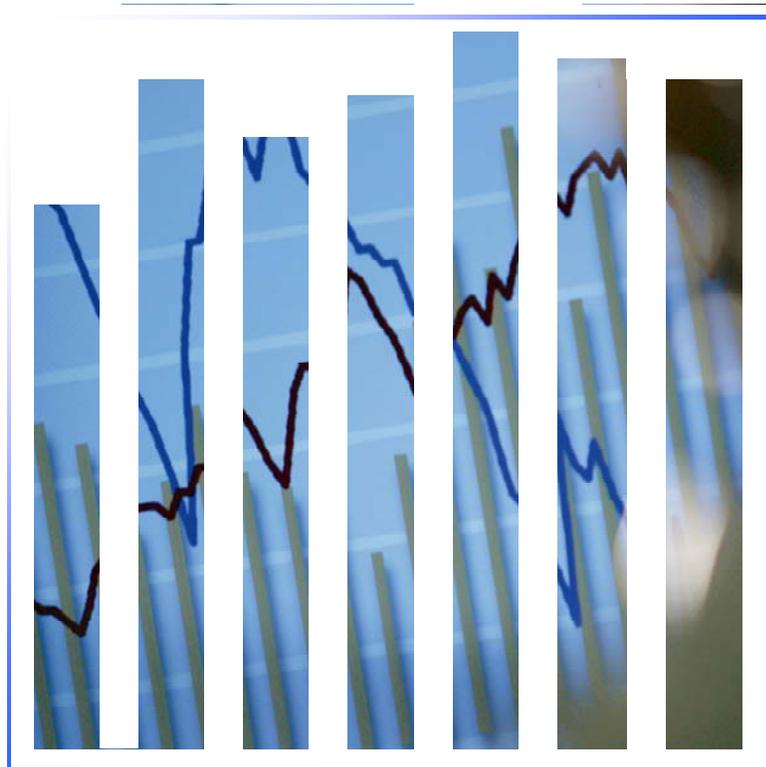


Potential Impacts of Water Resource Uncertainty in Southern Nevada



Prepared for:
Southern Nevada Water Authority

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Introduction

Appplied Analysis (“AA”) was retained to review and analyze relevant, readily available information regarding the potential impacts of water resource uncertainty in southern Nevada. Generally, information reviewed focused on the Nevada economy, businesses operating within the state of Nevada, third-party analyses and other public discourse regarding water resources. Analysis of the information available focused on economic impacts (i.e., output, salaries and wages, and employment), business investment, fiscal impacts to state and local governments, social implications (e.g., quality of life) and other qualitative factors, including the experiences of other regions reporting water resource uncertainty due to drought or other factors.

Findings in Summary

Based on the research and analysis efforts undertaken and the documentation reviewed (see *Data and Information Analyzed*), it can be stated with a reasonable degree of certainty that water resource instability, or the expectation that sufficient water resources will not be available to sustain the underlying economy, will have a material negative impact on southern Nevada’s economy and fiscal structure as well as that of the state of Nevada as a whole.

An imminent water resource shortage or water rights crisis in southern Nevada -- whether perceived or in fact -- would severely undermine the region’s ability to attract new industries, organizations, and residents or garner additional investment by existing businesses. The ability of municipalities, governments or corporations to issue bonds or other debt would likely be compromised, and existing bond ratings would likely deteriorate. Human nature and a long history of uninterrupted service may lead some to view any potential threat as minor or transitory; however, a credible and substantial perceived or actual threat of water uncertainty may very well result in irreparable economic and fiscal consequences for the region.

Amidst uncertainty surrounding the region’s water supply and its ability to continue as a going concern, property values would likely decline, dipping below the decade-low prices already reported in many residential and commercial markets. The importance of water availability to existing businesses in the southern Nevada region is well-documented in many companies’ Securities and Exchange Commission filings, making it likely that any perceived or real risk to water resources would result in public disclosure and loss of investor confidence. This is the case in and out of the tourism industry – the region’s largest single sector in terms of gross domestic product,

employment and wages and salaries¹ – which is heavily dependent on water. Large resorts in southern Nevada depend on water for individual water use of guests in hotel rooms, swimming pools, golf courses, spa operations, laundering of sheets and towels, water features and landscaping, maintenance and cleaning operations, and dish-washing and food preparation in high-volume restaurants and food-service facilities. A one-percent decline in the overall Las Vegas occupancy rate is estimated to result in a \$163 million decline in net revenue for the hotel industry; a ten-percent decline would result in a decline of \$1.6 billion over the course of one year.² Severe water restrictions necessitating closure of hotel amenities such as swimming pools, spas or golf courses would likely result in an even more devastating blow to the tourism industry and the state’s economy more broadly. An additional qualitative factor worth considering is the potentially long-lasting negative public perception that may be associated with any type of water problem.

According to estimates provided by the Southern Nevada Water Authority (“SNWA”), current projections indicate that there is an anticipated water resource shortage on the horizon. Refer to Figure I, which appears on the following page.

Absent a sound plan to meet or offset the “un-met demands” shown in Figure 1, the economic and fiscal consequences summarized above and discussed throughout the balance of this report would be anticipated. According to SNWA projections, additional water supplies sourced to in-state groundwater sources will be required to meet the region’s demand for water. Refer to Figure 2, which also follows.

¹ Based on data provided by the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis; see also the analysis of this concept in Volume I, Issue VIII, *The Relative Dependence on Tourism of Major U.S. Economies*, prepared for the Las Vegas Convention and Visitors Authority by Applied Analysis in January 2010.

² Calculation by Applied Analysis, adapted from Hudson Securities, utilizing Las Vegas tourism statistics obtained from the Las Vegas Convention and Visitors Authority and the Nevada Gaming Control Board.

Figure I: Projected Water Supply and Demand
2008 – 2060, Water Demands (Acre-Feet) per Year

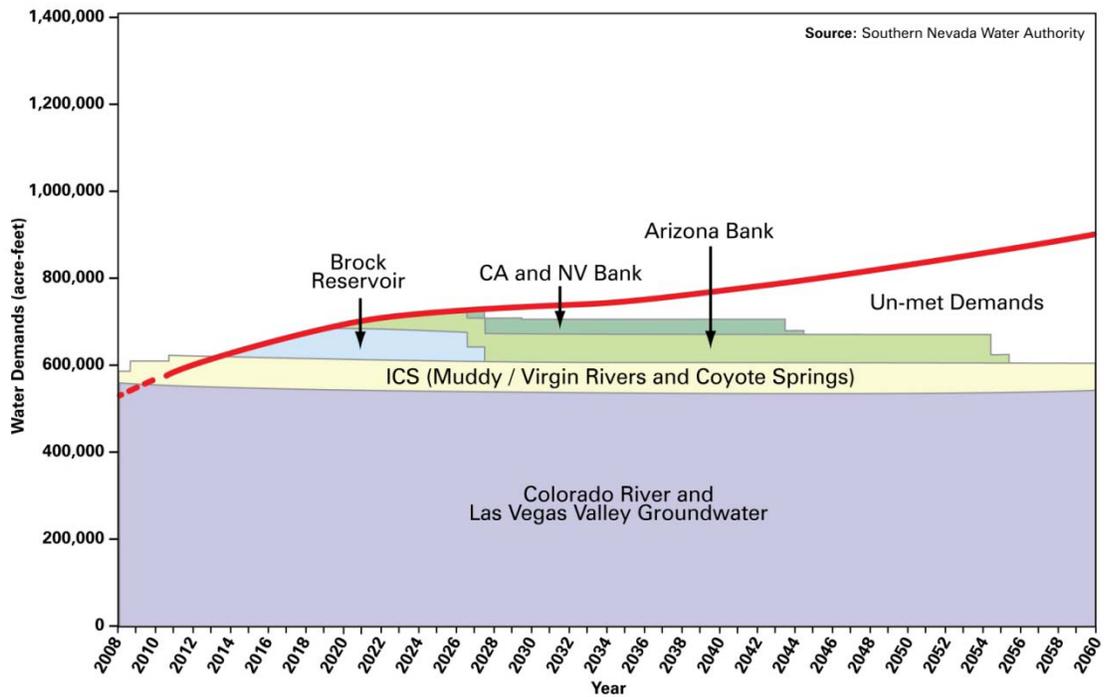
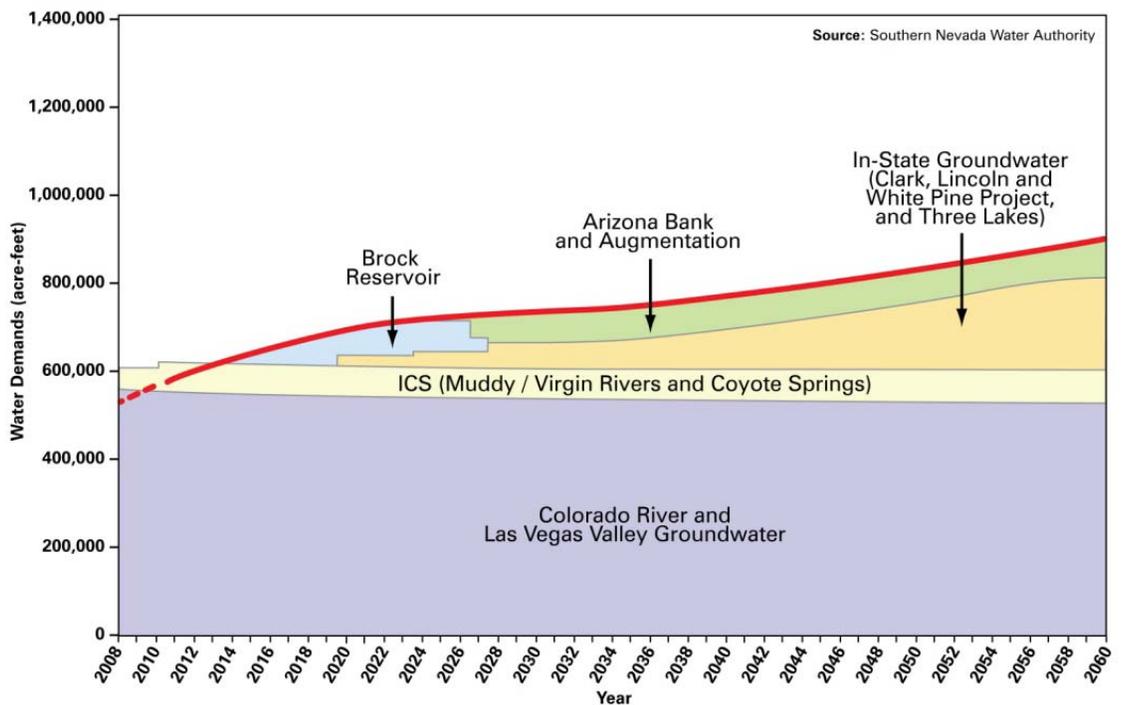


