover Letter

Dear Resident,

Battle Mountain has often been characterized as a "boom and bust" economy related to the activity of the regional mining industry. Because of a cyclical economy, commercial businesses have opened and closed in Battle Mountain. Project FIND is a local economic development project to investigate how to mitigate these cycles and to focus local economic development activities into a strong and vibrant local commercial sector. We need your thoughts and assistance in gathering local consumer data to focus our retail and commercial sector activities.

The enclosed survey allows you to tell us about your shopping behaviors and describe the types of businesses you might support if they were available in Battle Mountain. Your anonymous answers will be the cornerstone of a marketing plan designed to help expand existing and attract new businesses to Battle Mountain. It will take about 20 minutes to complete the survey. A postage-paid return envelope has been provided for you to mail back your survey.

- **Why should I fill out this survey?** To help us develop a plan to revitalize the Battle Mountain retail and commercial sector based on your shopping, service and dining needs.
- **Do I have to fill in all the questions?** The more information you provide the more accurate and useful our analysis will be. Completing the survey is voluntary and all information is confidential.
- **How is the Battle Mountain retail and commercial sector defined?** The retail and commercial sector of Battle Mountain is in the confines of the Battle Mountain city limits.
- **How do I return my survey?** Please mail it in the return envelope provided. No additional postage is required.

Please return your survey as soon as possible. While there is not a specific deadline, the sooner we receive your response, the sooner the information can be reported and made useful for the Battle Mountain community.

This project is a cooperative research effort sponsored by Project FIND (Future Industrial Need Discovery), Lander County Sustainable Development Committee, and funded by the Lander County Commissioners. The study is being conducted by the University Center for Economic Development, a part of the University of Nevada, Reno's Cooperative Extension and Resource Economics Department. We appreciate your time and look forward to your responses. Key findings will be reported to the public as soon as they are available via local media.

Thank you,

Thomas R. Harris
Professor and Director
University Center for Economic Development

Survey

The survey was mailed in a booklet format but appears here in letter format for ease of review.

Battle Mountain, Your Opinion Counts!

Project FIND
Battle Mountain Consumer Questionnaire

University of Nevada
Cooperative Extension

A cooperative research effort sponsored by
Project FIND (Future Industrial Need Discovery),
Lander County Sustainable Development Committee, and
funded by the Lander County Economic Development Authority

1. How often do you come to Battle Mountain for the following? (Mark ONE answer for each statement.)

	5 or More Times/Wk	2 to 4 Times/ Wk	Once a Week	Every Few Months	Never
Shopping, Non-Grocery	☐	☐	☐	☐	☐
Shopping, Grocery	☐	☐	☐	☐	☐
Eating Out	☐	☐	☐	☐	☐
Banking/Financial	☐	☐	☐	☐	☐
Health (i.e. Doctor, Dentist)	☐	☐	☐	☐	☐
Personal Care (i.e. Barber)	☐	☐	☐	☐	☐
Professional Services (i.e. Lawyer)	☐	☐	☐	☐	☐
Government/Post Office	☐	☐	☐	☐	☐
Entertainment (Casino)	☐	☐	☐	☐	☐
Other_____	☐	☐	☐	☐	☐

2. During which of the following days and times do you shop? (Mark all that apply.)

	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
8 a.m. to Noon	☐	☐	☐	☐	☐	☐	☐
Noon to 6 p.m.	☐	☐	☐	☐	☐	☐	☐
After 6 p.m.	☐	☐	☐	☐	☐	☐	☐

3. If downtown store hours were extended, which period would appeal to you most? (Mark all that apply.)

	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Early morning hours	☐	☐	☐	☐	☐	☐	☐
Evening hours	☐	☐	☐	☐	☐	☐	☐
Weekend days						☐	☐

4. When making purchases, what is most important to your decision? (Mark ONE reason for each type.)

	Selection	Service	Quality	Price	Hours	Ease	Other
Clothing	☐	☐	☐	☐	☐	☐	
Furniture/Appliances	☐	☐	☐	☐	☐	☐	
Gifts	☐	☐	☐	☐	☐	☐	
Groceries	☐	☐	☐	☐	☐	☐	

5. Indicate about how often you shop at the following locations. (Mark ONE for each business location.)

	More than Once per Week	Once per Week	Every 2 Weeks	Once a Month	Every 6 Months	Rarely
Battle Mountain	☐	☐	☐	☐	☐	☐
Austin	☐	☐	☐	☐	☐	☐
Elko	☐	☐	☐	☐	☐	☐
Winnemucca	☐	☐	☐	☐	☐	☐
Reno/Sparks	☐	☐	☐	☐	☐	☐
Salt Lake City	☐	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐	☐

6. What specific store(s) draw you to the other communities?

Elko_____

Winnemucca_____

Reno/Sparks_____

7. Which THREE businesses would you patronize if they opened in Battle Mountain? (Mark up to THREE.)

☐ Antiques	☐ Clothing-Vintage	☐ Hobby/Toy/Game
☐ Arcade/Kid's Entertainment	☐ Clothing-Women's	☐ Kitchen/Home
☐ Bakery	☐ Computer/Software	☐ Mailbox/Copy Center
☐ Books	☐ Dental Office	☐ Meats/Butcher Shop
☐ Bridal/Tux Rental	☐ Diet Center	☐ Pet and Pet Supply
☐ Camera Store	☐ Drug Store-Chain	☐ Photofinish/1 Hr Photo
☐ Child Care	☐ Gallery	☐ Physician Office
☐ Clothing-Family	☐ Gift/Souvenirs	☐ Sewing/Needlework
☐ Clothing-Men's	☐ Health Foods	☐ Shoe Store

☐ Other_____

8. Name two businesses you would like to see come to Battle Mountain (i.e. specific name or chain):

A._____

B._____

9. If you shop the following types of stores, please indicate if you primarily shop in the Battle Mountain area. If not, in dicate why you shop elsewhere. (Mark ONE reason for each store type.)

	I Shop in Battle Mountain	I Shop ELSEWHERE because of:							I Shop Online/ Catalogs
		Selection	Service	Quality	Price	Hours	Ease	Not Available in Battle Mountain	
Department/ Discount Stores	☐	☐	☐	☐	☐	☐	☐	☐	☐
Automotive Parts	☐	☐	☐	☐	☐	☐	☐	☐	☐
Furniture	☐	☐	☐	☐	☐	☐	☐	☐	☐
Home Furnishings	☐	☐	☐	☐	☐	☐	☐	☐	☐
Appliance/ Electronics	☐	☐	☐	☐	☐	☐	☐	☐	☐
Building Materials	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lawn and Garden	☐	☐	☐	☐	☐	☐	☐	☐	☐
Grocery	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pharmacy	☐	☐	☐	☐	☐	☐	☐	☐	☐
Cosmetics	☐	☐	☐	☐	☐	☐	☐	☐	☐
Optical Goods	☐	☐	☐	☐	☐	☐	☐	☐	☐
Health Food/ Other	☐	☐	☐	☐	☐	☐	☐	☐	☐
Women's Clothing	☐	☐	☐	☐	☐	☐	☐	☐	☐
Jewelry	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sporting Goods	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sewing/ Needlework	☐	☐	☐	☐	☐	☐	☐	☐	☐
Musical Instruments	☐	☐	☐	☐	☐	☐	☐	☐	☐
Books	☐	☐	☐	☐	☐	☐	☐	☐	☐
CD/Computer Games	☐	☐	☐	☐	☐	☐	☐	☐	☐
Florists	☐	☐	☐	☐	☐	☐	☐	☐	☐
Office Supplies	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gifts/Souvenirs	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pet and Pet Supplies	☐	☐	☐	☐	☐	☐	☐	☐	☐
Feed and Supply	☐	☐	☐	☐	☐	☐	☐	☐	☐

10. How often do you eat out? (Mark ONE answer for each meal.)

	5 or more times/week	2-4 times per week	Once a Week	Once a Month	Every few Months	Never
Breakfast	☐	☐	☐	☐	☐	☐
Lunch	☐	☐	☐	☐	☐	☐
Dinner	☐	☐	☐	☐	☐	☐

11. How often do you eat at the following types of restaurants? (Mark ONE answer for each dining option.)

	5 or more times/week	2-4 times per week	Once a Week	Once a Month	Every few Months	Never
Full Service-Fine Dining	☐	☐	☐	☐	☐	☐
Full Service-Casual	☐	☐	☐	☐	☐	☐
Fast Food/Drive Through	☐	☐	☐	☐	☐	☐

12. What two types of restaurants would you like to see in downtown Battle Mountain? (Mark TWO types.)

☐ Bakery
☐ Banquet Room
☐ Barbecue
☐ Brew Pub
☐ Chinese or Japanese
☐ Coffee Shop
☐ Delicatessen
☐ Family restaurant
☐ Fast food
☐ Italian
☐ Mexican
☐ Pancake
☐ Seafood
☐ Steakhouse
☐ Thai
☐ Vegetarian
☐ Late Night Eat/Drink
☐ Other_____
☐ Other_____
☐ None

13. What radio station do you listen to most? (Mark ONE.)

☐ KKOH 780
☐ KBOI 670
☐ KSL 1160
☐ KWNA FM 92.7
☐ Do Not Listen to Radio
☐ Other _____

14. What newspaper do you read most? (Mark ONE.)

☐ Battle Mountain Bugle
☐ Reno Gazette Journal
☐ Humboldt Sun
☐ Elko Free Press
☐ Do Not Read a Newspaper
☐ Other_____

15. In which leisure activities does your household participate? (Mark top THREE.)

☐ Acting/Drama	☐ Fishing	☐ Running
☐ Baseball/Softball	☐ Gardening	☐ Sewing/Quilting
☐ Basketball	☐ Golf	☐ Skiing-Cross Country
☐ Bicycling	☐ Hiking	☐ Skiing-Downhill
☐ Boating/Jet Skiing	☐ Horseback Riding	☐ Snowmobiling/ATV
☐ Bowling	☐ Hunting	☐ Swimming
☐ Camping	☐ Ice Skating	☐ Tennis
☐ Canoeing/Kayaking	☐ Motorcycling	☐ Traveling
☐ Collecting_____	☐ Music-Listening to	☐ Woodworking
☐ Computer/Internet	☐ Music-Band/Choir	☐ Other_____
☐ Cooking	☐ Painting/Drawing	☐ Other_____
☐ Crafts	☐ Photography	☐ Other_____
☐ Dancing	☐ Reading	☐ None of These

16. How strongly do you agree/disagree with the following statements? (Mark ONE for each statement.)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I always try to buy products and services locally	☐	☐	☐	☐	☐
I like the look and feel of Battle Mountain	☐	☐	☐	☐	☐
I prefer independent stores over chains	☐	☐	☐	☐	☐
Independent businesses should stay open past 5 p.m.	☐	☐	☐	☐	☐
More programs for youth should be offered	☐	☐	☐	☐	☐
Adult/Senior classes should be offered	☐	☐	☐	☐	☐
Adult/Senior recreation programs should be offered	☐	☐	☐	☐	☐

17. Why do you live in Battle Mountain? (Mark all that apply.)

☐ Community Spirit	☐ Low Housing Costs	☐ Town's Appearance
☐ Employment	☐ Public Services	☐ Weather
☐ Family Ties	☐ Recreational Opportunities	☐ Wide Open Spaces
☐ Friendly Atmosphere	☐ Schools	☐ Other_____
☐ Location	☐ Small Town	☐ Other_____

18. Name another small city that you feel has a vibrant and attractive downtown:

_____

19. Please provide any additional comments you feel would help us improve the Battle Mountain commercial sector:

_____

_____

_____

_____

Please Tell Us a Little About Yourself

What is your home zip code? _____ **How many live in your household?** _____

What is your age?	18 or under	18 to 24	25 to 44	45 to 64	65 and over	**Gender?**	Male	Female
	☐	☐	☐	☐	☐		☐	☐

How many children under 18 live in your household? _____

What is the highest level of formal education you have completed? (Mark ONE.)

☐ Grade 11 or Less	☐ Some College	☐ 4 Year College	☐ Post Graduate School
☐ High School	☐ Associate/Tech Degree	☐ Graduate School	

How would you describe your current job? (Mark ONE.)

☐ Admin. Support	☐ Looking for Work	☐ Professional	☐ Stay-at-Home
☐ Construction	☐ Mgmt/Financial	☐ Retired	☐ Student
☐ Farm/Forestry/Fishing	☐ Mining Related	☐ Sales	☐ Transportation
☐ Installation/Maint.	☐ Production	☐ Services	☐ Other _____

What is your household's gross annual income after taxes (optional)? (Mark ONE.)

☐ Under $15,000	☐ $35,000 to $49,999	☐ $100,000 to $149,999
☐ $15,000 to $24,999	☐ $50,000 to &74,999	☐ $150,000 to $199,999
☐ $25,000 to $34,999	☐ $75,000 to $99,999	☐ Over $200,000

Thank you for participating in this survey.

Your comments are appreciated:

Project FIND (Future Industrial Need Discovery) is a local economic development project investigating how to mitigate the "boom and bust" cycles of the Battle Mountain economy caused by the activity of the regional mining industry and how to focus local economic development activities into a strong and vibrant local commercial sector. Your thoughts and assistance in gathering local consumer data is much appreciated.

Please return your completed survey in the envelope provided or to:

University Center for Economic Development
Department of Resource Economics/204
University of Nevada, Reno
Reno, NV 895029-0204

If you have any questions concerning this survey, please contact:

Rod Davis
Extension Educator
University of Nevada Cooperative Extension
Battle Mountain Office
(775) 635-5565

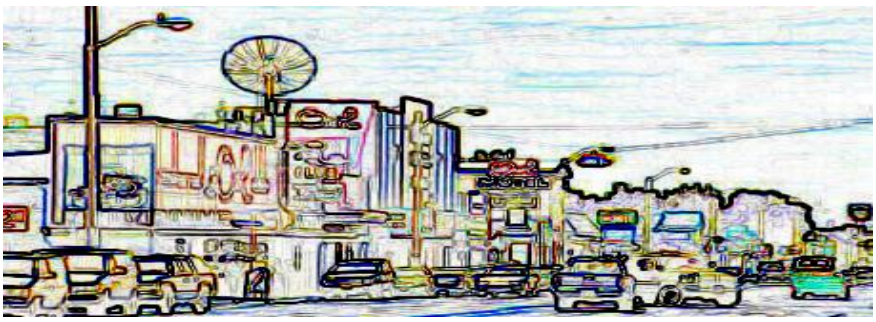
or

Tom Harris
Professor and Director
University Center for Economic Development
Department of Resource Economics/204
University of Nevada, Reno
(775) 784-1681

Reminder Postcard

Front:

Department of Resource Economics
University of Nevada, Reno/204
Reno, Nevada 89557-0204



«First Name» «Last Name» «Suffix»
«Address»
«City», «State» «Zip»

«ID Number»

Back:

Project FIND
Battle Mountain Consumer Questionnaire

A few weeks ago a questionnaire pertaining to consumer economic choices in Battle Mountain was mailed to you. If you have already completed the survey, please accept our sincere thanks. If not, please complete the questionnaire today. If you did not receive a questionnaire or have misplaced your copy, you can download a copy at:

http://www.unce.unr.edu/counties/lander

If you prefer, you may call or email us and we will have another questionnaire mailed to you immediately. To guard against duplicate or out-of-area responses a unique identifier has been provided. Responses are confidential - this number will not be used to associate your name to your responses in any way. Please record the following number on your submitted survey:

«Number»

Thank you very much for your time and cooperation.