Figure II: Projected Water Supply and Demand with In-State Groundwater Sources
2008 – 2060, Water Demands (Acre-Feet) per Year



Data and Information Analyzed

Various third-party data were utilized to complete this analysis, including, without limitation, economic, financial data and disclosures for public companies, fiscal reports for local and state governments and other publications sourced to news media, public and private entities and other third party information providers.

The following highlights a sampling of the information reviewed and analyzed during the preparation of this summary report.

- ❖ Economic information were sourced to internal databases in addition to external sources such as the following:
 - U.S. Bureau of Labor Statistics
 - U.S. Bureau of Economic Analysis
 - Las Vegas Convention and Visitors Authority
 - Clark County Department of Finance
 - Nevada Department of Employment, Training and Rehabilitation
 - Nevada Department of Taxation
 - Nevada Gaming Control Board
 - Nevada Economic Forum
 - Center on Budget and Policy Priorities

- ❖ Financial data and disclosures were sourced to various Forms 10-K and 10-Q filed with the Securities and Exchange Commission, including the following companies:
 - NV Energy
 - Wynn Resorts
 - Las Vegas Sands
 - Pinnacle Entertainment
 - Herbst Gaming
 - American Casino & Entertainment Properties
 - American Post Tensions

- ❖ Fiscal reporting documents including, but not limited to, Clark County Comprehensive Annual Financial Report, Fiscal Year 2010

- ❖ Other third-party data and reports were sourced to the following:
 - Dr. William White, *The Impact of a Water Imposed Interruption of Growth in the Las Vegas Region*, 1992
 - Hobbs, Ong & Associates, *The Impact of a Growth Interruption in Southern Nevada*, 2004
 - Bloomberg Business Week, April 14, 2011, "Las Vegas, NM sees no easy solution to water woes"

- Florida Times-Union, "SBA offers assistance to Florida small businesses hurt by the drought", April 2011
- Florida Division of Emergency Management, CIEM presentation, October 2007
- Texas Star-Telegram, April 11, 2011, "State warns it may restrict water rights if drought intensifies"
- San Antonio Express News, April 12, 2011, "Drought sears farmers' hopes"
- NewsOK, "Severe drought causes boating problems at Oklahoma lakes", April 2011
- Environmental News Service, "California Faces Water Rationing, Governor Proclaims Drought Emergency", February 27, 2009
- University of Maryland, Center for Integrative Environmental Research, Economic Impacts of Climate Change on Nevada, July 2008

Summary of Analyses Conducted

Economic Impacts

The economic impacts of severe water resource restrictions in southern Nevada would likely be significant and far-reaching. Relatively sudden or more drastic restrictions would have greater impacts than gradual or mild restrictions. Such impacts would not be limited to growth-related industries such as construction and real estate development, but would expand to all sectors of the economy.

Any condition where water resources are restricted can be likened to drought conditions, irrespective of the cause of such water restrictions. The economic impacts of drought conditions on various regions across the U.S. are well-known and extensively documented.³ To put it simply, humans cannot survive without adequate fresh water supplies; nor can business and industry. Historically, civilizations evolved around primary water sources; while advancing technology has allowed societies to distance themselves from primary water sources, our demand for water remains just as great, if not significantly higher in quantity per capita.

In the case of extended water restrictions imposed upon the southern Nevada region, total economic output would initially be reduced as a result of mandated or physically-necessary slowed or ceased industrial and commercial activity, particularly for those industries most dependent on water such as tourism, agriculture, construction, many types of manufacturing and utility providers. Declines in economic output would result in employment losses; increasing levels of

³ Refer to the *Other Impact Considerations* section included in this analysis for further detail on this subject.

unemployment would result in reduced consumer demand for products and services, ultimately leading to lower economic output across multiple industry sectors. As a simple example, consider the impact extended water restrictions would have on the construction industry. Water resource limitations would likely result in delayed or cancelled construction projects, resulting in reduced output by the industry and declining demand for construction workers; as these workers lose their jobs, their consumption of other products and services declines. Reduced demand for other products and services would exacerbate a downward recessionary spiral.

Economic Output

The total economic output in the Las Vegas-Paradise metropolitan statistical area (Las Vegas MSA), or the value of all goods and services produced, totaled \$91.7 billion in 2009 (latest data available).⁴ Stated otherwise, assuming similar levels of economic output over the most recent period, annual gross domestic product (GDP) per each of the just over 800,000 employees⁵ in the Las Vegas MSA is approximately \$114,000.

The impacts of an extended period of water restrictions can be looked at from either an economic output perspective, or from an employee productivity perspective. Viewed from the perspective that a reduction in economic output leads to a reduction in employment, it is estimated that for each one-percent decline in gross product generated in southern Nevada due to the reduction or ceasing of commercial activity due to the unavailability of water, employment would decline by approximately 8,000 persons. Alternatively, for each one-percent decline in employment due to the reduction or ceasing of commercial activity – or due to reduced consumption resulting from rising unemployment – the gross product generated in the region would decline by nearly \$1 billion per year.

Of course, severe water restrictions would likely be much higher in magnitude than the illustrative one-percent reduction in gross product shown above. A ten-percent reduction in output, for example, would lead to a \$9.2 billion decline in annual gross product generated in the region. Depending on the severity and duration of such water restrictions, losses could be much greater.

As a general rule, the greater the interruption in water availability, the greater the impact would be. As stated in a study prepared by Hobbs, Ong & Associates in 2004⁶ (the “2004 study”) regarding the impact of a growth interruption in southern Nevada, “More intense interruptions [in economic growth] are associated with more far-reaching economic, fiscal and social consequences. This having been said, even

⁴ Source: U.S. Bureau of Economic Analysis, Gross Domestic Product by Metropolitan Area

⁵ Source: U.S. Bureau of Labor Statistics, State and Regional Employment; Las Vegas MSA employment as of March in both 2010 and 2011 was approximately 800,000.

⁶ See, Hobbs, Ong & Associates, *The Impact of a Growth Interruption in Southern Nevada*, February 2004; this analysis was prepared for the Southern Nevada Water Authority.

comparatively mild, yet unrelenting, interruptions would have major costs to the region and the state over the long run.” One need only look at the still-present, paralyzing impacts of the growth interruption resulting from the Great Recession (2007-2009) on the southern Nevada region to understand the accuracy of this statement. As one of the fastest-growing regions, if not the fastest, in the U.S. over much of the past 30 years, a higher-than-average share, albeit to a lesser degree than two or three years ago, of the region’s output is directly linked to growth-related sectors of the economy. As stated in the 2004 study, “over time, growth [in southern Nevada] will slow naturally as the economy matures. However, artificially interrupting this process will cause economic, fiscal and social consequences.”

It is often noted that Nevada – and southern Nevada in particular – continues to feature one of the narrowest, or least-diversified, economies in the nation. Echoing the oft-repeated sentiments of Governor Brian Sandoval and U.S. Senator Harry Reid regarding their shared desire to work towards achieving economic diversification, the state’s Commission on Economic Development, which is chaired by Nevada’s Lieutenant Governor, Brian Krolicki, states that its mission is to “promote a robust, diversified and prosperous economy, enriching the quality of life for Nevada citizens by stimulating business expansion and retention, encouraging entrepreneurial enterprise, attracting new businesses and facilitating community development to enable economic growth and prosperity.”⁷ None of these goals are possible without stable water resources.

One might argue that a water shortage is not an “artificial” interruption, *per se*; however, the question of whether any water shortage or abundance, for that matter, in a city built in a desert environment can be considered artificial is irrelevant to the question posed in this analysis. It is not the cause of the water restrictions that is important at this juncture, but their impact. Additionally, it is important to note that the term “artificial interruption” in this context is intended to refer to extended impacting conditions outside the course of normal economic cycles (e.g., otherwise normally-cycling economic conditions would have occurred *but for* the artificial interruption or water restrictions). During the course of the last 30 years, there is no readily available evidence indicating that economic growth in the region was ever prevented from occurring for an extended period of time due to an unavailability of water. This is due in large part to the efforts of the Nevada Division of Water Resources, the Las Vegas Valley Water District (“LVVWD”) and others to continue to secure new sources of water to meet the demands of a growing population. In 1990, municipal water providers in southern Nevada hired consulting firm Water Resource Management Inc. to lead a comprehensive analysis of water resources and facilities in the region.⁸ The study concluded that without serious conservation, southern Nevada would reach the limit of its existing Colorado River water supply by the mid-

⁷ See, Nevada Commission on Economic Development (NCED) website homepage for information about the Commission’s mission at www.diversifynevada.com.

⁸ See, Southern Nevada Water Authority, Water Resource Plan 2009.

1990s; with conservation, the limit could be extended to 2007. As a result of the study's findings, the community implemented its first major conservation measure in decades, "Operation Desert Lawn". The program resulted in ordinances by local municipalities restricting lawn watering during the hottest times of the day.

By February 1991, the LVVWD Board of Directors had become increasingly concerned about the fact that it may have reached capacity or possibly over-extended commitments based on the current available water supply, and therefore approved the temporary suspension of new commitments for water, as well as authorized the LVVWD General Manager to issue letters to rescind previously issued "will serve" letters that had not yet been acted upon.⁹ As staff began to review the many projects for which water rights were being potentially rescinded, it became apparent that large investments had already been made for a number of these projects, and that the new regulations required amendments.¹⁰ Ultimately, many projects in the pipeline continued to move forward during the temporary suspension period. Notwithstanding difficulties regarding previously-granted commitments, before new water commitments were permitted to resume, resolutions were adopted requiring that additional water sources would be procured and that additional conservation programs should be enacted. After the creation of the Southern Nevada Water Authority and a re-design of the water commitment process, in February 1992 the Board adopted changes to LVVWD's Service Rules regarding the process for making water service commitments to new development. Ultimately, the water resource challenge was short-lived, and comprehensive and imminent resolution of the issue prevented the region from suffering longer-term economic harm. The 1991-1992 water commitment re-design and other planning foresight, including forward-thinking conservation programs,¹¹ allowed the region to experience nation-leading growth for much of the next two decades.

In the case of an extended growth interruption in the region, the 2004 study cited an annual decline by the third year following the initial interruption ranging from 1.7 percent to 10.5 percent in economic output under conservative (i.e., a mild growth interruption) to aggressive (i.e., a more severe and longer-lasting growth interruption) scenarios.¹² The 2004 study notes that depending on the type of interruption, annual declines may slowly rise during the first and second year as the economy responds to the interruption. After the initial impact peaks in the third year, annual declines would then be expected to stabilize or worsen during the subsequent ten years depending

⁹ See, Las Vegas Valley Water District Board of Directors, March 19, 1991 Agenda Item regarding the approval of a resolution adopting water commitment regulations.

¹⁰ See, Las Vegas Valley Water District Board of Directors, May 21, 1991 Agenda Item regarding the approval of a resolution adopting amended water commitment regulations.

¹¹ Examples of forward-thinking conservation programs include outdoor watering day-of-week and time-of-day schedules as well as programs such as prohibiting front-yard lawns and rebates for the replacement of lawn with artificial turf.

¹² Declines cited are those for the third year following the onset of the theoretical interruption. A more sudden and severe water shortage would likely have more immediate and more significant impacts.

on the type of recovery that is experienced (i.e., rapid, moderate, or failure to recover).

Notably, the 2004 study commented that “A water crisis could not only bring growth to a halt [similar to other interruptions] but could prompt an outright decline in population, which could be much worse.” An enduring decline in population would not only result in a receding of growth, but would – even more significantly -- preclude expectations that the community would resume growth and development in the foreseeable future. Nevertheless, utilizing the economic output percentage-declines cited in the study, the southern Nevada region’s annual economic output would decline by \$1.6 billion and \$9.6 billion under the 1.7 percent and 10.5 percent scenarios, respectively.

Employment

As noted above, each one-percent decline in either economic output or employment levels equates to the loss of 8,000 jobs throughout southern Nevada. Continued, sustained, or worsening employment conditions typically lead to lower personal income levels, lower demand for housing, products and services, and reduced overall consumption, each of which may further compound the situation. Utilizing the percentage declines in economic output cited above, a mild growth interruption (or a 1.7-percent decline in economic output) would be expected to result in approximately 14,000 jobs lost, while a more severe growth interruption (or a 10.5-percent decline in economic output) would be expected to result in 84,000 jobs lost. Notably, these declines are stated for a one-year period; if declines in economic output continued over the course of several years, percentage-declines in employment levels would rise compared to the base year. Due to the relative immediate impact that extensive water restrictions would have on the region (in contrast to the hypothetical interruption absent a particular source or magnitude assumed in the 2004 study), the percentage-declines included herein are those that were cited by the 2004 study as the losses compared to the base year occurring in the third year following the growth interruption. In the case of a water-imposed growth interruption, impacts could grow as the economy worsens, while any subsequent recovery would occur at varying rates as well.

To put these employment losses into perspective, it is worth noting that from the start of the Great Recession in December 2007 through today, employment levels have declined by 133,000 in the Las Vegas MSA, even while a number of large developments continued to be constructed (i.e. the \$8 billion CityCenter built by MGM Resorts International and Dubai World that completed in December 2009, and the \$4 billion Cosmopolitan of Las Vegas completed in December 2010). Extended water restrictions that would preclude any additional major development in the region could be expected to surpass the Great Recession in terms of economic and employment impacts.

Salaries and Wages

Salary and wage declines resulting from a period of extended water restrictions would be expected to be commensurate with employment declines and the reduction in economic output. For each one-percent decline in employment, salary and wage payments in the Las Vegas MSA would be expected to decline by approximately \$282 million. Including other payments, such as employer contributions to pensions, the losses associated with a one-percent decline is estimated at closer to \$347 million.

Utilizing the percentage declines in economic output cited above, a mild growth interruption (or a 1.7-percent decline in economic output) would be expected to result in a decline of approximately \$480 million in wages and salaries, while a more severe growth interruption (or a 10.5-percent decline in economic output) would be expected to result in a decline of \$3.0 billion in wages and salaries. Including other payments such as employer contributions to pensions, these declines increase to \$590 million and \$3.6 billion for a mild and more severe interruption, respectively. It is also worth noting that compensation levels per employee may decline as unemployment increases and the demand for jobs among those who do not leave the region grows; such declines would further contribute to an overall decline in salaries and wages paid to workers in the region.