Contact: Thomas R. Harris, Professor
Phone: (775) 784-1681
E-mail: harris@cabnr.unr.edu

APPENDIX C

DEMOGRAPHIC AND TRADE AREA INFORMATION

Appendix C, Demographic and Trade Area Information:

Appendix Table 1. Battle Mountain Trade Area Demographics.

Trade Area	Primary		Secondary		Tertiary	
	Number	Percent	Number	Percent	Number	Percent
Population (2010)	4,916		5,412		25,177	
Population (2015)	4,682		5,218		25,985	
Households (2010)						
Households	1,738		1,925		8,865	
Families	1,273		1,415		6,391	
Avg. Household Size	2.81		2.77		2.79	
Households (2015)						
Households	1,658		1,859		9,155	
Families	1,210		1,362		6,569	
Avg. Household Size	2.78		2.76		2.79	
Race (2010)						
White Alone	4,116	83.7%	4,521	83.5%	20,692	82.2%
Black Alone	5	0.1%	7	0.1%	211	0.8%
American Indian Alone	208	4.2%	222	4.1%	731	2.9%
Asian Alone	17	0.3%	20	0.4%	152	0.6%
Pacific Islander Alone	2	0.0%	2	0.0%	21	0.1%
Some Other Race Alone	442	9.0%	504	9.3%	2,486	9.9%
Two or More Races	126	2.6%	136	2.5%	884	3.5%
Race (2015)						
White Alone	3,916	83.6%	4,344	83.3%	20,953	80.6%
Black Alone	5	0.1%	7	0.1%	251	1.0%
American Indian Alone	197	4.2%	213	4.1%	786	3.0%
Asian Alone	17	0.4%	21	0.4%	167	0.6%
Pacific Islander Alone	2	0.0%	2	0.0%	23	0.1%
Some Other Race Alone	422	9.0%	496	9.5%	2,809	10.8%
Two or More Races	123	2.6%	135	2.6%	996	3.8%
Hispanic Origin, Any Race (2010)	965	19.6%	1,095	20.2%	5,542	22.0%
Hispanic Origin, Any Race (2015)	926	19.8%	1,083	20.8%	6,312	24.3%
Income (2010)						
Median Household Income	$ 47,537		$ 57,730		$ 58,138	
Average Household Income	$ 48,146		$ 59,755		$ 64,297	
Per Capita Income	$ 17,216		$ 21,678		$ 23,124	
Income (2015)						
Median Household Income	$ 62,859		$ 62,000		$ 62,621	
Average Household Income	$ 66,473		$ 66,419		$ 72,309	
Per Capita Income	$ 24,096		$ 24,162		$ 26,010	
Housing Units (2010)						
Owner-occupied	1,334		1,481		6,519	
Renter-occupied	404		444		2,346	
Housing Units (2015)						
Owner-occupied	1,270		1,427		6,726	
Renter-occupied	388		432		2,429	

Trade Area	Primary		Secondary		Tertiary	
	Number	Percent	Number	Percent	Number	Percent
Population by Age Group (2010)						
Age 0 - 4	398	8.1%	441	8.1%	2,049	8.1%
Age 5 - 9	405	8.2%	449	8.3%	2,030	8.1%
Age 10 - 14	374	7.6%	419	7.7%	1,983	7.9%
Age 15 - 19	407	8.3%	446	8.2%	1,884	7.5%
Age 20 - 24	337	6.9%	367	6.8%	1,552	6.2%
Age 25 - 34	646	13.1%	707	13.1%	3,242	12.9%
Age 35 - 44	605	12.3%	672	12.4%	3,440	13.7%
Age 45 - 54	689	14.0%	765	14.1%	3,811	15.1%
Age 55 - 64	626	12.7%	682	12.6%	2.960	11.8%
Age 65 - 74	290	5.9%	315	5.8%	1,420	5.6%
Age 75 - 84	98	2.0%	106	2.0%	591	2.3%
Age 85+	41	0.8%	43	0.8%	215	0.9%
Population by Age Group (2015)						
Age 0 - 4	377	8.1%	424	8.1%	2,086	8.0%
Age 5 - 9	387	8.3%	434	8.3%	2,082	8.0%
Age 10 - 14	381	7.1%	425	8.1%	2,125	8.2%
Age 15 - 19	311	6.6%	354	6.8%	1,814	7.0%
Age 20 - 24	324	6.9%	356	6.8%	1,561	6.0%
Age 25 - 34	730	15.6%	797	15.3%	3,648	14.0%
Age 35 - 44	532	11.4%	599	11.5%	3,248	12.5%
Age 45 - 54	535	11.4%	609	11.7%	3,432	13.2%
Age 55 - 64	597	12.8%	663	12.7%	3,286	12.6%
Age 65 - 74	357	7.6%	393	7.5%	1,789	6.9%
Age 75 - 84	113	2.4%	123	2.4%	690	2.7%
Age 85+	38	0.8%	41	0.8%	224	0.9%
Households by Income (2010)						
< $15,000	176	10.1%	190	9.9%	764	8.6%
$15,000 - $24,999	130	7.5%	144	7.5%	675	7.6%
$25,000 - $34,999	148	8.5%	170	8.8%	759	8.6%
$35,000 - $49,999	251	14.4%	282	14.6%	1,192	13.4%
$50,000 - $74,999	557	32.0%	632	32.8%	2,927	33.0%
$75,000 - $99,999	265	15.2%	278	14.4%	1,224	13.8%
$100,000 - $149,999	192	11.0%	205	10.6%	1,069	12.1%
$150,000 - $199,999	17	1.0%	18	0.9%	141	1.6%
$200,000+	2	0.1%	6	0.3%	114	1.3%
Households by Income (2015)						
< $15,000	127	7.7%	138	7.4%	572	6.2%
$15,000 - $24,999	100	6.0%	111	6.0%	542	5.9%
$25,000 - $34,999	117	7.1%	135	7.3%	628	6.9%
$35,000 - $49,999	186	11.2%	211	11.4%	908	9.9%
$50,000 - $74,999	565	34.1%	656	35.3%	3,231	35.3%
$75,000 - $99,999	265	16.0%	280	15.1%	1,298	14.2%
$100,000 - $149,999	270	16.3%	292	15.7%	1,588	17.3%
$150,000 - $199,999	26	1.6%	28	1.5%	237	2.6%

Trade Area	Primary		Secondary		Tertiary	
	Number	Percent	Number	Percent	Number	Percent
$200,000+	2	0.1%	8	0.4%	151	1.6%
Households by Disposable Income (2010)						
< $15,000	211	12.1%	228	11.8%	932	10.5%
$15,000 - $24,999	171	9.8%	193	10.0%	891	10.1%
$25,000 - $34,999	183	10.5%	209	10.9%	926	10.4%
$35,000 - $49,999	389	22.4%	439	22.8%	1,953	22.0%
$50,000 - $74,999	509	29.3%	559	29.0%	2,539	28.6%
$75,000 - $99,999	166	9.6%	176	9.1%	863	9.7%
$100,000 - $149,999	105	6.0%	112	5.8%	627	7.1%
$150,000 - $199,999	3	0.2%	5	0.3%	59	0.7%
$200,000 +	1	0.1%	4	0.2%	75	0.8%
Total	1,738		1,925		8,865	
Median Disposable Income	$45,645		$45,195		$47,175	
Average Disposable Income	$50,272		$50,468		$54,766	
Households by Net Worth (2010)						
< $15,000	453	26.1%	497	25.8%	2,049	23.1%
$15,000 - $34,999	143	8.2%	160	8.3%	791	8.9%
$35,000 - $49,999	108	6.2%	119	6.2%	535	6.0%
$50,000 - $74,999	195	11.2%	217	11.3%	884	10.0%
$75,000 - $99,999	109	6.3%	122	6.3%	599	6.8%
$100,000 - $149,999	169	9.7%	193	10.0%	939	10.6%
$150,000 - $249,999	250	14.4%	273	14.2%	1,237	14.0%
$250,000 - $499,999	211	12.1%	226	11.7%	1,017	11.5%
$500,000 - $999,999	81	4.7%	84	4.4%	458	5.2%
$1,000,000 +	19	1.1%	34	1.8%	356	4.0%
Total	1,738		1,925		8,865	
Median Net Worth	$70,058		$70,465		$81,189	

Source: ESRI Business Information Solutions, 2009 Estimates and Projections, www.esribis.com

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Appendix Table 2. Profile of Households by Type of Neighborhood Battle Mountain Trade Areas.

Trade Area	Primary 0-5 min		Secondary 5-15 min		Tertiary 15-30 min	
Households (2010)	**1,738**	**100.0%**	**1,925**	**100.0%**	**8,865**	**100.0%**
Group 1: High Society					**737**	**8.3%**
1A Top Rung						
1B Suburban Splendor						
1C Connoisseurs						
1D Boomburbs						
1E Wealthy Seaboard Suburbs						
1F Sophisticated Squires					737	8.3%
1G Exurbanites						
Group 2: Upscale Avenues					**268**	**3.0%**
2A Urban Chic						
2B Pleasant-Ville						
2C Pacific Heights						
2D In Style						
2E Enterprising Professionals						
2F Green Acres					268	3.0%
2G Cozy and Comfortable						
Group 3: Metropolis						
3A City Lights						
3B Metropolitans						
3C City Strivers						
3D Metro City Edge						
3E Urban Rows						
3F Modest Income Homes						
Group 4: Solo Acts						
4A Laptops and Lattes						
4B Trendsetters						
4C Metro Renters						
4D Old and Newcomers						
4E Young and Restless						
Group 5: Senior Styles						
5A Prosperous Empty Nesters						
5B Silver and Gold						
5C Rustbelt Retirees						
5D Retirement Communities						
5E The Elders						
5F Senior Sun Seekers						
5G Heartland Communities						
5H Simple Living						
5I Social Security Set						
Group 6: Scholars & Patriots						
6A Military Proximity						
6B College Towns						
6C Dorms to Diplomas						

Trade Area	Primary 0-5 min		Secondary 5-15 min		Tertiary 15-30 min	
Group 7: High Hopes					**718**	**8.1%**
7A Aspiring Young Families					420	4.7%
7B Great Expectations					298	3.4%
Group 8: Global Roots						
8A International Marketplace						
8B Industrious Urban Fringe						
8C Urban Melting Pot						
8D Las Casas						
8E Inner City Tenants						
8F NeWest Residents						
8G City Dimensions						
8H High Rise Renters						
Group 9: Family Portrait	**622**	**35.8%**	**622**	**32.3%**	**622**	**32.3%**
9A Up and Coming Families						
9B Milk and Cookies	622	35.8%	622	32.3%	622	32.3%
9C Urban Villages						
9D Southwestern Families						
9E City Commons						
Group 10: Traditional Living					**671**	**7.6%**
10A Main Street, USA					671	7.6%
10B Rustbelt Traditions						
10C Midlife Junction						
10D Family Foundations						
Group 11: Factories & Farms					**4**	**0.0%**
11A Salt of the Earth						
11B Prairie Living					4	0.0%
11C Southern Satellites						
11D Home Town						
11E Rural Bypasses						
Group 12: American Quilt	**1,116**	**64.2%**	**1,303**	**67.7%**	**5,845**	**65.9%**
12A Midland Crowd	452	26.0%	639	33.2%	3,787	42.7%
12B Rural Resort Dwellers					189	2.1%
12C Crossroads	664	38.2%	664	34.5%	1,869	21.1%
12D Rooted Rural						

Source: ESRI Business Information Solutions, 2009 Estimates and Projections, www.esribis.com

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Primary: Neighborhoods within 5 minutes drive of center

There are three neighborhood types that contain 1,738 households in the primary zone of the Battle Mountain trade area.

- 35.8 percent of the households live in neighborhoods that are:

  Consumer type 9B: Milk and Cookies
  Demographic: Upscale living on a family allowance, *Milk and Cookies* represents young, affluent married couples who are starting their families or already have young children. The median age of 33.7 years represents the presence of kids; nearly half of the households include children. One in four householders is between the ages of 45 and 54. The population diversity is comparable to that of the U.S., and the proportions of the population by race approximate the U.S. distributions with slightly above-average ratios of black and Hispanic residents.
  Socioeconomic: Ninety percent of *Milk and Cookies* households earn income from wages. The labor force participation rate of 71 percent is above average. The median household income is $64,527, and the median net worth is $135,891. Fifty-eight percent have attended college; more than 20 percent hold bachelor's or graduate degrees.
  Residential: *Milk and Cookies* residents prefer single-family homes in suburban neighborhoods of cities, largely in the South, particularly in Texas. Smaller concentrations of households are located in the West and Midwest. The median home value is $132,494. Housing units are generally 20–30 years old. Given the concentration of dual-income families, 71 percent of households have at least two vehicles. A family with two or more workers, more than one child, and two or more vehicles is the norm for these neighborhoods.
  Preferences: As *Milk and Cookies* residents settle into their family oriented lifestyle, they focus on family and the future. They are properly insured, carrying life and accidental death and dismemberment policies. They use a credit union, have overdraft protection, and usually have a new car loan. Although they may still own a motorcycle or small car, they prefer larger vehicles. When they move, they rent a U-Haul and move their own belongings. Many households own a dog. The presence of children in *Milk and Cookies* households drives their large purchases of baby and children's products including baby food, baby equipment, clothes, shoes, medicine, vitamins, board games, bicycles, toys, video games, and children's DVDs. Most households own one of the latest video game systems and a large-screen TV. To save time in their busy lives, they frequently buy prepared dinners from the grocery store and fast food. They play video games, go bowling, and visit theme parks such as Six Flags and Sea World. They watch professional football and basketball games. Favorite cable channels include Cartoon Network, Discovery Channel, National Geographic Channel, and BET. They also work on their lawns, tackle interior painting projects, or do minor maintenance on their vehicles.

- 26.0 percent of the households live in neighborhoods that are:

  Consumer Type 12A: Midland Crowd
  Demographic: The growing population of 12 million, approximately 4 percent of the U.S. population, identifies Midland Crowd as Tapestry's largest segment. Since 2000, the population has grown by 2.4 percent annually. The median age of 37 years parallels that of the U.S. median. Sixty-two percent of the households are married couple families; half of them have children. Twenty percent of the households are singles who live alone. Midland Crowd neighborhoods are not diverse.