Business Investment

The willingness of businesses to invest is predicated on some level of certainty surrounding fiscal conditions, regulatory environment, economic conditions and the availability of resources – natural and otherwise -- necessary for operation. After an analysis of the potential return on investment, risks to achieving such a return must be considered. A threat of water unavailability or an extended restriction on water usage may preclude a business or investor from even taking the preliminary step of estimating a return on investment given otherwise ordinary economic conditions, particularly if there are other suitable locations for the project (i.e., other areas in the Southwest, the U.S., or globally).

It is worth noting that the region’s largest single sector in terms of gross domestic product, employment and wages and salaries¹³ – tourism and hospitality, is heavily dependent on water. Large resorts in southern Nevada depend on water for individual water use of guests in hotel rooms, swimming pools, golf courses, spa

¹³ Based on data provided by the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis; see also the analysis of this concept in Volume I, Issue VIII, *The Relative Dependence on Tourism of Major U.S. Economies*, prepared for the Las Vegas Convention and Visitors Authority by Applied Analysis in January 2010.

operations, laundering of sheets and towels, water features and landscaping, maintenance and cleaning operations, and dish-washing and food preparation in high volume restaurants and food-service facilities. A one-percent decline in the overall Las Vegas occupancy rate is estimated to result in a \$163 million decline in net revenue for the hotel industry; a ten-percent decline would result in a decline of \$1.6 billion over the course of one year.¹⁴ Severe water restrictions necessitating closure of hotel amenities such as swimming pools, spas or golf courses would likely result in an even more devastating blow to the industry. An additional qualitative factor worth considering is the potentially long-lasting negative public perception that may be associated with any type of water problem.

The importance of water availability to existing businesses in the southern Nevada region is well-documented in many companies' Securities and Exchange Commission (SEC) annual Form 10-K filings, making it likely that any perceived or real risk to water resources would result in public disclosure and loss of investor confidence. The list below provides examples of the types of statements made by local businesses in SEC filings regarding the importance of water availability.

- ❖ NV Energy highlighted the importance of water supplies for its Utilities' generating plants: "Assured supplies of water are important for the Utilities' generating plants, and at the present time, the Utilities have adequate water to meet their generation needs." The company also expressed concern about the effects new litigation could have on its water supply rights and operations: "The court's decision did call into question the validity of other permits, including the permits of third parties with whom we have water supply arrangements." (2010 Form 10-K, pages 16, 17)
- ❖ Wynn Resorts discussed the importance of water rights in its daily operations: "We own approximately 834 acre-feet of permitted and certificated water rights, which we currently use to irrigate the golf course. We also own approximately 151.5 acre-feet of permitted and certificated water rights for commercial use. There are significant cost savings and conservation benefits associated with using water supplied pursuant to our water rights. We anticipate using our water rights to support future development of the golf course land." Anything that affects these water rights is a concern to the company: "These risks and uncertainties include, but are not limited to those set forth in Item 1A ("Risk Factors") as well as the following: changes in state law regarding water rights." (2010 Form 10-K, page 16, 31)
- ❖ Las Vegas Sands expressed concern about the effects changes in water availability would have on the company's operations; included in its list of

¹⁴ Calculation by Applied Analysis, adapted from Hudson Securities, utilizing Las Vegas tourism statistics obtained from the Las Vegas Convention and Visitors Authority and the Nevada Gaming Control Board.

seven key risk factors (which also includes rising airfare, declining visitor volumes, and changes in gaming regulations) is a reference to water: "The risks to which we will have a greater degree of exposure include the following: ...changes in the availability of water..." (2010 Form 10-K, page 27)

- ❖ With one hotel casino property located in Nevada and others around the country, Las Vegas-based Pinnacle Entertainment noted the importance of water in its hotel and casino operations and the adverse affects changing water supplies could have: "Our properties use significant amounts of water, and a water shortage may adversely affect our operations." (2010 Form 10-K, page 10)
- ❖ Local gaming operator Herbst Gaming discussed the impacts strict water regulations could have on the company's operations: "The business of the Primm Casinos may be adversely impacted if their use of water exceeds allowances permitted by federal and local governmental agencies or if such governmental agencies impose additional requirements in connection with such use of water, which in each case could lead to an adverse impact on our operations and financial condition. The Primm Casinos are not served by a municipal water system. As a result, the water supply of such casinos is dependent on rights they have been granted to water in various wells located on federal land in the vicinity of the Primm Casinos and permits that allow the delivery of water to the Primm Casinos. These permits and rights are subject to the jurisdiction and ongoing regulatory authority of the U.S. Bureau of Land Management, the States of Nevada and California and local governmental units. While we believe that adequate water for the Primm Casinos is available, the future water needs of the Primm Casinos may exceed the permitted allowance. In such an event, future requests for additional water may not be approved or may be approved with terms or conditions that are more onerous. Any such denial or any such additional terms and conditions may have a material adverse effect on the results of operations of the Primm Casinos, thereby adversely affecting our results of operations and financial condition." (2010 Form 10-K, page 23)
- ❖ American Casino & Entertainment Properties, owners of the Stratosphere and Arizona Charlie's, discussed its dependence on water, and the effects shortages and regulations could have on its operations: "Increasing prices or shortages of energy and water may increase our cost of operations or force us to temporarily or permanently cease operations. Our properties use significant amounts of water, electricity, natural gas and other forms of energy. Our properties are located in a desert where water is scarce and the hot temperatures require heavy use of air conditioning. While we have not experienced any shortages of energy or water in the past, we cannot guarantee you that we will not in the future." (2010 Form 10-K, page 19)

- ❖ Homebuilder and concrete foundation installer American Post Tensions¹⁵ noted that water shortages could adversely impact its business: “Weather conditions and natural disasters, such as earthquakes, hurricanes, tornadoes, floods, droughts, fires and other environmental conditions, can also harm our homebuilding business on a local or regional basis.” (2010 Form 10-K, page 4)

Based on the statements above, it is clear that a water restriction or water rights crisis linked to future uncertainty would be of significant concern to local businesses. It is reasonable to expect that prospective investors or businesses interested in relocating to the southern Nevada region would share similar concerns regarding the continued availability of water.

Fiscal Impacts

In 1992, Dr. William White concluded in a report entitled *The Impact of a Water Imposed Interruption of Growth in the Las Vegas Region*¹⁶ that should Clark County suffer a sudden and severe interruption to its normal growth patterns, there would be strong and undesired economic, fiscal and social effects. With the unprecedented investment and growth in the region over the past 20 years, the state of Nevada as a whole is even more dependent on southern Nevada now than it was at the time of Dr. White’s study.

Southern Nevada currently draws nearly 40 million visitors per year who account for nearly 16 percent of statewide sales and use tax; the whole of Clark County accounts for 74 percent of statewide sales tax. Generally speaking, approximately three-quarters of major fiscal revenues from other sources, such as room tax, gaming tax and property tax are collected in Clark County, with the remaining 16 counties in the state accounting for only about one-fourth of fiscal revenues. As such, any decline in tax collections in Clark County is a major concern not only for southern Nevada, but for the entire state. Notably, Nevada’s resort industry funds approximately 46.2 percent of state general fund tax revenues through the payment of more than \$2 billion annually in sales tax, property tax and gaming tax.¹⁷ These figures suggest that nearly half the state’s budget is dependent on tourism, particularly to southern Nevada and Las Vegas.

The 2004 study states that fiscal revenues would suffer greater percentage-declines than economic output in the event of a growth interruption. Under the conservative scenario (1.7-percent decline in economic output), fiscal revenues would decline by

¹⁵ American Post Tensions provides slab-on-grade post tensioning products and services in the southwestern U.S.; it was founded in 1987 and is headquartered in Henderson, Nevada.

¹⁶ See, Dr. William T. White, *The Impact of a Water Imposed Interruption of Growth in the Las Vegas Region*, 1992; this report was prepared for the Las Vegas Valley Water District.

¹⁷ Source: Nevada Resort Association

9.7 percent in year three; under more aggressive scenarios, the decline would be even greater. Regardless of which local or state government budget a ten-percent decline is applied to, the impact on public services and programs is substantial.

In the event of water resource restrictions or an inability to obtain water rights in southern Nevada, the fiscal impact on the state and local governments would be significant and would be at least commensurate in magnitude to declines in gross domestic product. The fiscal impact of an extended water crisis may deepen as homes lose value due to the unattractiveness of moving to a region with severe water restrictions. If the region experiences overall population decline, this would also negatively impact home prices and therefore property tax revenues. General fund dollars in support of education, public safety and other essential programs for the entire state would be impacted, and declines in such funding would only serve to deteriorate the attractiveness of the region for prospective newcomers.