Socioeconomic: Median household income is $50,518, slightly lower than the U.S. median. Most income is earned from wages and salaries; however, self-employment ventures are slightly higher for this segment than the national average. The median net worth is $89,749. Unemployment is below average. Half of the residents who work hold white collar jobs. More than 45 percent of the residents aged 25 years and older have attended college; 16 percent have earned a bachelor's or graduate degree.
Residential: Midland Crowd residents live in housing developments in rural villages and towns throughout the U.S., mainly in the South. Three-fourths of the housing was built after 1969. The homeownership rate is 82 percent, higher than the national rate of 66 percent. The median home value is $124,088. Two-thirds of the housing is single-family houses; 28 percent are mobile homes.
Preferences: These politically active, conservative residents vote, work for their candidates, and serve on local committees. Their rural location and traditional lifestyle dictate their product preferences. A fourth of the households own three or more vehicles; they typically own or lease a truck, and many own a motorcycle. Proficient do-it-yourselfers, they work on their vehicles, homes, and gardens and keep everything in tip-top shape. They hunt, fish, and do woodworking. Dogs are their favorite pets. They patronize local stores or shop by mail order. They have recently bought radial tires. They often go to the drive-through at a fast-food restaurant. Many households own a satellite dish so they can watch CMT, the Speed Channel, Home & Garden Television, NASCAR racing, rodeo/bull riding, truck and tractor pulls, fishing programs, and a variety of news programs. They listen to country music on the radio and read fishing and hunting magazines.

- 38.2 percent of the households live in neighborhoods that are:

Consumer Type 12C: Crossroads
Demographic: Crossroads neighborhoods are growing communities in small towns in the South, Midwest, and West. Married couples with and without children and single parents are the primary household types in these areas. Younger than the U.S. average, they have a median age of 32.1 years; nearly half are younger than 45. This population is growing at 1.6 percent annually, faster than the growth of the U.S. population. One in five is Hispanic, a higher proportion than the U.S.
Socioeconomic: The median household income is $44,410, somewhat below the U.S. median; the median net worth is $53,300. Educational attainment is lower than the U.S. average; 37 percent of residents aged 25 years or older have attended college, compared to 54 percent for the U.S. Most employed residents work in the manufacturing, retail, construction, and service industries. Labor force participation is comparable to the U.S. level; unemployment is slightly higher.
Residential: Affordable housing in these small-town communities provides opportunities for young families to own their homes. Homeownership is 74 percent; the median home value is $62,469, much lower than the U.S. median. More than half of the housing is mobile homes; 36 percent are single-family dwellings. Most were built after 1969.
Preferences: Mindful of their expenses, Crossroads households budget for what they buy and choose selectively where to spend their money. They shop at discount department stores such as Wal-Mart and Kmart. Many shop for groceries at Wal-Mart Supercenters. Their priorities are their families and their cars. Children are the focus of their lives, and they buy children's products in addition to groceries. They drive domestic cars and trucks and handle the maintenance themselves. Investing and saving for retirement are a low priority; many households do not own mutual funds, stocks, or retirement savings accounts. Home improvement projects also rank low. They watch NASCAR racing and other sports on TV. Typically, they own a satellite dish or subscribe to cable. They also like to listen to the radio, preferring country and contemporary hit music to other formats. They read the newspaper less frequently than average U.S. households; however, they read

magazines, especially automotive, boating, motorcycle, and fishing publications. They go fishing and watch movies on DVD.

Secondary: Neighborhoods between 5 and 15 minutes drive of center

The secondary trade area of Battle Mountain is comprised of 1,925 households.

- 32.3 percent of the households live in neighborhoods that are:

  Consumer type 9B: Milk and Cookies
  See description above.

- 33.2 percent of the households live in neighborhoods that are:

  Consumer type 12A: Midland Crowd
  See description above.

- 34.5 percent of the households live in neighborhoods that are:

  Consumer type 12C: Crossroads
  See description above.

Tertiary: Neighborhoods between 15 and 30 minutes drive of center

The tertiary trade area of Battle Mountain is comprised of 8,865 households.

- 8.3 percent of the households live in neighborhoods that are:

  Consumer type 1F: Sophisticated Squires
  Demographic: Residents of Sophisticated Squires neighborhoods enjoy cultured country life on the urban fringe. These city escapees accept longer commutes to live near fewer neighbors. Mostly married couple families; more than 40 percent of the households are married couples with children that range from toddlers to young adults. The median age is 38.2 years. Most are baby boomers and are aged between 35 and 54 years. This segment is not ethnically diverse; most residents are white.
  Socioeconomic: These residents are educated; more than one-third of the population aged 25 years or older holds a bachelor's or graduate degree; another third has attended college. Labor force participation rates are high; occupations range from management to unskilled labor positions. Most work in white-collar jobs. The median household income is $86,075. Nearly 90 percent of the households earn wage or salary income; nearly half supplement their wages and salaries with interest, dividends, or rental income. The median net worth is $298,660.
  Residential: Sophisticated Squires live in less densely populated areas concentrated along the Atlantic coast and around the Great Lakes. Approximately 90 percent of the housing is single-family homes; the median home value is $237,607. Seventy-four percent of the housing was built before 1990; 55 percent was built between 1970 and 1989. More than 80 percent of the households own at least two vehicles. They prefer compact SUVs; however, many drive minivans or full-size SUVs.
  Preferences: Do-it-yourselfers, Sophisticated Squires residents take care of their lawns and landscaping; home improvements; and remodeling projects such as bathroom remodeling, installing

new light fixtures, painting home interiors, staining decks, and cleaning carpets with their steam cleaners. They like to barbecue on their gas grills and make bread with their bread making machines. Many households own a motorcycle. A typical household will own three or more cell phones. Looking toward the future, many residents own stocks, bonds, and large life insurance policies. When dieting, they go on Weight Watchers; many own a treadmill or stationary bike to stay fit. They go power boating, play board and word games, do woodworking projects, and attend football and baseball games. Adults also take photos, play golf, and ride their motorcycles. Children play games on the home personal computer and typically own a video game system. Residents listen to soft adult contemporary music; classic hits; news; all-talk; and sports radio, including broadcasts of professional games. Although many households have four or more TVs, residents watch as much television as typical U.S. households. Favorite programs include news, comedies, dramas, and programs on Home & Garden Television.

- 3.0 percent of the households live in neighborhoods that are:

Consumer type 2F: Green Acres

Demographic: Seventy-one percent of the households in *Green Acres* neighborhoods are married couples with and without children. Many families are blue-collar Baby Boomers, many with children aged 6–17 years. With more than 10 million people, *Green Acres* represents Tapestry's third largest segment, currently more than 3 percent of the U.S. population and growing by 2.2 percent annually. The median age is 40.7 years. This segment is not ethnically diverse; 92 percent of the residents are white.

Socioeconomic: Educated and hard-working, more than one-fourth of *Green Acres* residents hold a bachelor's or graduate degree; more than half have attended college. Labor force participation is 68 percent, with higher employment concentrations in the manufacturing, construction, healthcare, and retail trade industry sectors. Occupation distributions are similar to those of the U.S. Seventeen percent of the households earn income from self-employment ventures. The median household income is $64,480; the median net worth is $177,629.

Residential: Although *Green Acres* neighborhoods are located throughout the country, they are found primarily in the Midwest and South, with the highest concentrations in Michigan, Ohio, and Pennsylvania. A "little bit country," these residents live in pastoral settings of developing suburban fringe areas. Homeownership is at 86 percent, and median home value is $181,705. Typical of rural residents, *Green Acres* households own multiple vehicles; 78 percent own two or more vehicles.

Preferences: Country living describes the lifestyle of *Green Acres* residents. Pet dogs or cats are considered part of the family. These do-it-yourselfers maintain and remodel their homes; projects include roofing and installing carpet or insulation. They own all the necessary power tools, including routers, welders, sanders, and various saws, to finish their projects. Residents also have the right tools to maintain their lawns, flower gardens, and vegetable gardens. They own riding lawn mowers, garden tillers, tractors, and even separate home freezers for the harvest. Continuing the do-it-yourself mode, it is not surprising that *Green Acres* is the top market for owning a sewing machine. A favorite pastime is using their ice cream maker to produce homemade ice cream. They prefer motorcycles and full-size pickup trucks. For exercise, *Green Acres* residents ride their mountain bikes and go fishing, canoeing, and kayaking. They also ride horses and go power boating, bird watching, target shooting, hunting, motorcycling, and bowling. They listen to auto racing and country music on the radio and read fishing and hunting magazines. Many own satellite dishes so they can watch news programs, the Speed Channel, and auto racing on TV. A favorite channel is Country Music Television.

- 4.7 percent of the households live in neighborhoods that are:

  Consumer type 7A: Aspiring Young Families
  Demographic: Most of the residents in these neighborhoods are young, startup families, married couples with or without children, and single parents. The average family size of 3.1 people matches the U.S. average. Approximately two-thirds of the households are families, 27 percent are single person, and 9 percent are shared. Annual population growth is 1.3 percent, higher than the U.S. figure. The median age is 30.4 years; nearly 20 percent of the residents are in their 20s. Typical of younger populations, Aspiring Young Families residents are more ethnically diverse than the total U.S. population.
  Socioeconomic: The median household income is $52,036; wages provide the primary source of income. The median net worth is $37,712. Approximately 60 percent of employed residents work in professional, management, sales, or office/administrative support positions. Overall, 87 percent of residents aged 25 years and older have graduated from high school, 58 percent have attended college, and 24 percent hold a bachelor's or graduate degree.
  Residential: In large, growing southern and western metropolitan areas, the highest concentrations of these neighborhoods are found in California, Florida, and Texas. Twenty percent are located in the Midwest. Tenure is nearly even; 51 percent of the households rent; 49 percent own their homes. Residents live in moderately priced apartments, single-family houses, and startup townhouses. Most of the housing was built after 1969. The average gross rent is comparable to the U.S. average. The median home value is $141,309.
  Preferences: Focused on family and home, residents of Aspiring Young Families communities spend most of their discretionary income for baby and children's products, toys, home furnishings, cameras, and video game systems. They go online to look for jobs, play games, and buy personal preference items such as music and computer equipment. These residents would probably go to a theme park while on vacation. They play video games, watch TV, eat out, and go to the movies. They also play basketball and go bowling and biking. They listen to urban stations and professional basketball games on the radio and watch sports, news, entertainment, and courtroom shows on TV. They eat out at family restaurants such as Chili's or IHOP and go to Jack in the Box or Sonic for fast food.

- 3.4 percent of the households live in neighborhoods that are:

  Consumer type 7B: Great Expectations
  Demographic: Young singles who live alone and married-couple families dominate the Great Expectations market, although all household types are represented. The median age is 33.2 years. Some residents are just beginning their careers or family lives. Compared to the U.S. figures, this segment has a higher proportion of residents who are in their 20s and a higher proportion of householders younger than 35 years. The ethnic diversity and racial composition of this segment are similar to U.S. levels.
  Socioeconomic: The median household income of $38,790 and the median net worth of $20,643 are lower than the U.S. values. Nearly half of the population aged 25 years and older has some postsecondary education; 18 percent hold a bachelor's or graduate degree. Labor force participation rate is 68 percent; most of the jobs come from the manufacturing, retail, and service industry sectors.
  Residential: Great Expectations neighborhoods are located throughout the country, with higher proportions in the Midwest and South. Half own their homes; half rent. More than half of the households are single-family dwellings; approximately 40 percent are apartments in low- or mid-rise

buildings. The median home value is $102,241. Most of the housing units in these older suburban neighborhoods were built before 1960.
Preferences: Great Expectations homeowners are not afraid to tackle smaller maintenance and remodeling projects, but they also enjoy a young and active lifestyle. They go out to dinner and to the movies. They do most of their grocery shopping at Walmart Supercenters, Aldi, and Shop 'n Save. They throw Frisbees; play softball and pool; go canoeing; watch horror, science fiction, and drama films on DVD; and listen to country music, classic rock, and sports on the radio. They watch dramas, auto racing, and the evening news on TV. They occasionally eat at Arby's and Dairy Queen. They shop at major discount and department stores. They rarely travel. Focused on starting their careers, they're not investing for their retirement years.

- 32.2 percent of the households live in neighborhoods that are:

Consumer type 9B: Milk and Cookies
See description above.

- 7.6 percent of the households live in neighborhoods that are:

Consumer type 10A: Main Street, USA
Demographic: *Main Street, USA* neighborhoods are a mix of household types, similar to the U.S. distribution. Approximately half of the households are composed of married-couple families, nearly one-third are single-person or shared households, and the rest are single-parent or other family households. The median age of 36.7 years matches the U.S. median. These residents are less diverse than the U.S. population.
Socioeconomic: The median household income is $57,082, derived from wages, interest, dividends, or rental property. Their median net worth is $86,618. More than one in five residents aged 25 years and older hold a bachelor's or graduate degree; half of the residents have attended college. Occupation and industry distributions are similar to those of the U.S.
Residential: A mix of single-family homes and multiunit buildings, these neighborhoods are located in the suburbs of smaller cities in the Northeast, West, and Midwest. Nearly two-thirds of the housing was built before 1970. The homeownership rate is 63; the median home value is $181,600.
Preferences: Family-oriented and frugal, these residents may occasionally go to the movies or eat out at a family restaurant, such as Friendly's or Red Robin, but are most likely to stay home and watch a rental movie or play games with their children. They own pet cats. They play baseball and basketball and go swimming. They listen to classic hits and rock radio and watch cartoons and courtroom shows on TV. They go to the beach and theme parks or take domestic vacations to visit with family or see national parks. They go online periodically to look for jobs, research real estate, and play games and are beginning to shop online. Those who do not have Internet access at home will go online at school or the public library. They use the Yellow Pages to find veterinarians or stores. They will invest in small home improvement and remodeling projects, usually doing the work themselves instead of hiring a contractor. They buy the tools and supplies for these projects from Home Depot or Ace Hardware. They keep up their lawns and gardens by planting bulbs, fertilizing, and applying lawn care products regularly.

- 0.0 percent of the households live in neighborhoods that are:

Consumer type 11C: Southern Satellites
Demographic: Found primarily in the rural South, Southern Satellites households consist of married

couples with and without children; 22 percent are singles. The median age of 38.1 years is near the U.S. median of 36.9. This segment has low diversity; 87 percent of the residents are white.
Socioeconomic: The median household income is $39,969; the median net worth is $52,475. Sixty percent participate in the labor force, slightly below the U.S. percentage. Most households earn income from wages and salaries; 28 percent receive Social Security benefits. The manufacturing and service industry sectors provide most of their jobs. Educational attainment is lower than the national level; 16 percent of residents aged 25 years and older have not graduated from high school.
Residential: Eighty percent of these households are in the South. Primary housing types in these neighborhoods are newer single-family dwellings for two-thirds of the households; 30 percent live in mobile homes. The homeownership rate is 81 percent; the median home value is $87,166. Nearly two-thirds of the housing was built after 1969. Vacancy rates are slightly above average.
Preferences: These rural residents enjoy country life. Fishing and hunting are two favorite leisure activities, and Southern Satellites residents spend money for magazines, clothes, and gear related to these interests. Because cable is not always available, many residents own satellite dishes. Many own pets. They work in their vegetable gardens and might own equipment such as riding mowers and tillers to help with outdoor chores. Most households have two or more vehicles to meet their transportation needs; they prefer domestic cars, and many drive trucks. They consider themselves to be politically conservative. They read newspapers and magazines infrequently; however, they listen to country radio and watch fishing programs, NASCAR racing, and country music programs on TV. Owning personal computers and going online from home isn't important to these residents.