For comparison purposes, it is worthwhile to note that state general fund revenues declined by approximately 2.9 percent in fiscal year 2008 (compared to 2007), and by 10.3 percent in fiscal year 2009 (compared to 2008) largely due to double-digit declines in sales tax and gaming tax collections. Both of these revenue sources were heavily impacted by reduced discretionary consumer spending resulting from the impacts of the Great Recession.¹⁸ Notably, Nevada currently reports the largest general fund deficit percentage in the nation (\$1.5 billion shortfall for fiscal year 2012, which is 45 percent of the fiscal year 2011 budget).¹⁹ On a local level, declining market conditions have resulted in a 30-percent reduction in Clark County property tax collections in fiscal year 2011 compared to the peak in fiscal year 2009.²⁰ Even assuming a normalized annual growth rate in property tax collections of 3-percent per year from next year forward, it will take more than a decade to return to the level of collections reported in 2009. Water resource restrictions or an inability to obtain water rights in southern Nevada – particularly during the aftermath of the recent economic downturn – would likely put further downward pressure on property values, compounding the state’s ongoing budget crisis.

¹⁸ See, Nevada Economic Forum, May 2, 2011 Forecast Report

¹⁹ Source: Center on Budget and Policy Priorities

²⁰ Source: Clark County Department of Finance, Budget and Financial Planning, <http://www.clarkcountynv.gov/Depts/finance/budget/Documents/Property%20Tax%20Collections%20Bar%20Chart.pdf>

Other Impact Considerations

Social Impacts

Beyond the economic, business investment, and fiscal impacts noted above, there are a number of social impacts that require consideration. As noted in the 2004 study, social impacts associated with growth interruptions and the resulting decline in economic and fiscal conditions would likely include the following:

- ❖ Increased demand for public assistance programs associated with increased unemployment;
- ❖ Increased crime rates as an outfall of increased unemployment, as well as due to the potential development of blight or abandoned homes and commercial buildings;
- ❖ Increased necessary expenditures in support of public safety and criminal justice programs;
- ❖ Increased costs associated with aging infrastructure as well as reduced funds for replacement and routine maintenance; and,
- ❖ Increased densification (e.g., smaller homes on smaller lots) and reduced rates of homeownership; as disposable income declines, the amount families can afford to spend on housing declines as well.

Other Considerations

As stated previously in this analysis, a condition where water resources are restricted can be likened to drought conditions, irrespective of the cause of such water restrictions. The economic impacts of drought conditions on various regions across the U.S. are well-known and extensively documented. Examples of the impacts of recent drought conditions occurring across the U.S. are summarized below.

New Mexico (April 2011)

- ❖ Perhaps most relevant to a study of the impact of a water restriction on southern Nevada is the impact that recent drought conditions are having on the city of Las Vegas, New Mexico. The city has been under water restrictions for the past eight years, but recently the city council declared a state of emergency due to the dry winter. Hotels have been mandated to not change sheets for long-term guests more than once every four days, and restaurants have been told to serve water to customers in plastic cups, as well as not to refill water glasses unless the customer specifically asks. The city has closed hotel and motel swimming pools, hot tubs and ornamental fountains.

Outdoor watering has been banned. Residents have been asked to conserve as much water as possible by ceasing outdoor watering and using paper plates and cups to avoid washing dishes. Even if a water solution could be determined, the city believes it would be unable to absorb the cost (of a solution to correct the water shortage).²¹

Florida (March – April 2011/2007 Study)

- ❖ Many small businesses that rely on water supplies are being adversely impacted by a drought. The Small Business Administration is offering federal economic injury disaster loans to small businesses that were hurt by the drought. To be eligible, the business has to have lost money as a direct result of the drought.²²
- ❖ A study prepared in 2007 detailing the impacts the 2007 drought in Florida had on the economy noted the largest impacts were on the agriculture and tourism industries. Unemployment increased, agriculture decreased, tax collections decreased, fishing decreased, and fishing license sales decreased.²³

Texas (April 2011)

- ❖ The Texas Commission on Environmental Quality is considering restricting water rights across the state due to drought conditions. Currently, the Tarrant Regional Water District is advising customers to follow outdoor watering restrictions. However, if the drought intensifies, further restrictions may be necessary.²⁴
- ❖ Due to the severe drought conditions, corn crops may not be able to grow this year. Many ranchers are trying to sell some of their cattle in order to cut costs during the drought.²⁵

Oklahoma (April 2011)

- ❖ In Oklahoma, lake levels are low due to drought. This is impacting recreational activities, such as boating and fishing. The lakes are too low for boaters to

²¹ See, Bloomberg Business Week, April 14, 2011, "Las Vegas, NM sees no easy solution to water woes", <http://www.businessweek.com/ap/financialnews/D9MJHB400.htm>

²² See, Florida Times-Union, April 15, 2011, "SBA offers assistance to Florida small businesses hurt by the drought", <http://jacksonville.com/opinion/blog/404383/kevin-turner/2011-04-15/sba-offers-assistance-florida-small-businesses-hurt>

²³ See, Florida Division of Emergency Management, CIEM presentation, October 2007, http://www.floridadisaster.org/ciem/2007/Slides/14_Drought%20Presentation.pdf

²⁴ See, Texas Star-Telegram, April 11, 2011, "State warns it may restrict water rights if drought intensifies", <http://www.star-telegram.com/2011/04/11/2992641/state-warns-it-may-restrict-water.html> (retrieved April 15, 2011; see publisher's archives for current access)

²⁵ See, San Antonio Express News, April 12, 2011, "Drought sears farmers' hopes", <http://www.chron.com/disp/story.mpl/business/7519210.html>

avoid running aground. Also, fish numbers are declining, because smaller fish have no cover to hide from predators.²⁶

California (2009/2007 Study)

- ❖ In 2009, a state of emergency was declared in California due to drought conditions. All urban water users were asked to reduce their individual water use by 20 percent. The governor asked the Department of Water Resources to come up with short-term solutions to protect water quality and supply. "The unprecedented water supply situation facing Southern California and the rest of the state will not be solved with one or two hearty storms," said Metropolitan Board Chairman Timothy Brick. "Today, residents and businesses throughout Southern California face a three-in-four chance that they may soon feel the direct impact from drought and problems in the Sacramento-San Joaquin Delta that demand a comprehensive, sustainable solution."²⁷
- ❖ The quality of water is as important as having an adequate water supply. A 2007 study by the National Oceanic and Atmospheric Administration found that an increase in water quality in Long Beach, California, to the healthier standards of Huntington City Beach would create \$8.8 million in economic benefits over a 10-year period.²⁸

Nevada (2008 Report)

- ❖ A report detailing the economic impacts that climate change and water shortages could have on Nevada predicted that population growth in Nevada will be hurt by water shortages, which could also affect consumer spending. The report stated that tourism will be severely impacted, and it is believed golfing will be one of the hardest hit recreational activities. Also, a threat of forest fires will result in fewer visits to national parks. In addition, the report stated that water resources will need to be directed to existing commercial and residential sites, making further development difficult.²⁹

²⁶ See, NewsOK, April 13, 2011, "Severe drought causes boating problems at Oklahoma lakes", <http://newsok.com/severe-drought-causes-boating-problems-at-oklahoma-lakes/article/3557878>

²⁷ See, Environmental News Service, February 27, 2009, "California Faces Water Rationing, Governor Proclaims Drought Emergency", <http://www.ens-newswire.com/ens/feb2009/2009-02-27-093.html>

²⁸ See, Leeworthy, V.R. and Wiley, P.C., "Southern California Beach Valuation Project: Economic Value and Impact of Water Quality Change for Long Beach in Southern California," National Oceanic and Atmospheric Administration, February 2007 and Natural Resources Defense Council, "Testing the Waters 2010".

²⁹ See, University of Maryland, Center for Integrative Environmental Research, *Economic Impacts of Climate Change on Nevada*, July 2008, <http://www.cier.umd.edu/climateadaptation/Nevada%20Economic%20Impacts%20of%20Climate%20Change.pdf>

Conclusion

Based on the research and analysis efforts undertaken and the documentation reviewed and discussed herein, it can be stated with a reasonable degree of certainty that water resource instability, or the expectation that sufficient water resources will not be available to sustain the underlying economy, will have a material negative impact on southern Nevada's economy and fiscal structure as well as that of the state of Nevada as a whole. As such, actions taken to avoid or mitigate a situation of water resource instability in the region, including, without limitation, the development of the in-state water resources necessary to meet projected demand, would reasonably be expected to result in the avoidance or mitigation of the potential negative economic and fiscal impacts discussed throughout this report.

Experience of Applied Analysis

Overview

Applied Analysis is a Nevada-based advisory services firm founded in 1997. We are an information and analysis resource for both the public and private sectors. Our team has extensive experience in real estate, market analysis, urban economics, information technology, finance, and hospitality consulting.

Our team has performed analyses in Nevada, California, Mississippi, Colorado, and Illinois. We have serviced a broad spectrum of business clients, from governmental agencies to healthcare providers. We have analyzed the fiscal and economic impact of developments from 5 to 23,000 acres, and handled policy issues spanning business tax initiatives to the cost of air-quality programs.

Market Research and Economic Analysis

Since the firm's inception, the principals and staff of Applied Analysis have maintained a core competency in advisory services specific to economics, land use analyses, real estate market research, and fiscal and economic impact analyses.

In addition to our on-going tracking and analysis of land uses, development trends and real estate market data in Nevada, we have performed dozens of market analyses, supply-demand studies, feasibility analyses and impact analyses of varying magnitudes for various government agencies and private enterprises throughout the southwestern region.

We also maintain and update over 300 different leading economic indicators with the potential to impact development trends and the evolution of our unique

economic landscape. These variables are a critical link to our understanding of current and future development economic and fiscal trends.

Appendix

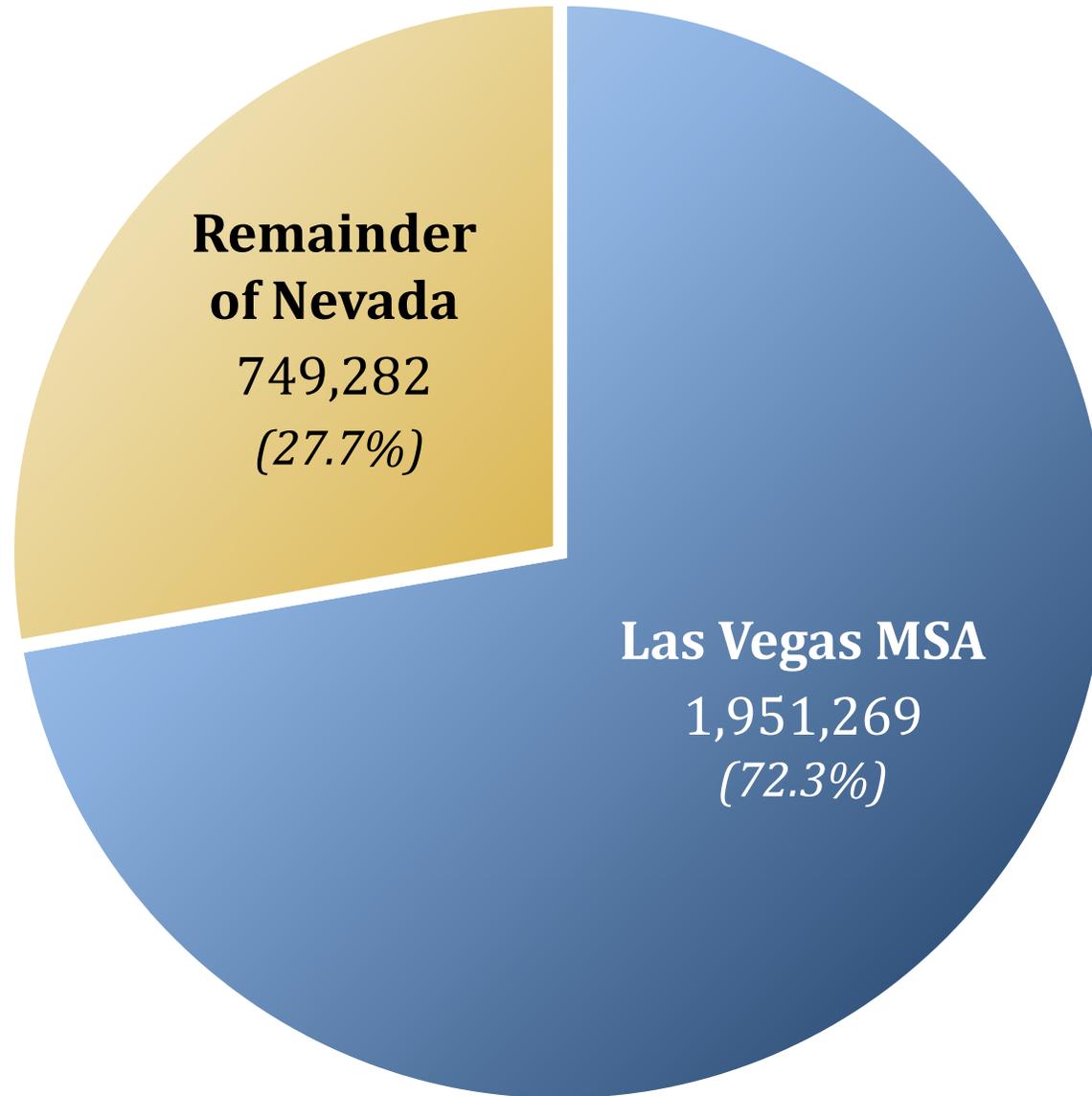
Appendix I, which follows, depicts the extent to which the statewide economy is impacted by conditions in southern Nevada.



Appendix I: Nevada's Dependence on the Southern Nevada Economy

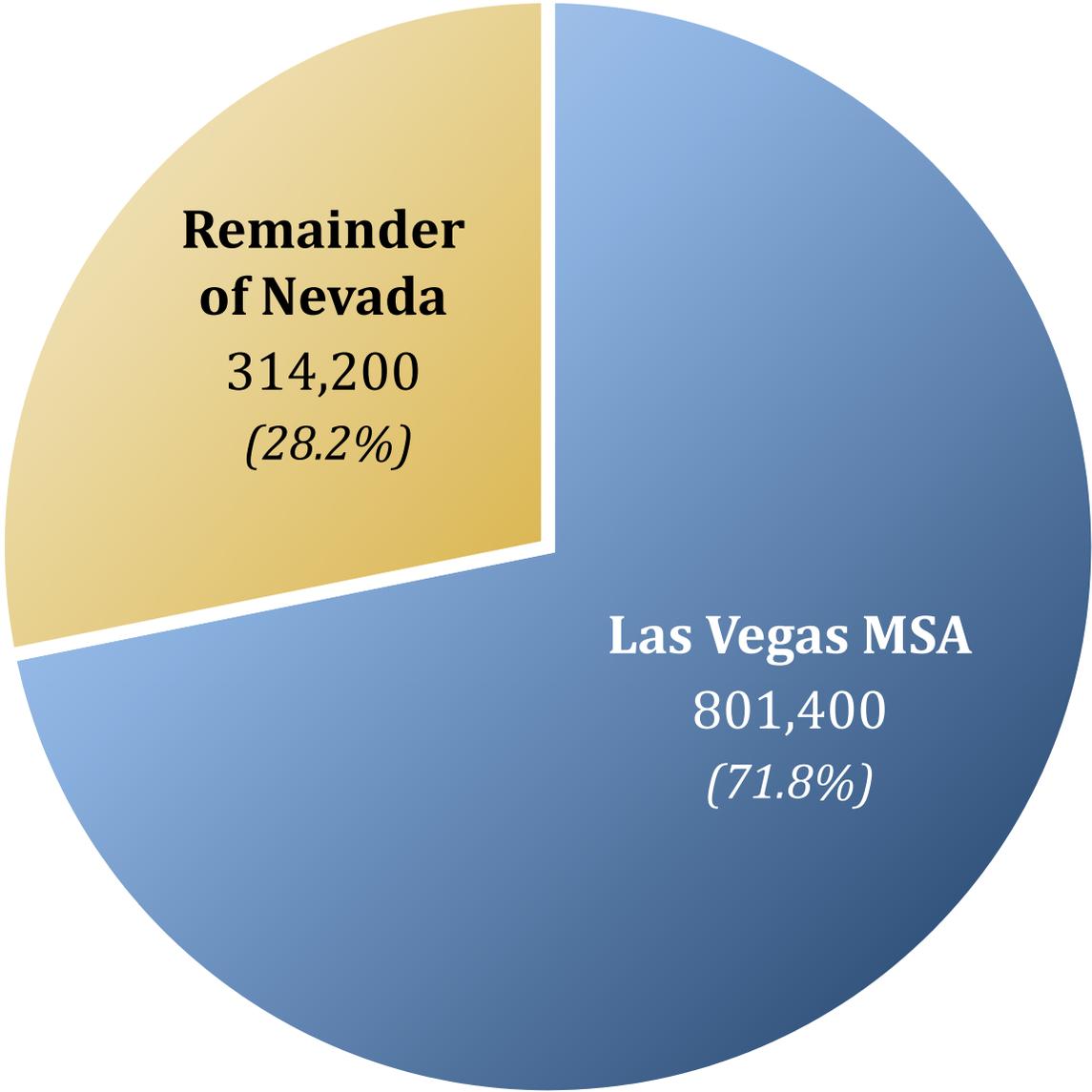
Population Estimates (2010)