- 42.7 percent of the households live in neighborhoods that are:

Consumer type 12A: Midland Crowd
See description above.

- 2.1 percent of the households live in neighborhoods that are:

Consumer type 12B: Rural Resort Dwellers
Demographic: These neighborhoods are found in pastoral settings in rural nonfarm areas throughout the U.S. Household types include empty-nester married couples, singles, and married couples with children. The median age is 47.2 years; more than half are aged 55 and older. Most residents are white in these low diversity neighborhoods.
Socioeconomic: Although retirement beckons, most of these residents still work. The median household income is $48,105, slightly below the U.S. level. Six percent of those who are employed work at home, twice the U.S. rate. Because so many residents are aged 65 and older, receipt of retirement income and Social Security benefits is common. More than two-fifths collect investment income; approximately 20 percent receive self-employment income. Nearly one in four residents aged 25 years and older holds a bachelor's or graduate degree; half of the residents have attended college. The median net worth is $111,790, slightly below the U.S. median.
Residential: The number of households in these small, low-density neighborhoods is growing at 2.1 percent annually. Seventy-eight percent of the housing is single-family structures; 15 percent is mobile homes. Homeownership is at 81 percent; the median home value is $189,032. Of the Tapestry segments, *Rural Resort Dwellers* has the highest percentage of seasonal housing, 16 times higher than the national level.
Preferences: These residents live modestly and have simple tastes. They often work on home improvement and remodeling projects and own garden equipment to maintain their yards. They cook and bake at home. Many households own multiple pets, particularly dogs and cats. Riding

lawn mowers and satellite dishes are familiar sights in these areas, along with multiple vehicles, including a truck. Active participants in local civic issues, residents also belong to environmental groups, church and charitable organizations, fraternal orders, unions, and veterans' clubs. They go hiking, boating, canoeing, hunting, fishing, horseback riding, and golfing. They listen to country radio and watch Animal Planet, CMT, BBC America, the National Geographic Channel, and primetime dramas on TV. The older residents focus on their general health care, prescription medications, and financial and retirement-related matters. Many residents actively manage or plan their investments and retirement savings. The self-employed residents are more likely to have IRAs than 401(k) plans.

- 21.1 percent of the households live in neighborhoods that are:

  Consumer type 12C: Crossroads
  See description above.

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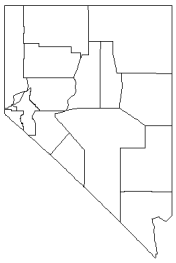
A Housing Gap Analysis for Lander County



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Project sponsored and funded by the Nevada Committee on Economic Development.

University of Nevada, Reno
Center for Economic Development

Nevada Small Business Development Center
Geographic Information Services

A Housing Gap Analysis for Lander County

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July 2008

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This publication, *A Housing Gap Analysis for Lander County*, was published by the University of Nevada Economic Development Center and Nevada Small Business Development Center. Funds for the publication were provided by the Lander County Commissioners and the United States Department of Commerce Economic Development Administration under University Centers Program contract #07-66-05878-02. This publication's statements, findings, conclusions, recommendations, and/or data represent solely the findings and views of the author and do not necessarily represent the views of the Lander County Commissioners, United States Department of Commerce, Economic Development Administration, United States Small Business Administration, University of Nevada, or any reference sources used or quoted by this study. Reference to research projects, programs, books, magazines, or newspaper articles does not imply an endorsement or recommendation by the author unless otherwise stated. Correspondence regarding this document should be sent to:

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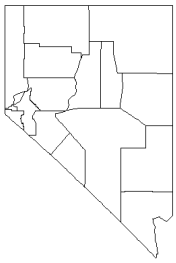

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A Housing Gap Analysis for Lander County

Executive Summary

Lander County is located in the northeastern part of the state. It is bordered by Humboldt County to the northwest, Elko County to the north, Eureka County to the east, Nye County to the south and Churchill and Pershing Counties to the west. The community of Battle Mountain is the county seat and population center. The town of Austin is located in southern Lander County. The economy of Lander County is based on mining, with cyclical production cycles that influence overall county economic activity and local housing demand and stock. Below are highlights from the Lander County housing gap study.

- A "gap analysis" is the difference between the current housing stock and projected housing demand in Lander County.
- Approximately 19 percent of housing stock in Lander County was built before 1970. For comparison, 18 percent of the state of Nevada's housing stock and 49 percent of the nation's housing stock was built before 1970.
- From 1970 to 1990, 60 percent of Lander County's housing stock was built as compared to 40 percent and 39 percent for the state of Nevada and the nation, respectively.
- The age of Lander County's housing stock will impact economic development and diversification efforts.
- From 1970 to 2007, Lander County's average population growth was estimated to be 2.11 percent, which ranks Lander County thirteenth among Nevada's seventeen counties.
- Also from 1970 to 2007, Lander County had the fifth largest variability in population growth rates of any county in the state of Nevada.
- The low growth rate and high variability in population growth has inhibited housing development in Lander County.
- However, with recent developments in the local mining industry, Lander County has realized a population increase over the past two years.
- Unemployment in Lander County was 3.6 percent in 2007 which was less than the state unemployment average of 4.8 percent and the national unemployment rate of 4.6 percent.

- Employment and entrepreneurial tends in Lander County have been increasing lately with the increased mineral industry activity.
- Housing supply or stock in Lander County is old in comparison to the state and nation.
- The trend in building new, single-family, detached housing and mobile homes in Lander County has declined from 1970 to 2007. This decrease in home and mobile home building will impact housing stock availability.
- Housing demand in Lander County will be tied to forecasts of employment growth or decline. If employment grew at 1.9 percent annually, employment in Lander County would be estimated to be 2,802
- For this analysis, four scenarios of the housing gap spreadsheet are presented.
- For the first scenario, it is assumed all persons working in Lander County will live in Lander County. This can be seen as an optimistic scenario.
- Using factors for population per employee, a place-of-work capture factor of 1.0, vacancy rates, and the number of uninhabitable house as 129 homes, Lander County is projected to have a housing deficit of 871 housing units. Housing units are an aggregate value of single-family housing, condominiums, multi-family units, and mobile homes.
- If all Lander County homes built before 1970 are assumed uninhabitable, the housing deficit grows to 1,269 housing units.
- For the second scenario, it is assumed that 80 percent of Lander County employment will be captured with no employment vacancy and 527 homes uninhabited. Under these assumptions the housing gap is 372 housing units.
- For the third scenario, the factors used for this scenario are similar to scenario one. Under the third scenario, full capture of employees in Lander County is assumed. Also, housing units are disaggregated by single-family, condominiums, multi-family and mobile homes.
- If demand for housing units follows the proportionate share as in 222, it is estimated that Lander County housing shortage would be 298 detached single-housing, 12 condominiums, 35 multi-family housing and 526 mobile homes.
- For the fourth scenario, factors used in scenario two are used where it is assumed that 80 percent of Lander County employment will live in Lander County. Under this scenario, the estimated housing gap for Lander County is 128 detached single-family homes, five condominiums, 16 multi-family houses and 222 mobile homes.
- Using alternative factors and housing proportionate demand, alternative analysis for housing gap can be estimated.
- Using Housing and Urban Development procedures, the 2000 Census family income in Lander County indicates 1,027 families or 65.4 percent of all Lander County families could qualify for a single-family home. For manufactured housing, 1,085 families or 69.1 percent of Lander County families would qualify for a mortgage.

- Adequate and affordable housing is essential for supporting economic development and diversification in Lander County. A result of the study is that the age of the Lander County housing stock and housing affordability need to be addressed in order to enhance future county economic development and diversification efforts.

Introduction

"Adequate housing is essential in supporting economic growth. To attract new businesses or industry, a community should be able to house new workers moving into the community" (Daniel et al., 1995).

The issue of sufficient housing affects many rural communities in Lander County. For many communities, it is more than an issue of providing shelter; it is an economic development concern. Local leaders often feel they must provide enough housing to have a quality labor pool to support economic development in the county. Housing is one of the greatest challenges facing rural Nevada communities today. In most Nevada rural communities, the housing market is tight and the housing stock is aging. For example, according to the 2000 Census, approximately 60 percent of the housing stock in Lander County was built between 1970 and 1990 (Table 1). For comparison from the 2000 Census, 40 percent of the state of Nevada's and 34 percent of the nation's housing stock was built between 1970 and 1990. For Lander County, 571 homes were built between 1990 and 2000, which makes up approximately 20.5 percent of Lander County's housing stock. In comparison, approximately 42.1 percent and 17.0 percent of state of Nevada and national housing stock, respectively, was built between 1990 and 2000. The housing expansion in urban Clark and Washoe counties heavily influenced these state values.

Table 1. Years Structures Built; U.S., State of Nevada and Lander County.

Years Built	United States		Nevada		Lander County	
	Count	%	Count	%	Count	%
1999 to March 2000	2,755,075	2.4	39,025	5.20	9	0.3
1995 to 1998	8,478,975	7.3	152,578	20.31	329	11.8
1990 to 1994	8,467,008	7.3	124,635	16.59	233	8.4
1980 to 1989	18,326,847	15.8	157,516	20.97	812	29.2
1970 to 1979	21,438,863	18.5	145,920	19.43	870	31.3
1960 to 1969	15,911,903	13.7	71,646	9.54	277	10.0
1940 to 1959	23,145,917	20.0	47,712	6.36	155	5.6
1939 or earlier	17,380,053	15.0	12,131	1.61	95	3.4

Source: Census 2000 summary File 3 (SF3) – Sample Data.

Some believe the lack of housing limits economic growth. For current and future economic growth in Lander County, improving the quality and quantity of housing stock in Lander County and the city of Battle Mountain would greatly enhance current and future economic development opportunities in Lander County and the city of Battle Mountain.

Therefore, the primary objective of this paper is to complete a housing gap analysis for Lander County. The term "gap analysis" means the difference between the current housing stock and projected demand in Lander County. In order to meet this objective, this paper is divided into five sections. The first section of this paper investigates population trends in Lander County, the state of Nevada, and the nation. The second section discusses labor trends in Lander County, the state of Nevada, and the nation. The third section discusses housing supply in Lander County. The fourth section estimates housing demand in Lander County. The final section completes a "gap analysis" for housing in Lander County.

Population Trends

Lander County is located in the northeastern part of the state. Lander County is bordered by Humboldt County to the northwest, Elko County to the north, Eureka County to the east, Nye County to the south and Churchill and Pershing Counties to the west. Population and rates of population growth provide vital information to federal, state and local government employees, as well as to the private sector regarding areas of economic growth. Population estimates provide information used under several programs to allocate federal and state funds and sales taxes to counties and to allocate justices of the peace for townships. In addition, population estimates are used to determine various vital statistics, such as poverty, mortality, fertility, per capita income and others for use in official grant requests. Population trends and analysis are essential to complete a housing gap analysis for Lander County.

Census Population Trends

Every ten years, the U.S. Bureau of Census conducts a population census of the United States. Information from the 2000 Census may be helpful to Lander County decision makers.

Table 2 shows the 2000 and 1990 county populations, population rankings and changes in ranking for Nevada's 17 counties. Population for Lander County decreased from 9,264 in 1990 to 9,181 in 2000. Lander County maintained its population rank as twelfth among Nevada's 17 counties in 1990 and 2000.

Table 2. County Population, Rank of Population and Change in Population Rank, State of Nevada, 1990 to 2000.

County	2000		1990		Change in Rank
	Population	Rank	Population	Rank	
Clark	1,375,765	1	741,459	1	0
Washoe	339,486	2	254,667	2	0
Carson City	52,457	3	40,443	3	0
Elko	45,291	4	33,530	4	0
Douglas	41,259	5	27,637	5	0
Lyon	34,501	6	20,001	6	0
Nye	32,485	7	17,781	8	1
Churchill	23,982	8	17,938	7	-1
Humboldt	16,106	9	12,844	9	0
White Pine	9,181	10	9,264	10	0
Pershing	6,693	11	4,334	13	2
Lander	**5,794**	**12**	**6,266**	**12**	**0**
Mineral	5,071	13	6,475	11	-2
Lincoln	4,165	14	3,775	14	0
Storey	3,399	15	2,526	15	0
Eureka	1,651	16	1,547	16	0
Esmeralda	971	17	1,344	17	0
Urban [1]	1,767,708		1,036,569		
Rural [2]	230,549		165,262		
TOTAL	1,998,257		1,201,831		

Source: U.S. Department of Commerce. "Census 2000 Redistricting Data (PL-94-171) Summary File, Table PL1 and 1990 Census." Bureau of Census: Washington D.C. 2000 and 1990.
[1] Urban counties of Nevada are Carson City, Clark and Washoe Counties.
[2] Rural counties are the remaining fourteen of Nevada's 17 counties.

Of interest is the growth of Nevada's urban counties (Carson City, Clark and Washoe) growing from 1,036,569 in 1990 to 1,767,708 in 2000. The rural counties of Nevada have also realized population growth, increasing from 165,262 in 1990 to 230,549 in 2000. However, even with the rural Nevada population increase, the proportionate urban share of Nevada's population increased from 86.25 percent in 1990 to 88.46 percent in 2000.

Table 3 details population growth, county population growth rates and county proportionate share of total state of Nevada population growth from 1990 to 2000. Lander County realized a population decrease of 472 people from 1990 to 2000, which ranked the county sixteenth among Nevada's 17 counties in population growth from 1990 to 2000. This is a 7.53 percent decrease in county census population from 1990 to 2000. Lander County contributed -0.06 percent to total state population growth.

Even though rural Nevada realized a 39.50 percent growth rate in population from 1990 to 2000, this growth was less than the urban Nevada counties. As seen in Table 3, the state of

Nevada realized a growth rate of 66.27 percent from 1990 to 2000, which was the largest of any state in the nation. However, this growth was not evenly distributed throughout the state. In fact, four of Nevada's 17 counties realized population decreases during the state's rapid population increase. Unfortunately, two of these counties, Lander and White Pine are located in northeast Nevada.

From Table 3, Clark County had the largest population growth with 634,306 people, which is a county population growth rate of 85.55 percent. Also, Clark County accounted for approximately 80 percent of the state's total population growth. Nevada's three urban counties, Carson City, Clark and Washoe, realized a population growth of approximately 71 percent from 1990 to 2000. This indicates that the urban counties of Nevada, especially Clark County, will gain in political strength during the next decade.

Table 3. Change in County Population, Percentage Change in County Population and Percentage of State Change in Population by County, State of Nevada, 1990 to 2000.

	Population Change from 1990 to 2000			
County	**Number**	**Rank**	**Percentage**	**Percentage of State Change**
Clark	634,306	1	85.55	79.64
Washoe	84,819	2	33.31	10.65
Nye	14,704	3	82.70	1.85
Lyon	14,500	4	72.50	1.82
Douglas	13,622	5	49.29	1.71
Carson City	12,014	6	29.71	1.51
Elko	11,761	7	35.08	1.48
Churchill	6,044	8	33.69	0.76
Humboldt	3,262	9	25.40	0.41
Pershing	2,357	10	54.36	0.30
Storey	873	11	34.56	0.11
Lincoln	390	12	10.33	0.05
Eureka	104	13	6.72	0.01
White Pine	-83	14	-0.90	-0.01
Esmeralda	-373	15	-27.75	-0.05
Lander	**-472**	**16**	**-7.53**	**-0.06**
Mineral	-1,404	17	-21.68	-0.18
Urban [1]	731,139		70.53	91.80
Rural [2]	65,285		39.50	8.20
State	796,424		66.27	100.0

Source: U.S. Department of Commerce. "Census 2000 Redistricting Data (PL-94-171) Summary File, Table PL1 and 1990 Census." Census Bureau: Washington D.C. 2000 and 1990.
[1] Urban counties of Nevada are Carson City, Clark, and Washoe Counties.
[2] Rural counties are the remaining fourteen of Nevada's 17 counties.

Trends in the Census of Population data from 1990 to 2000 for Lander County can be summarized as follows:

- Lander County's 2000 population of 5,794 ranked the county twelfth among Nevada's 17 counties.
- Lander County did not change its rank among counties in the state of Nevada from 1990 to 2000.
- Lander County's population decreased from the 1990 Census to the 2000 Census by 472 persons. This means that Lander County realized a population growth rate of -7.53 percent during the past decade.
- From 1990 to 2000, the county with the largest population growth was Clark County with 634,306 additional persons.
- The population growth rate for Clark County was 85.55 percent accounting for 79.64 percent of total state population growth.
- In contrast, Lander County contributed -0.06 percent to overall state population growth from 1990 to 2000.
- Given one-man, one-vote, the population growth which occurred in Clark County will only increase the county's political importance.
- A fairly stagnant population growth rate in the 1990s impeded housing stock development in Lander County.

Census Population by Age

Demographic characteristics of an area refer to age and gender of residents. Demographic composition changes slowly over time as new residents are added through birth and immigration, and as resident population are lost through death and outmigration.

Table 4 shows county median age for 1990 and 2000. Even at the state and national levels, the population is aging. Median population age for the nation increased from 32.9 years of age in 1990 to 35.3 years of age in 2000, while the state of Nevada increased from 33.3 years of age in 1990 to 35.0 years of age in 2000 (U.S. Department of Commerce, 2000 and 1990). For all counties in the state of Nevada, median age was older in 2000 than in 1990.

For Lander County, the median age increased from 33.8 years of age in 1990 to 37.7 years of age in 2000. This aging of the population should be of interest to policymakers in Lander County. Also, compared to 2000 median values for the state and the nation, Lander County has an older population.

Table 4. Median Age by County for the State of Nevada, 1990 and 2000.

County	1990	2000
	years of age	years of age
Carson City	36.6	38.7
Churchill	33.0	34.7
Clark	33.1	34.4
Douglas	36.2	41.7
Elko	29.4	31.2
Esmeralda	35.8	45.1
Eureka	33.3	38.3
Humboldt	30.6	33.4
Lander	**28.7**	**34.1**
Lincoln	33.4	38.8
Lyon	36.4	38.2
Mineral	33.9	42.9
Nye	36.5	42.9
Pershing	31.7	34.4
Storey	37.6	44.5
Washoe	33.6	35.6
White Pine	33.8	37.7
State Of Nevada	33.3	35.0
U.S.	32.9	35.3

Source: U.S. Department of Commerce. "Census 2000 Redistricting Data (PL-94-171) Summary File, Table PL1 and 1990 Census." Bureau of Census: Washington D.C. 2000 and 1990.

Table 5. Population by Age and Proportionate Share of Population by Age for Lander County, 1990 and 2000.

Age Group	1990		2000	
	Number	Proportionate share	Number	Proportionate share
		(%)		(%)
Under 5	616	9.83	433	7.47
5 to 9	624	9.96	574	9.91
10 to 14	581	9.27	557	9.61
15 to 19	467	7.45	442	7.63
20 to 24	**442**	**7.05**	**253**	**4.37**
25 to 34	**1,146**	**18.29**	**714**	**12.32**
35 to 44	990	15.80	969	16.72
45 to 54	673	10.74	876	15.12
55 to 59	209	3.34	343	5.92
60 to 64	147	2.35	230	3.97
65 to 74	239	3.81	238	4.11
75 to 84	107	1.71	117	2.02
85 and above	25	0.40	48	0.83
TOTAL	6,266	100.00	5,794	100.00

Source: U.S. Department of Commerce. Table DP-1, Profile of General Demographic Characteristics: 2001." Bureau of Census: Washington D.C. 2001.

Table 5 sheds some light on the aging of the population in Lander County. When analyzing the age groupings in Lander County, it should be noted that overall county population decreased from 1990 to 2000 by 7.53 percent. For the 20 to 24 years of age group and the 25 to 34 years of age group, population declined by 39.11 percent, and their absolute numbers declined by 621 persons from 1990 to 2000.

The demographics for Lander County are similar to many rural counties in the nation. Often rural counties lose population in age groups 20 to 24 years and 25 to 34 years of age because the young people with the best education, health, the most marketable skills and abilities leave the rural areas to realize their potential. Lander County, like many rural counties, decreased in absolute numbers in population from 20 to 35 years of age, and like many rural counties, realized a decrease in proportionate share this age group makes of total county population. By capturing the population age group of persons 20 to 34 years of age, the county gains future leaders, innovators and entrepreneurs. Taxes collected in the county to invest in local education will now earn dividends in other counties.

The age-population data for Census 1990 to 2000 for Lander County can be summarized as follows:

- Median age for Lander County has increased to 34.1 years of age in 2000, compared to 28.7 years of age in 1990.
- The aging of the population is a state and national trend; however, Lander County's aging has been greater.
- With overall population for Lander County decreasing by 7.53 percent from 1990 to 2000, population decreased by 16.69 percent for age groups 20 to 24 years of age and 25 to 34 years of age.
- The decrease in these two population groups should be of concern to Lander County's decision makers because these young people are the basis for future economic and entrepreneurial growth for the county. Also, these groups impact housing demands as families.

State Demographer Population Growth and Stability, 1970 to 2007

The State of Nevada Demographer derives annual population estimates for the State of Nevada Department of Taxation (2008). Using these annual estimates, county average annual population growth rates and stability from 1970 to 2007 were developed and shown in Table 6. Lander County's average annual population growth rate was estimated to be -0.26 percent,

which ranks Lander County thirteenth among Nevada's 17 counties. Lander County also ranked as the fifth highest in instability of population growth rates. Results from Table 9 show Lander County population growth to be unstable and increasing slowly. This instability is linked to the "boom-bust" nature of Lander County's primary economic sector, which is mining. This instability limits the building of local housing stock. Risk of vacant homes during downturns in the mining industry is a consideration of home builders. The average of annual percentage growth rate of population (AAGR) used in Table 6 is the summation of each year's percentage change from 1970 to 2004 divided by the number of years:

$$AAGR = \frac{\sum_{t=1970}^{2004} \left(\frac{population_{t+1} - population_t}{population_t} \right)}{2007 - 1970}$$

The instability index is the coefficient of variation, or the absolute value of the standard deviation of the series of annual population growth rates divided by AAGR as defined above. A high instability index indicates that the annual percentage population growth varies considerably over time. Such instability may be characteristic of a one sector county economy and may signify the need for local economic diversification. Also this economic instability causes home builders not to build because of the potential of vacant houses.

Table 6. Nevada County Population Growth Rate and Stability Index, 1970 – 2007.

County	1970-2007 Average of Annual Growth Rates	Rank	Instability Index	Rank
Nye	5.58	1	0.97	10
Douglas	5.38	2	0.57	14
Clark	5.07	3	0.24	17
Storey	4.84	4	0.97	11
Lyon	4.64	5	0.47	15
Carson City	3.49	6	0.78	12
Elko	3.38	7	1.00	8
Washoe	3.14	8	0.29	16
Humboldt	2.68	9	0.98	9
Pershing	2.57	10	1.26	7
Churchill	2.47	11	0.73	13
Esmeralda	2.26	12	4.39	3
Lander	**2.11**	**13**	**2.73**	**5**
Eureka	1.55	14	4.54	2
Lincoln	1.20	15	2.75	4
White Pine	-0.26	16	12.91	1
Mineral	-1.04	17	2.21	6
Nevada	4.39		0.20	

State Demographer Population Growth by Different Time Periods

Table 7 shows average annual percentage change in population and county ranks for Nevada's 17 counties from 1970 to 2004. Also annual average annual compound growth rates and ranks are derived by decades that are 1970 to 1979, 1980 to 1989, 1990 to 1999, and 2000 to 2007. In addition the two latest county growth rates and ranks were derived for 2006 and 2007.[1]

It is interesting to look at the variability of Lander County through time. From 1970 to 1979, Lander County population increased at an average annual rate of 3.45 percent. From 1980 to 1989, the average annual growth rate was positive at 4.90 percent. From 1990 to 1999, the average annual growth rate for Lander County population was -0.25 percent, and from 2000 to 2007, Lander County growth rate was -0.48 percent.

During the 1990s, only three counties realized negative average population growth rates (Lander, Mineral and Esmeralda Counties). However, from 2000 to 2007, six Nevada counties realized negative population growth rates (Eureka, Lander, Lincoln, Mineral, Pershing and White Pine Counties). In 2006, three Nevada counties realized negative population growth rates, while in 2007 four Nevada counties had negative population growth rates. Of interest is that in 2006, Lander County population increased by 2.65 percent and increased by 1.63 percent in 2007. From 2006 to 2007, Lander County has experienced population and economic growth as the local mining sector's economic activity has increased.

[1] Note that the compound growth rate will differ somewhat from the average of annual growth rates calculated in Table 10. Annual compound growth rate is calculated with the formula,
$CGR = [(population_{final\ year}/population_{initial\ year})^{(1/t)}]-1.$

Table 7. Nevada Population by County Average Annual Growth Rates, 1970 - 2007, by Decade, 2006 and 2007.

County	1970 - 2007 Growth Rate (%)	Rank	1970 - 1979 Growth Rate (%)	Rank	1980 - 1989 Growth Rate (%)	Rank	1990 - 1999 Growth Rate (%)	Rank	2000- 2007 Growth Rate (%)	Rank	2006 Growth Rate (%)	Rank	2007 Growth Rate (%)	Rank
Nye	5.58	1	4.62	6	7.63	1	6.27	1	3.79	3	8.46	2	3.60	5
Douglas	5.38	2	11.22	1	3.70	8	4.26	5	3.60	4	3.32	4	1.19	11
Clark	5.07	3	5.30	4	4.84	6	6.23	2	4.55	2	4.37	3	4.24	4
Storey	4.84	4	7.19	3	5.72	4	3.80	6	2.65	5	2.44	12	4.50	2
Lyon	4.64	5	4.37	7	4.47	7	5.70	3	4.68	1	10.58	1	3.46	6
Carson City	3.49	6	7.89	2	2.49	14	2.83	11	1.81	9	1.05	14	0.04	13
Elko	3.38	7	1.61	14	7.03	2	3.43	7	1.20	11	1.58	13	4.33	3
Washoe	3.14	8	4.82	5	2.95	11	2.97	10	2.62	6	3.08	6	2.19	7
Humboldt	2.68	9	3.37	10	3.23	9	3.08	9	1.23	10	2.65	9	1.70	9
Pershing	2.57	10	1.73	13	3.06	10	4.96	4	(0.10)	12	3.25	5	1.73	8
Churchill	2.47	11	2.75	12	2.89	12	3.25	8	1.86	8	2.96	7	(0.66)	16
Esmeralda	2.26	12	2.82	11	6.42	3	(2.90)	17	2.17	7	(1.10)	15	(2.06)	17
Lander	**2.11**	**13**	**3.45**	**9**	**4.90**	**5**	**(0.25)**	**15**	**(0.48)**	**14**	**2.65**	**9**	**1.63**	**10**
Eureka	1.55	14	0.71	15	2.66	13	1.20	12	(1.04)	16	(1.68)	16	(0.14)	14
Lincoln	1.20	15	4.02	8	0.20	17	0.91	13	(0.86)	15	2.60	11	4.94	1
White Pine	(0.26)	16	(2.46)	17	0.64	15	0.41	14	(0.44)	13	2.88	8	0.50	12
Mineral	(1.04)	17	(1.46)	16	0.43	16	(2.11)	16	(1.46)	17	(4.97)	17	(0.50)	15
Nevada	4.39	-	4.96	-	4.23	-	5.17	-	3.87	-	4.14	-	3.63	

The trend in Lander County population may be summarized below:

- Lander County's 2000 population of 5,794 amounted to 0.29 percent of the state's total and ranked Lander County twelfth among Nevada's 17 counties.
- From 1970 to 2007, Lander County realized average annual population growth rates of -2.11 percent, which ranked Lander County thirteenth among Nevada's 17 counties.
- From 1970 to 2007, Lander County ranked the fifth highest in instability index of Nevada's 17 counties.
- Lander County's average annual rate of population growth in the 1980s (4.90 percent) was greater than the 1970s' average (3.45 percent). In the 1990s, Lander County's average annual rate of population growth (-0.25 percent) was negative. The 2000 to 2007 period witnessed a negative growth rate, -0.48 percent. However, in 2006 and 2007, population growth had become positive because of expanding mining activities.
- In 2006, Lander County population growth rate increased by 2.65 percent but population growth declined to 1.63 percent by 2007.
- From 2000 to 2007, six of Nevada's 17 counties had negative annual population growth rates. These counties were Eureka (-1.04 percent), Lander (-0.48 percent), Lincoln (-0.86 percent), Mineral (-1.46 percent), Pershing (-0.10 percent), and White Pine (-0.44 percent) Counties. All of these counties were heavily dependent upon the mining sector, which decreased operations from 2000 to 2007.
- The variability of county population growth rates from 1970 to 2007 indicates the dependency on a single economic sector such as mining. This instability also hinders the development of new housing stock and indicates the need for economic diversification efforts in some Nevada counties including Lander County.

Labor Trends

Labor force is an economic statistic that shows the number of persons looking for employment. In the Mountain States when a mine closes, the unemployment rate may not increase as in other areas of the nation. This occurs because people leave the area and as a consequence, the labor force declines. Table 8 compares labor force for Lander County, state of Nevada and the United States from 2004 to 2007.