Source: 2010 Census



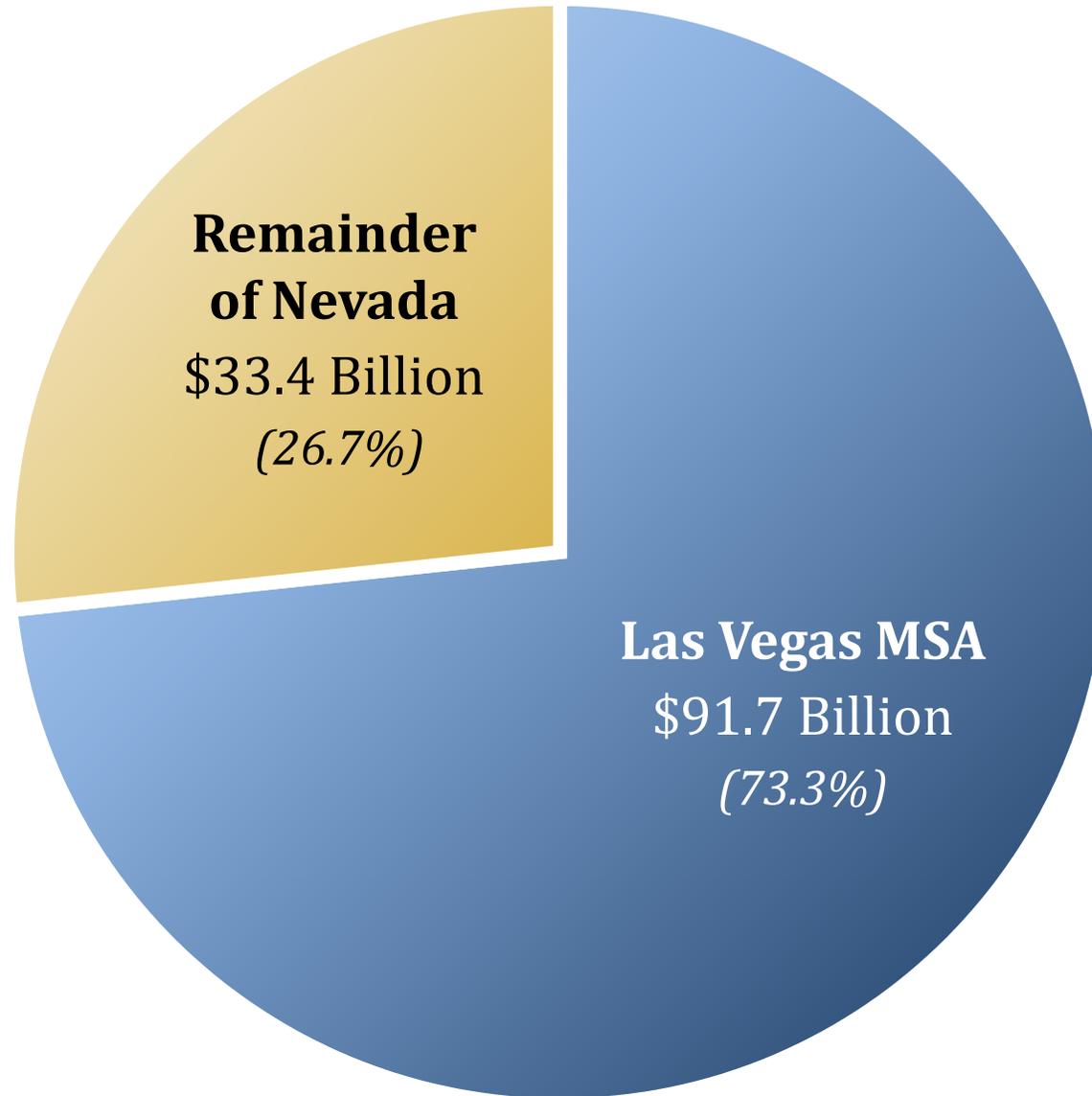
Employment Estimates (2010)

Source: Nevada Department of Employment, Training and Rehabilitation



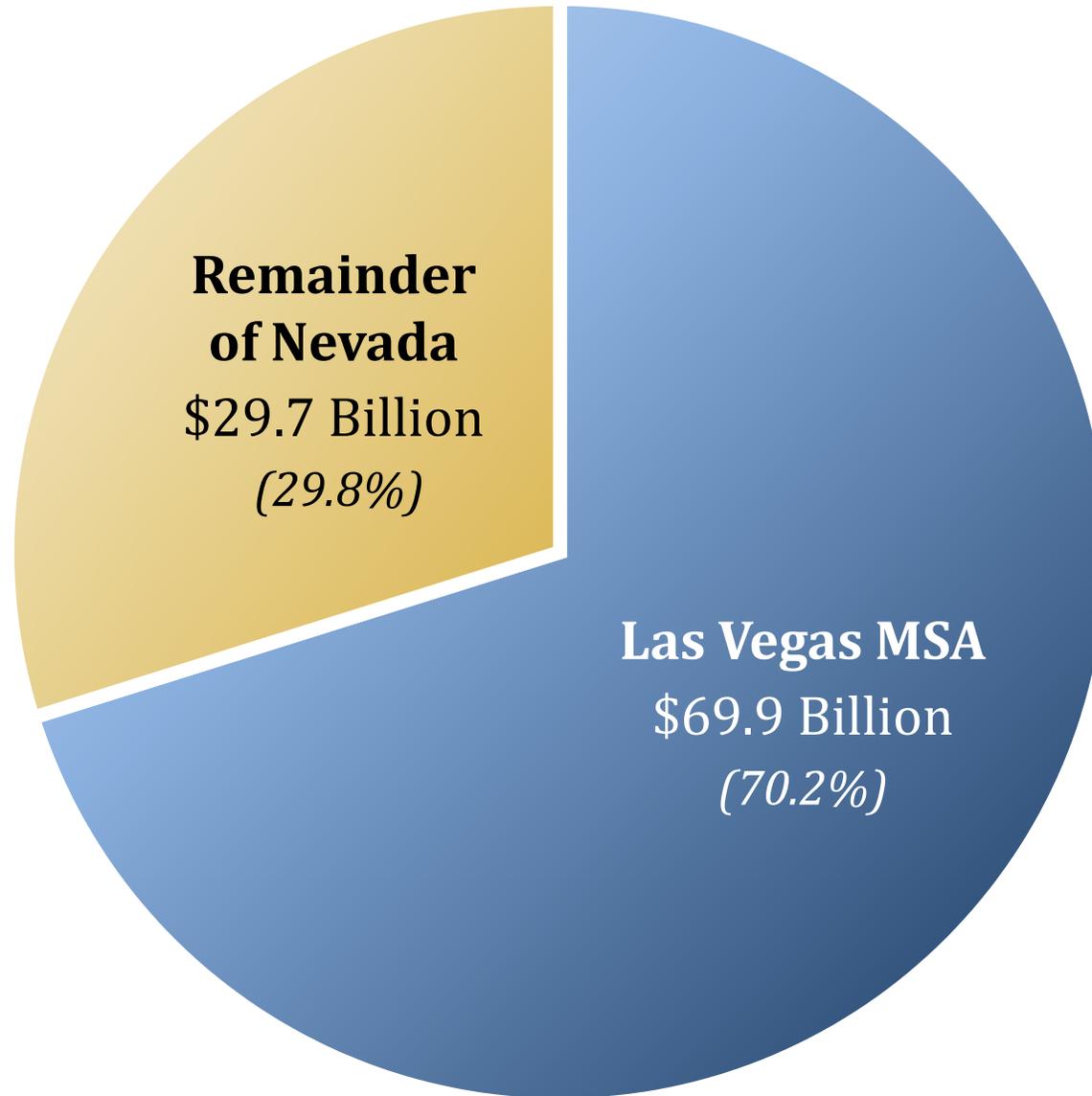
Gross Domestic Product (2009)