Table 8. Labor Force for Lander County, Nevada, State of Nevada and U.S., 2004-2007.

Year	Lander (number)	Nevada (1,000)	United States (1,000)
2004	2,468	1,188.6	147,401.0
2005	2,714	1,229.7	149,320.0
2006	2,770	1,284.5	151,428.0
2007	3,375	1,335.9	153,124.0

Source: State of Nevada Department of Employment, Rehabilitation and Training. "Labor Force, Employment, Unemployment, and Unemployment Rates (LAUS)." Research and Analysis Bureau: Carson City, Nevada, Various Issues.

From Table 8, Lander County has had an increasing labor force over the period from 2004 to 2007. For Lander County, labor force increased by 3.67 percent over the past four years. The state of Nevada and the nation realized a steady increase in labor force from 2004 to 2007. The increase in labor force in Lander County reflects the expansion in local mining activity. To maintain this labor force growth, adequate housing comes into play.

For Lander County, the unemployment rate fluctuated between 3.6 percent and 4.3 percent from 2004 to 2007 (Table 9). The unemployment rate for Lander County is below the state's and nation's unemployment rate from 2004 to 2007. This is an indication of expansion that has occurred in the local mining industry. Also, this shows pent-up demand for adequate local housing in Lander County.

Table 9. Unemployment Rate for Lander County, State of Nevada and U.S., 2004-2007.

Year	Lander (%)	Nevada (%)	United States (%)
2004	4.3	4.5	5.5
2005	3.7	4.2	5.1
2006	4.0	4.2	4.6
2007	3.6	4.8	4.6

Source: State of Nevada Department of Employment, Rehabilitation and Training. "Labor Force, Employment, Unemployment, and Unemployment Rates (LAUS)." Research and Analysis Bureau: Carson City, Nevada, Various Issues.

From Table 10, the number of unemployed in Lander County increased from 107 in 2004 to 120 in 2007. For the state of Nevada, the number of unemployed declined from 2004 to 2005 but increased to 64,380 in 2007. As for the nation, the number of unemployed declined from 8,149,000 in 2004 to 7,078,000 in 2007.

Table 10. Number of Unemployed for Lander County, State of Nevada and U.S., 2004-2007.

Year	Lander (number)	Nevada (1,000)	United States (1,000)
2004	107	54,079	8,149
2005	101	51,636	7,591
2006	112	54,243	7,001
2007	120	64,380	7,078

Source: State of Nevada Department of Employment, Rehabilitation and Training. "Labor Force, Employment, Unemployment, and Unemployment Rates (LAUS)." Research and Analysis Bureau: Carson City, Nevada, Various Issues.

Labor trends (Table 11) from Regional Economic Information System (U.S. Department of Commerce, 2008) show employment in Lander County is quite variable. Employment was at its highest during 1997 at 3,556 employees. This employment declined to 2,398 in 2002 and subsequently increased to 2,756 in 2006. Of interest, average annual employment growth from 1990 to 2006 in Lander County was -1.09 percent with wage and salary employment growth of -1.51 percent while proprietor employment realized average annual growth rate of 0.88 percent. This shows the significance of proprietor employment to current and future employment trends in Lander County.

The Department of Commerce has produced a new data source to follow local entrepreneurs called "Nonemployer Statistics." Nonemployer firm counts are firms that do not hire employees. These are entrepreneurs in the county. For Lander County, total nonemployer firms decreased by -0.12 percent while firms that employ declined by -1.37 percent. The nonemployer statistics show the importance of these entrepreneurs as a source for future economic development in Lander County. The Other Services Sector had the largest number of nonemployer firms in 2005 followed by the Retail Trade Sector, the Professional, Scientific and Technical Services Sector and the Construction Sector. Adequate housing can entice proprietors to live in Lander County and can entice employers to live in Lander County which will help nonemployer establishments to become employer establishments.

Table 11. Employment Data and Graphs for Lander County.

Employment by Industry

Lander County, Nevada

Categories Based on Standard Industrial Classification Breakdowns

Employment Category	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total full-time and part-time employment	3,283	3,214	3,231	3,032	3,109	3,206	3,462	3,556	3,241	3,024	2,837
Wage and salary employment	2,787	2,687	2,707	2,521	2,595	2,635	2,874	2,920	2,628	2,444	2,236
Proprietors employment	496	527	524	511	514	571	588	636	613	580	601
Farm proprietors employment	60	60	62	77	77	74	74	75	76	76	76
Nonfarm proprietors employment	436	467	462	434	437	497	514	561	537	504	525
Farm employment	139	118	122	143	153	136	157	180	175	177	179
Nonfarm employment	3,144	3,096	3,109	2,889	2,956	3,070	3,305	3,376	3,066	2,847	2,658
Private employment	2,667	2,605	2,611	2,388	2,443	2,549	2,774	2,831	2,495	2,269	2,085
Agricultural services, forestry, & fishing	(D)	28	25	18	12	30	30	44	(D)	(D)	(D)
Mining	1,406	1,310	1,289	1,089	1,020	1,121	1,245	1,345	1,148	1,057	866
Transportation and public utilities	116	107	(D)	(D)	(D)	(D)	(D)	114	102	79	88
Construction	132	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Manufacturing	(D)	(D)	35	48	54	(D)	(D)	(D)	(D)	(D)	(D)
Wholesale trade	37	20	22	44	58	67	66	58	(D)	33	29
Retail trade	327	353	382	381	483	515	557	535	470	449	479
Finance, insurance, and real estate	68	56	60	61	49	76	84	134	152	136	(D)
Services	549	587	544	519	463	441	468	459	414	364	339
Government and government enterprises	477	491	498	501	513	521	531	545	571	578	573
Federal, civilian	89	87	90	93	93	89	83	80	82	80	91
Military	20	18	19	16	15	13	14	14	13	11	11
State and local	368	386	389	392	405	419	434	451	476	487	471
State government	30	36	35	35	36	35	37	36	39	53	49
Local government	338	350	354	357	369	384	397	415	437	434	422

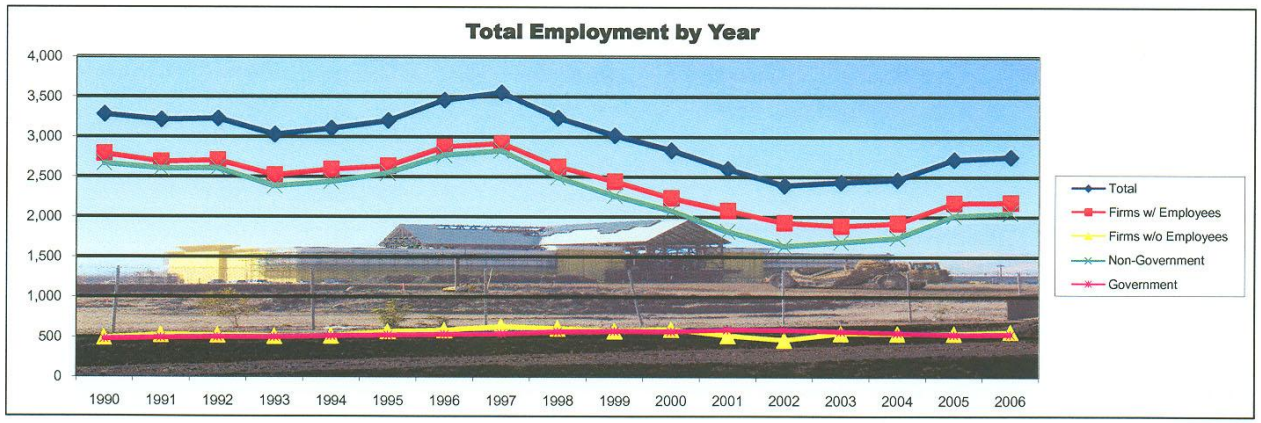
Categories Based on North American Industrial Classification Breakdowns

Employment Category	2001	2002	2003	2004	2005	2006
Total employment	2,605	2,398	2,439	2,471	2,724	2,756
Wage and salary employment	2,081	1,929	1,889	1,924	2,176	2,185
Proprietors employment	524	469	550	547	548	571
Farm proprietors employment	77	76	74	74	74	74
Nonfarm proprietors employment	447	393	476	473	474	497
Farm employment	180	157	172	166	169	164
Nonfarm employment	2,425	2,241	2,267	2,305	2,555	2,592
Private employment	1,826	1,646	1,693	1,751	2,021	2,057
Forestry, fishing, & related activities	(D)	(D)	(D)	(D)	(D)	(D)
Mining	711	628	601	(D)	665	682
Utilities	(D)	(D)	(D)	(D)	(D)	(D)
Construction	(D)	(D)	(D)	(D)	(D)	(D)
Manufacturing	(D)	(D)	(D)	(D)	(D)	(D)
Wholesale trade	(D)	(D)	(D)	(D)	(D)	(D)
Retail trade	334	310	314	328	353	367
Transportation and warehousing	89	100	104	118	136	155
Information	(D)	(D)	(D)	(D)	(D)	(D)
Finance and insurance	45	34	(D)	(D)	42	39
Real estate and rental and leasing	18	18	(D)	(D)	39	43
Professional and technical services	(D)	(D)	(D)	(D)	35	42
Management of companies and enterprises	0	0	0	0	0	0
Administrative and waste services	(D)	30	(D)	(D)	56	58
Educational services	(L)	(L)	(L)	(L)	10	11
Health care and social assistance	54	51	57	57	53	60
Arts, entertainment, and recreation	17	32	44	(D)	(D)	(D)
Accommodation and food services	176	159	156	(D)	(D)	(D)
Other services, except public administration	79	77	(D)	76	(D)	(D)
Government and government enterprises	599	595	574	554	534	535
Federal, civilian	90	93	95	90	84	82
Military	11	10	10	10	10	11
State and local	498	492	469	454	440	442
State government	50	54	55	56	39	42
Local government	448	438	414	398	401	400

1990-2006 Average Annual Growth Rates

Total full-time and part-time employment	**-1.09%**
Wage and salary employment	**-1.51%**
Private employment	**-1.61%**
Government and government enterprises	**0.72%**
Proprietors employment	**0.88%**

Note: Due to the conversion from the SIC to NAICS industrial classification system as a result of the NAFTA Agreement, trending the private employment industries between 2000 & 2001 is not possible for the above employment breakdowns.



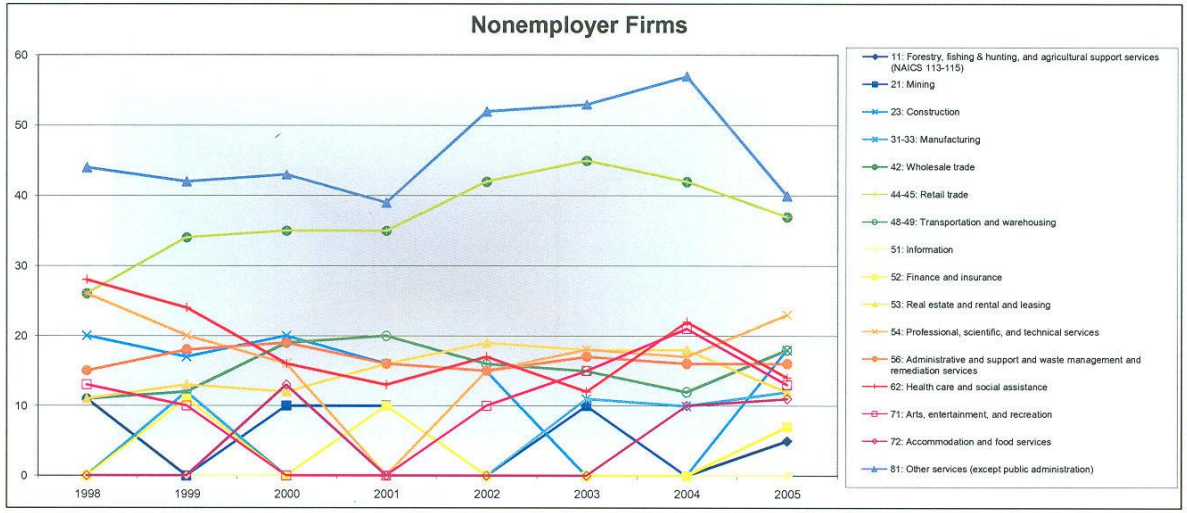
Source: Bureau of Economic Analysis, U.S. Department of Commerce
http://www.bea.gov/regional/reis/CA25fn.cfm
http://www.bea.gov/regional/reis/CA25Nfn.cfm

Table 12. Nonemployer and Employer Establishment Numbers, Lander County, 1998-2005.

Nonemployer Firms

Lander County, Nevada

Source: US Census



NAICS Code	Description	1998-2005 Average Annual Growth Rate: Non-employers	1998-2005 Average Annual Growth Rate: Employer Firms
00	Total for all sectors	-0.12%	-1.37%
11	Forestry, fishing & hunting, and agricultural support services	-10.65%	n/a
21	Mining	n/a	-11.40%
22	Utilities	n/a	0.00%
23	Construction	-1.49%	0.00%
31-33	Manufacturing	n/a	-9.43%
42	Wholesale trade	n/a	-4.03%
44-45	Retail trade	5.17%	-0.73%
48-49	Transportation and warehousing	7.29%	5.96%
51	Information	n/a	0.00%
52	Finance and insurance	n/a	3.24%
53	Real estate and rental and leasing	1.25%	7.57%
54	Professional, scientific, and technical services	-1.74%	-14.52%
55	Management of companies and enterprises	n/a	0.00%
56	Administrative and support and waste management and remediation	0.93%	0.00%
61	Educational services		
62	Health care and social assistance	-9.43%	-2.57%
71	Arts, entertainment, and recreation	0.00%	5.96%
72	Accommodation and food services	n/a	-5.97%
81	Other services (except public administration)	-1.35%	3.24%

NAICS Code	Description	1998			1999			2000			2001			2002			2003			2004			2005		
		Non-Employers	Employer Firms	Total Firms	Non-Employers	Employer Firms	Total Firms	Non-Employers	Employer Firms	Total Firms	Non-Employers	Employer Firms	Total Firms	Non-Employers	Employer Firms	Total Firms	Non-Employers	Employer Firms	Total Firms	Non-Employers	Employer Firms	Total Firms	Non-Employers	Employer Firms	Total Firms
00	Total for all sectors	243	98	341	240	95	335	237	90	327	220	88	308	244	98	342	251	93	344	266	82	348	241	89	330
11	Forestry, fishing & hunting, and agricultural support services	11	0	11	d	0	0	d	0	0	d	0	0	d	0	0	d	1	1	d	1	1	5	0	5
21	Mining	d	7	7	d	7	7	10	7	17	10	6	16	d	4	4	10	3	13	d	4	4	7	3	10
22	Utilities	d	1	1	0	1		0	1	1	0	2	2	0	2	2	0	1	1	0	1	1	0	1	1
23	Construction	20	6	26	17	5	22	20	5	25	16	4	20	15	5	20	d	3	3	d	5	5	18	6	24
31-33	Manufacturing	d	2	2	12	2		d	4	4	d	4	4	d	2	2	11	3	14	10	1	11	12	1	13
42	Wholesale trade	d	4	4	d	4	4	0	3	3	0	3	3	d	4	4	d	2	2	d	2	2	7	3	10
44-45	Retail trade	26	20	46	34	18	52	35	16	51	35	16	51	42	17	59	45	20	65	42	18	60	37	19	56
48-49	Transportation and warehousing	11	4	15	12	5	17	19	5	24	20	6	26	16	5	21	15	5	20	12	5	17	18	6	24
51	Information	d	3	3	0	2	2	d	2	2	d	2	2	0	3	3	0	2	2	d	3	3	0	3	3
52	Finance and insurance	d	4	4	11	4	15	d	4	4	10	4	14	d	5	5	d	5	5	d	5	5	7	5	12
53	Real estate and rental and leasing	11	3	14	13	3	16	12	3	15	16	4	20	19	4	23	18	4	22	18	3	21	12	5	17
54	Professional, scientific, and technical services	26	3	29	20	3	23	16	2	18	d	2	2	15	4	19	18	3	21	17	1	18	23	1	24
55	Management of companies and enterprises	0	1	1	0	2	2	0	2	2	0	2	2	0	1	1	0	1	1	0	1	1	0	1	1
56	Administrative and support and waste management and remediation services	15	3	18	18	3	21	19	2	21	16	3	19	15	2	17	17	3	20	16	3	19	16	3	19
61	Educational services	d	1	1	d	1	1	d	1	1	d	1	1	d	1	1	d	1	1	d	0	0	d	0	0
62	Health care and social assistance	28	6	34	24	6	30	16	5	21	13	5	18	17	6	23	12	5	17	22	5	27	14	5	19
71	Arts, entertainment, and recreation	13	2	15	10	3	13	d	1	1	d	1	1	10	4	14	15	4	19	21	2	23	13	3	16
72	Accommodation and food services	d	20	20	d	19	19	13	18	31	d	15	15	d	19	19	d	19	19	10	13	23	11	13	24
81	Other services (except public administration)	44	8	52	42	7	49	43	8	51	39	8	47	52	10	62	53	8	61	57	8	65	40	10	50

D = Disclosed

Nonemployer Definition:
A nonemployer business is one that has no paid employees, has annual business receipts of $1,000 or more ($1 or more in the construction industries), and is subject to federal income taxes. Most nonemployers are self-employed individuals operating very small unincorporated businesses, which may or may not be the owner's principal source of income.

Source: U.S.Census Bureau; www.census.gov/epcd/nonemployer/

Housing Supply

This section will discuss housing supply and other characteristics in Lander County. The U.S. Census supplies much of the housing information for county-wide analysis. From Table 1, the number of houses built by year is of interest. Given the rapid growth in Clark County and Washoe County, Nevada, most housing in the state of Nevada has been built since 1970. Between 1970 and 1990, 60 percent of Lander County's housing stock was built as compared to 40 percent and 39 percent, respectively, for the state of Nevada and the nation.

From Table 13, the amount of land use and construction from 1998 to 2007 is shown for Lander County and Battle Mountain. The amount of acreage and square feet under construction has been somewhat variable from 1998 to 2007.

Table 14 shows growth in mobile homes and multi-unit construction versus single-family housing. Table 14 shows the number of new houses built by type from 1990 to 2007. This shows a developing trend in single-family-detached and mobile home construction from 1990 to 2007. It also shows a decline in new home construction in Lander County which will hurt further economic development efforts. From Table 14, the growth rate for single-family-detached homes and mobile homes built from 1990 to 2007 is declining. From 1990 to 2007, the growth rate per year for building single-family-detached homes was -0.04 percent per year and for mobile homes it was -2.17 percent per year. Therefore, a problem for Lander County is a 17 year decline in building single-family-detached and mobile home stock.

Table 13. Construction by Land Use for Lander County from 1998 to 2007.

Amount of Construction By Land Use Type: 1998 - 2007

Source: Lander County Assessor's Office

Lander County, Nevada

Construction By Year	1998			1999			2000			2001			2002			2003			2004			2005			2006			2007		
Land Use Code Description	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt
Single Family Res	6	115	126,027	3	46	6,000	3	93	41,484	1		11,935				2	1	59,690	2	8	350,061				2	5		3	1	24,535
Mobile Homes	30	107	519,972	19	114	184,682	12	21	287,916	3	19								4	6	41,802	1	5		16	130	67,195	8	25	94,440
2 Single Family Units	2	5																												
General Commercial					6	70,907	1	2	87,280		10			2	87,120					3	87,120									
Grand Total:	38	228	645,999	22	166	261,589	16	117	416,680	4	29	11,935		2	87,120	2	1	59,690	6	17	478,983	1	5			135	67,195	11	26	118,975

Battle Mountain Area; Lander County, Nevada

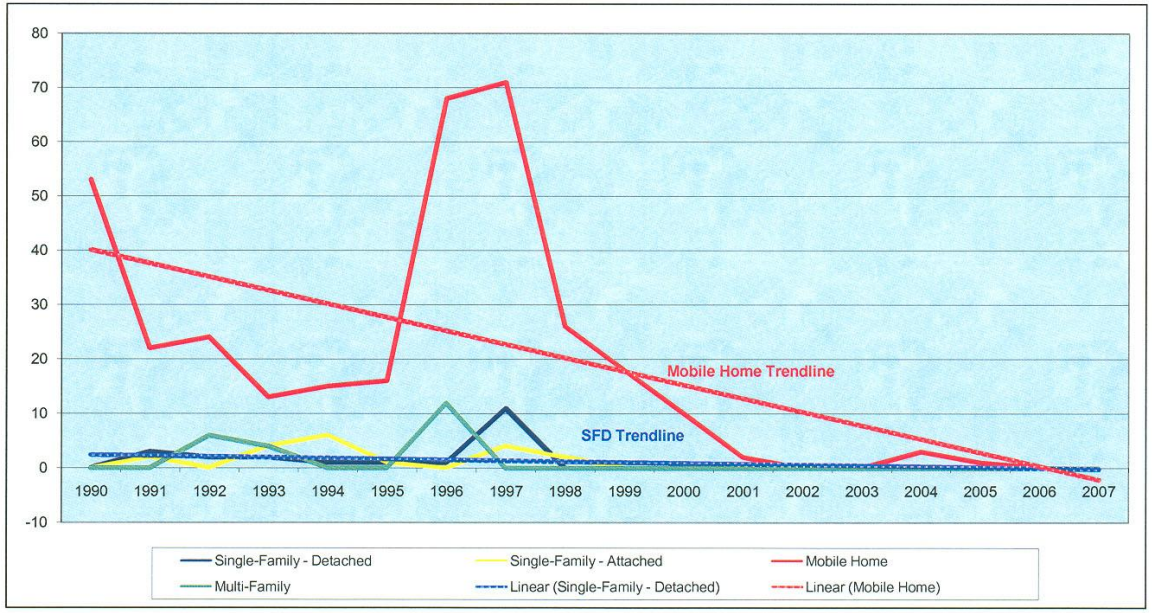
Construction By Year	1998			1999			2000			2001			2002			2003			2004			2005			2006			2007		
Land Use Code Description	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt	Units	Acres	SqFt
Single Family Res	2	15		2	10	6,000	1	53	0																1	2		3	1	
Mobile Homes	29	98	118,032	18	111	60,256	10	16	43,613	2	9								3	5	20,089				15	129	52,507	7	23	77,008
2 Single Family Units	2	5																												
General Commercial					5	27,000	1	2	87,280		10			2	87,120					3	87,120									
Grand Total:	33	118	118,032	20	126	93,256	12	71	130,893	2	19			2	87,120				3	8	107,209					131	52,507	10	24	77,008

Table 14. Resident Units Built in Lander County, 1990 to 2007.

Residential Units by Type & Year Built

Battle Mountain; Lander County, Nevada

Calendar Year	Single-Family - Detached	Single-Family - Attached	Mobile Home	Multi-Family	Total
1990	0	0	53	0	**53**
1991	3	2	22	0	**27**
1992	2	0	24	6	**32**
1993	2	4	13	4	**23**
1994	1	6	15	0	**22**
1995	1	1	16	0	**18**
1996	1	0	68	12	**81**
1997	11	4	71	0	**86**
1998	0	2	26	0	**28**
1999	0	0	18	0	**18**
2000	0	0	10	0	**10**
2001	0	0	2	0	**2**
2002	0	0	0	0	**0**
2003	0	0	0	0	**0**
2004	0	0	3	0	**3**
2005	0	0	1	0	**1**
2006	0	0	0	0	**0**
2007	0	0	0	0	**0**
TOTAL	**21**	**19**	**342**	**22**	**404**
%	5.2%	4.7%	84.7%	5.4%	100.0%
1990-1999 Avg Per Year	2.1	1.9	32.6	2.2	38.8
2000-2007 Avg Per Year	0.0	0.0	2.0	0.0	2.0
1990-2007 Avg Per Year	1.2	1.1	19.0	1.2	22.4



Housing Demand in Lander County

The following section discusses the estimation of housing demand in Lander County. Primarily by using Bureau of Census data, the demand for housing can be estimated. First, it will be assumed that average persons per household will remain constant at 2.73. In addition, even though the Census publishes population estimates at the county level for these years, there is no estimate of group quarters. In 2000, 86 persons, or 1.5 percent of the population lived in group quarters. Therefore for the future, group quarters estimate will be assumed to be 86. This value can be changed if better estimates are obtained.

Projections of housing demand for the community in 2000 and 2007 may also be developed by applying the same methodology to U.S. Census projections of population for county. Using this technique, Lander County was estimated to have a demand for 3,758 housing units in 2000. This declined to 2,395 in 2007 due to the decline in population estimates for Lander County for 2000 to 2007.

By using Census data to estimate demand for housing, community leaders can at least obtain a view of their housing market. One further recommendation however, is to make the analysis more realistic by consulting with major employers in the area. Many employers may have a good idea about how many of their employees live in the city and county and how many commute a considerable distance. These employers may be able to estimate an additional demand for housing among their own employees who would not otherwise be counted in the estimate because they do not live in the city or county.

Estimating Housing Demand

Some basic data collection is necessary before housing demand can be estimated. Initial data can be collected from the U.S. Census web site (www.census.gov) or at the State of Nevada Demographer web site (http://www.nsbdc.org/what/data_statistics/demographer/pubs/). The following information is required:

1. U.S. Census and Nevada State Demographer population estimates for Lander County for 2000 to 2007.
2. U.S. Census and Nevada State Demographer population projections for the county.

3. U.S. Census and Nevada State Demographer estimated population in group quarters for 2000.
4. U.S. Census and Nevada State Demographer estimates of average persons per household for the community in 2000.

For example, in 2000, Lander County had an estimated population of 5,794; however, 86 lived in group quarters (Nevada State Prison). Thus, the actual population to be housed in 2000 was 5,708. The average persons per household in Lander County in 2000 were 2.73. Thus, the number of households in Lander County can be found by dividing the population to house (5,708) by the average persons per household (2.73). Estimated number of households in Lander County in 2000 was 2,091.

According to Census data, the state of Nevada averages 0.908 households per housing unit. Literally less than one household lives in one housing unit. This is a statistical idiosyncrasy stemming from the fact that people and households are counted separately from housing units in Census years. Applying this ratio to the calculation of housing demand maybe optional, and could increase the housing demand estimate.

Applying the ratio of 0.908 households per housing unit to the number of households in Lander County generates the preliminary housing demand for Lander County in 2000. Specifically, 2,091 households divided by 0.908 households per housing unit equals 2,303 housing units. In addition, a recommended four percent vacancy rate may be added to preliminary demand to produce the estimated demand for housing in Lander County. In 2000, the estimate was 2,395 (2,303 times 1.04).

The four percent vacancy rate is suggested by Jerry Knox, Associate Professor of Community and Regional Planning at Iowa State University. The vacancy ratio is used because in an efficient housing market, prospective buyers should be met with a variety of choices of units so that they might choose which one, if any, best suits their needs. This four percent vacancy rate is a variable over which community leaders in Lander County has control. If the county has declining population rates, the four percent vacancy rate maybe too high and the rate could be decreased. From these housing supply and demand estimates, a gap report on local housing in Lander County can be estimated.

For projections of housing demand, the State of Nevada Department of Employment, Training and Rehabilitation projects employment for counties. From past data, Lander County has 2.77 persons per employee. Also for the housing demand analysis, a place-of-work capture facture is used. If the place-of-work capture factor is set at 1.0, this means the county captures all workers as residents. For the first analysis it is assumed all place-of-work employees in Lander County will live in Lander County. For the Lander County estimation, an employment vacancy value was calculated. For this analysis, 200 jobs are designated as employment vacancies. These are existing jobs that are vacant, jobs associated with projects under construction and jobs associated with expansion projects that have been postponed due to workforce issues. The employment vacancy value of 200 was calculated from discussions with Lander County area employers. All factors and data discussed in this section were used in the housing gap analysis. Also, some of these factors will be modified in the final analysis to derive sensitivity of results.

Gap Analysis

For the Gap Analysis, four scenarios will be developed and run. The purpose of the four scenarios is to show how the model can be changed to run sensitivity analysis. For the first two scenarios, the housing gap result will be one composite value. That is housing includes single-family-detached, condos, multi-family, and mobile homes. For the last two scenarios, the housing gap statistic will be for single-family-detached, condos, multi-family, and mobile homes.

Scenario 1: Full Capture-Aggregate Housing

For the first scenario, it is assumed that all place-of-work employees will live in Lander County with 200 employment vacancy, and only 129 uninhabited homes. Following the definition of standard housing by HUD, substandard housing units are those units that use coal, wood, or "other" sources for heat. The housing data shown in Table 15 can be updated and changed in the spreadsheet program

Table 15. Factors Used in First Scenario Housing Gap Analysis for Lander County.

Category	Values
Employment Vacancy	200
Place-of-Work Capture Factor	1.00
Population per Employee	2.77
Group Quarters Estimate	86
Average Persons per Household	2.73
Household per Housing Unit – NV	0.908
Vacancy Rate	0.04
Uninhabited Units	129

From conversations with personnel at the State of Nevada Department of Employment, Training, and Rehabilitation, it is assumed that employment from 2007 to 2009 will grow at 1.9 percent annually. Therefore, the employment in Lander County is estimated to be 2,862 in 2009. Also for this scenario, it is assumed that all employment will reside in Lander County or the place-of-work capture will be 1.0.

Using factors in Table 15 and an assumed 1.9 annual percentage growth rate in Lander County employment, a first scenario housing gap analysis for Lander County is initiated. From Table 16, using an employment vacancy value of 200 and an uninhabited housing value of 129, the housing shortage gap in Lander County is estimated to be 871.

Table 16. First Scenario Gap Analysis for Lander County, 2009.

Category	2009
Place-of-Work Employment	2,862
Place-of-Work Capture Factor	1.0000
Place-of-Residence Employment	2,862
Employment Vacancy	200
Employment Estimate	3,062
Population per Employee	2.77
Population Estimate	8,482
Group Quarter Estimate	86
Percent Population in Group Quarters	1.01%
Population to be Housed	8,396
Average Persons per Household	2.73
Number of Households	3,075
Household per Housing Units - NV	0.908
Preliminary Housing Demand	3,387
Vacancy Rate	0.04
Demand with Vacancy Rate	3,522
Housing Stock	2,780
Uninhabited Units	129
Available Housing	2,651
Housing Gap	-871

For sensitivity analysis of scenario one, if one assumes the number of uninhabited homes are those built 1970 and earlier or 527 homes, the housing shortage gap in Lander County increases to 1,269 housing units.

Scenario 2: Partial Employment Capture, No Employment Vacancy, and Additional Uninhabited Units

For the second scenario it is assumed that only 80 percent of the place-of-work employees will live in Lander County with zero employment vacancy, and 527 homes were assumed uninhabited. The factor data shown in Table 17 is used for the scenario two gap analysis. These values can be changed later for sensitivity analysis of given results.

Table 17. Factors Used in Second Scenario Housing Gap Analysis for Lander County.

Category	Values
Employment Vacancy	0.0
Place-of-Work Capture Factor	0.8
Population per Employee	2.77
Group Quarters Estimate	86
Average Persons per Household	2.73
Household per Housing Unit – NV	0.908
Vacancy Rate	0.04
Uninhabited Units	527

With employment in Lander County forecasting to grow at 1.9 percent annually, the employment in Lander County in 2009 is forecasted to be 2.862. Also for this scenario and from a referenced study by Vogt, Williams, and Bowen Research (2009), the place-of-work capture is assumed to be eight percent (80%).

Using factors in Table 17 and an assumed 1.9 annual percentage growth rate in Lander County employment, a second scenario housing gap study for Lander County is initiated. From Table 18, using an employment vacancy value of 0.0 and an uninhabited housing value of 527, the housing shortage gap in Lander County is estimated to be 372.

Table 18. Second Scenario Gap Analysis for Lander County, 2009.

Category	2009
Place-of-Work Employment	2,862
Place-of-Work Capture Factor	0.8000
Place-of-Residence Employment	2,290
Employment Vacancy	0
Employment Estimate	2,290
Population per Employee	2.77
Population Estimate	6,342
Group Quarter Estimate	86
Percent Population in Group Quarters	1.36%
Population to be Housed	6,256
Average Persons per Household	2.73
Number of Households	2,292
Household per Housing Units - NV	0.908
Preliminary Housing Demand	2,524
Vacancy Rate	0.04
Demand with Vacancy Rate	2,625
Housing Stock	2,780
Uninhabited Units	527
Available Housing	2,253
Housing Gap	-372

Scenario 3: Full Capture – Disaggregated Housing

This scenario will be similar to scenario one in that all place-of-work employees live in Lander County with 200 employment vacancies, and only 129 uninhabited homes. As in scenario one, the uninhabited housing is determined by the HUD definition. Also, housing is disaggregated into four housing segments. These housing segments are single-family-detached, condominiums, multi-family, and mobile homes. From 2000 Census (2000), the percentage of total housing in Lander County was 34.1% in single-family housing, 1.3% in condominiums, 3.9% in multi-family housing, and 60.7% in mobile homes. It will be assumed that the estimated demand for housing will follow this disaggregation of total housing.

Table 19. Factors Used in the Third Scenario Housing Gap Analysis for Lander County.

Category	2009
Employment Vacancy	200
Place-of-Work Capture Factor	1.00
Population per Employee	2.77
Group Quarter Estimate	86
Average Persons per Household	2.73
Household per Housing Units - NV	0.908
Vacancy Rate	0.04
Uninhabited Units	129
Percentage Housing – Single-Family	34.1%
Percentage Housing - Condominiums	1.3%
Percentage Housing - Multi-Family	3.9%
Percentage Housing - Mobile Home	60.7%

With employment in Lander County forecasting to grow at 1.9 percent annually, the employment in Lander County in 2009 is forecasted to be 2,862. Also for this scenario, it is assumed that all employment will reside in Lander County or the place-of-work capture will be 1.0.

Using factors in Table 19 and an assumed 1.9 annual percentage growth rate in Lander County employment, a third scenario housing gap analysis for Lander County is initiated. From Table 20, using an employment vacancy value of 200 and an uninhabitable housing value of 129, the housing shortage gap for Lander County is estimated to be detached-single housing of 298, condominiums 12, multi-family housing 35, and 526 mobile homes.

Table20. Third Scenario Housing Gap Analysis for Lander County, 2009.

Category	2009
Place-of-Work Employment	2,862
Place-of-Work Factor in County	1
Place of Residence Employment	2,862
Employee Vacancy	200
Employment Estimate	3,062
Population per Employee	2.77
Population Estimate	8,482
Group Quarter Estimate	86
Percent Population in Group Quarters	1.01%
Population to be Housed	8,396
Average Persons per Household	2.73
Number of Households	3,075
Household per Housing Units - NV	0.908
Preliminary Housing Demand	3,387
Vacancy Rate	0.04
Overall Demand with Vacancy Rate	3,522
Single-Detached Factor	0.341
Condo Factor	0.013
Multi-Family Factor	0.039
Mobile Home Factor	0.607
Single-Family-Detached Demand	1,201
Condo Factor Demand	46
Multi-Family Demand	137
Mobile Home Demand	2,138
Housing Stock Detached	947
Housing Stock Condo	36
Housing Stock Multi-Family	107
Housing Stock Mobile Home	1,690
Uninhabited Units Detached	44
Uninhabited Units Condo	2
Uninhabited Units Multi-Family	5
Uninhabited Units Mobile Home	78
Available Housing Detached	903
Available Housing Condo	34
Available Housing Multi-Family	102
Available Housing	1,612
Housing Gap Detached	-298
Housing Gap Condo	-12
Housing Gap Multi-Family	-35
Housing Gap Mobile Home	-526
Total Housing Gap	-871

Scenario 4: Partial Employment Capture, No Employment Vacancy, Additional Uninhabited Units, and Disaggregated Housing

In the fourth scenario, it is assumed that only 80 percent of place-of-work employees will live in Lander County, with zero employment vacancy, and 527 homes were assumed uninhabitable. Also, housing is disaggregated as in scenario three. The factor data shown in Table 21 is used for scenario four gap analysis. These values can be changed later for sensitivity analysis of a given result.

Table 21. Factors Used in the Fourth Scenario Housing Gap Analysis for Lander County.

Category	2009
Employment Vacancy	0.0
Place-of-Work Capture Factor	0.8
Population per Employee	2.77
Group Quarter Estimate	86
Average Persons per Household	2.73
Household per Housing Units - NV	0.908
Vacancy Rate	0.04
Uninhabited Units	527
Percentage Housing – Single-Family	34.1%
Percentage Housing - Condominiums	1.3%
Percentage Housing - Multi-Family	3.9%
Percentage Housing - Mobile Home	60.7%

With employment in Lander County forecasted to grow at 1.9 percent annually, the employment in Lander County in 2009 is forecasted to be 2,862. Also for this scenario and from a referenced study by Vogt, Williams and Bowen Research (2009), the place-of-work capture is assumed to be eight percent (80%).

Using factors in Table 21 and assuming the 1.9 annual percentage growth rate in Lander County employment, a fourth scenario housing gap study for Lander County was initiated. From Table 22, using an employment vacancy value of 0.0 and an uninhabited housing value of 527 homes, the housing shortage gap in Lander County was estimated to be 128 detached-single-family homes, five condominiums, 16 multi-family homes, and 222 mobile homes.

Table 22. Fourth Scenario Housing Gap Analysis for Lander County, 2009.

Category	2009
Place-of-Work Employment	2,862
Place-of-Work Factor in County	0.8
Place of Residence Employment	2,290
Employee Vacancy	0
Employment Estimate	2,290
Population per Employee	2.77
Population Estimate	6,342
Group Quarter Estimate	86
Percent Population in Group Quarters	1.36%
Population to be Housed	6,256
Average Persons per Household	2.73
Number of Households	2,292
Household per Housing Units - NV	0.908
Preliminary Housing Demand	2,524
Vacancy Rate	0.04
Overall Demand with Vacancy Rate	2,625
Single Detached Factor	0.341
Condo Factor	0.013
Multi-Family Factor	0.039
Mobile Home Factor	0.607
Single-Family-Detached Demand	895
Condo Factor Demand	34
Multi-Family Demand	102
Mobile Home Demand	1,593
Housing Stock Detached	947
Housing Stock Condo	36
Housing Stock Multi-Family	107
Housing Stock Mobile Home	1,690
Uninhabited Units Detached	180
Uninhabited Units Condo	7
Uninhabited Units Multi-Family	21
Uninhabited Units Mobile Home	319
Available Housing Detached	767
Available Housing Condo	29
Available Housing Multi-Family	86
Available Housing	1,371
Housing Gap Detached	-128
Housing Gap Condo	-5
Housing Gap Multi-Family	-16
Housing Gap Mobile Home	-222
Total Housing Gap	-372

Housing Affordability

Table 23 shows 2007 mortgage qualifying income estimates for Lander County. Based on current single-family and manufactured home sales values, assessed valuations, and household owner costs, the estimated annual income to qualify for a home in Lander County is $42,153 for single-family units and $38,478 for manufactured units. The 2007 median sales price for single-family homes is $118,000 and $108,000 for manufactured homes. Using median sales prices in the mortgage amortization schedule, and using a 30-year fixed loan at 6.0 percent interest rate with a 10 percent down payment, the annual mortgage payments are estimated to be $7,784 for single-family and $7,224 for manufactured homes. In addition to the annual mortgage payments, other ownership costs including annual mortgage insurance payments (0.5 percent of the loan value), property taxes (property tax rate of 3.66 x median assessed value/100), services and utilities (gas, power, water, sewer and trash), and home insurance (0.22 percent of the home's market value) are added together to get a grand total of actual home ownership costs in Lander County.

The estimated "qualifying income" is then calculated by dividing the total home ownership costs by the ratio of total costs as a percent of household income. The ratio of owner costs as a percent of household income is varied from location to location, but the Department of Housing and Urban Development (HUD) recommends 28 percent as the factor for generating qualifying income. The higher the percentage, the more a household spends on housing costs. The 2000 Census reports that Lander County homeowners had mortgage payments that were 16.5 percent of annual income. The lower the costs as a percent of household income ratio, however, equates into a higher qualifying income. As a result, the 28 percent factor provided by HUD should be used as a maximum value in order to calculate the lowest qualifying income possible.

The 2000 Census reports that 1,027 families (65.4 percent) could qualify for a single-family home and 1,085 families (69.1 percent) could qualify for a manufactured home based on their annual incomes and current median values of housing. Approximately a third (30.9 percent) of Lander County families cannot afford the most affordable type of home ownership (manufactured housing) based on the 2007 estimated qualifying income and 2000 Census

family income data. It should be noted that the number of families that can and cannot afford home ownership is based on the current median price. Therefore, half of the market housing is priced less than the median price and consequently decreases the qualifying income and increases the number of families that potentially could afford the mortgage.

Table 23. Mortgage Qualifying Income Estimates for Lander County, 2007.

2007 Mortgage Qualifying Income Estimates

Lander County, Nevada

	Single Family	Manufactured
Number of Units Built 1970 & After and Sold in 2007	23	37
Sales Ranges	$10k - $243k	$6k - $165k
Median Sales Price	**$118,000**	**$108,000**
Monthly Payments Based on a 30-Year Loan at a 6.3% Interest Rate & 10% Down Payment	$657.00	$602.00
Annual Mortgage Payments	$7,884	$7,224
Annual Mortgage Insurance Payments (0.5%)	$531.00	$486.00
Property Tax Rate	3.3657	3.3657
Median Assessed Value of Units Built 1970 & After	$21,639	$12,663
Property Tax Per Year	$728	$426
	(Property Tax = Assessed Value/100 x Tax Rate)	
Assumed Costs for Power, Water, Sewer, Trash, & Heat Per Year ($200/Month)	$2,400	$2,400
(Source of cost for water, sewer, & trash: Desert Mountain Realty, Inc. Cost for power and heat is $150.00 per month).		
Home Insurance	$260	$238
(Home insurance is estimated to be 0.22% of the unit's market value)		
Total Owner Costs (Yearly)	$11,803	$10,774
(Total Owner Costs = Mortgage + MIP + Taxes + Utilities + Insurance)		
Owner Costs as a % of HH Income (HUD)	28.0%	28.0%
(Owner costs include house payments, real estate taxes, fire insurance, flood insurance, power, water, heat, and home association fees.)		
Estimated Qualifying Income	**$42,153**	**$38,478**
(Estimated Qualifying Income = Total Owner Costs/Owner Costs as a % of Household Income)		

Number of Families by Annual Family Income (2000 Census)		
Total:	1,569	100.0%
Less than $10,000	96	6.1%
$10,000 to $14,999	64	4.1%
$15,000 to $19,999	60	3.8%
$20,000 to $24,999	61	3.9%
$25,000 to $29,999	56	3.6%
$30,000 to $34,999	97	6.2%
$35,000 to $39,999	72	4.6%
$40,000 to $44,999	84	5.4%
$45,000 to $49,999	133	8.5%
$50,000 to $59,999	238	15.2%
$60,000 to $74,999	298	19.0%
$75,000 to $99,999	231	14.7%
$100,000 to $124,999	58	3.7%
$125,000 to $149,999	21	1.3%
$150,000 to $199,999	0	0.0%
$200,000 or more	0	0.0%

Single Family:		
Estimated Number of Families That **Can** Qualify	1027	65.4%
Estimated Number of Families That **Cannot** Qualify	542	34.6%
Manufactured Home:		
Estimated Number of Families That **Can** Qualify	1,085	69.1%
Estimated Number of Families That **Cannot** Qualify	484	30.9%

2000 Census Median Family Income	$51,538
2008 HUD Median Family Income Estimate	$64,700
2000-2008 Average Annual Growth Rate	2.9%
2000 Per Capita Income (Bureau of Economic Analyses, U.S. Dept. of Commerce)	$25,598
2006 Per Capita Income (Bureau of Economic Analyses, U.S. Dept. of Commerce)	$36,465
2000-2006 Average Annual Growth Rate	6.1%

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Conclusion

Without sufficient housing stock, rural counties in Nevada may find it difficult to compete for economic development. However, for many rural Nevada counties like Lander County, the variability of population and employment makes development of new housing stock difficult.

A housing gap analysis provides Lander County decision makers with information as to possible housing shortages for economic development. Also affordable housing may be an issue for Lander County in its economic development efforts. The lack of affordable and adequate housing impacts the ability of Lander County as to who they can recruit and the number of workers may live in the county.

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