Source: U.S. Bureau of Economic Analysis



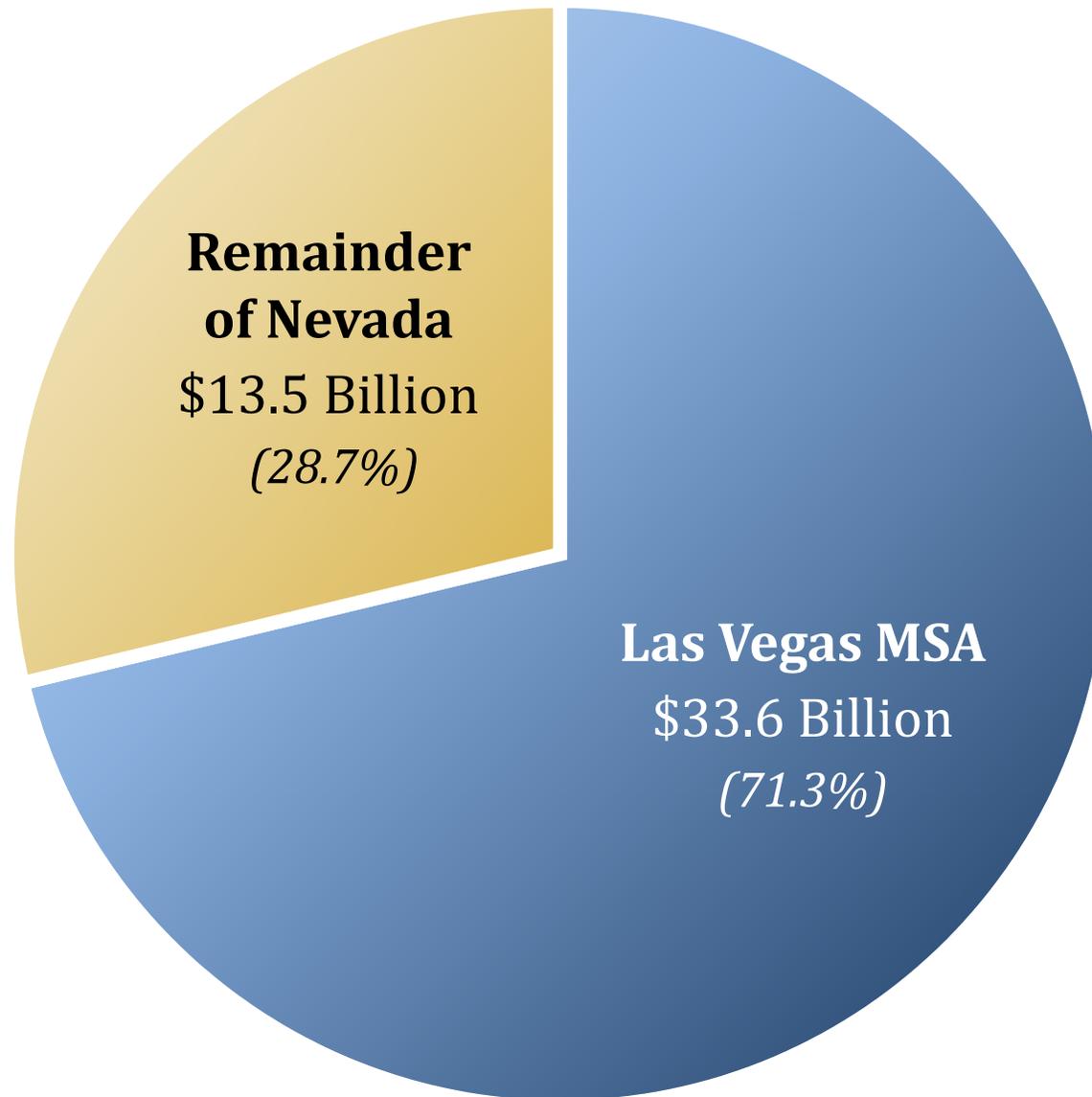
Personal Income (2009)

Source: U.S. Bureau of Economic Analysis



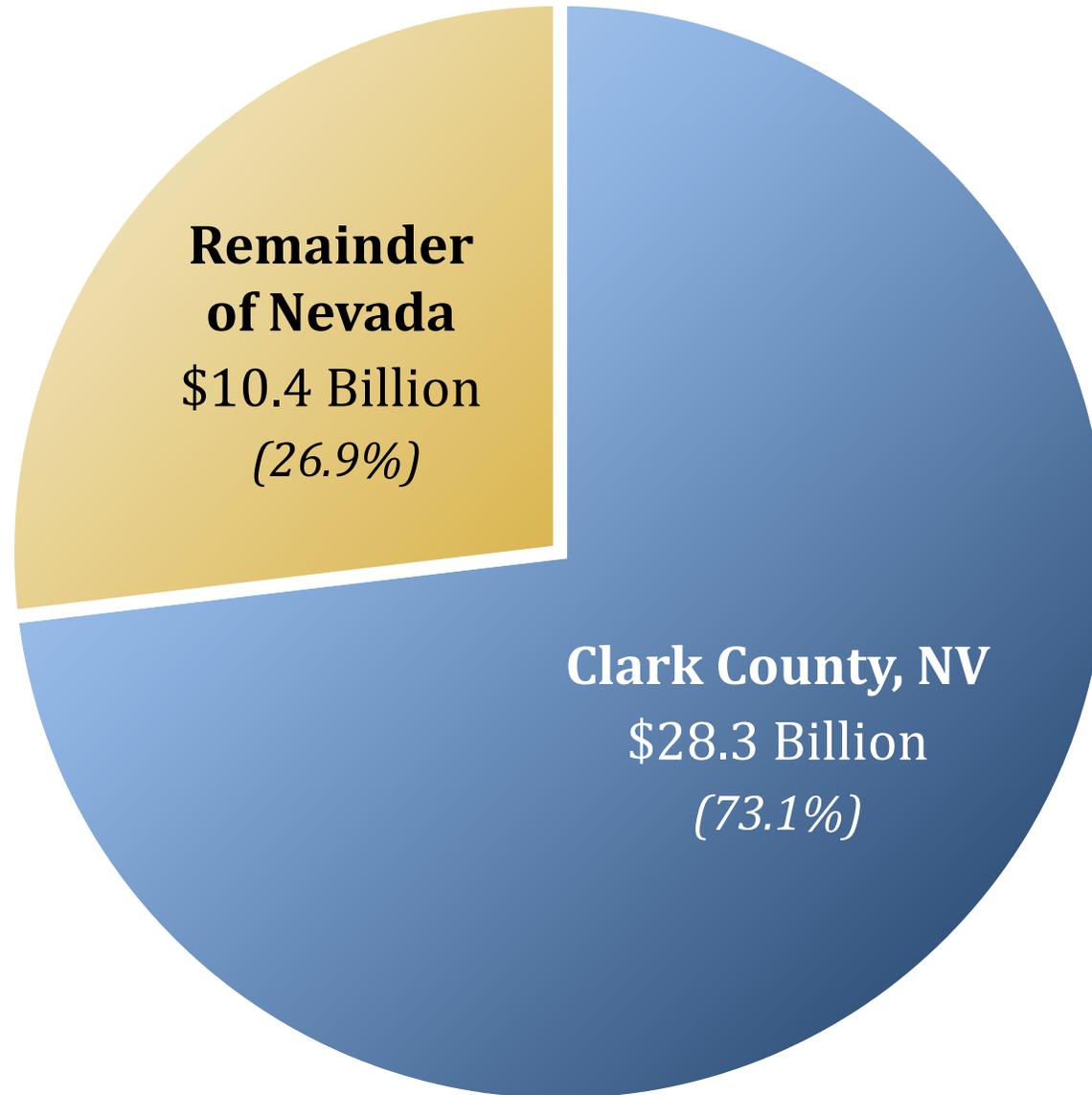
Wages and Salaries (2010)

Source: Nevada Department of Employment, Training and Rehabilitation



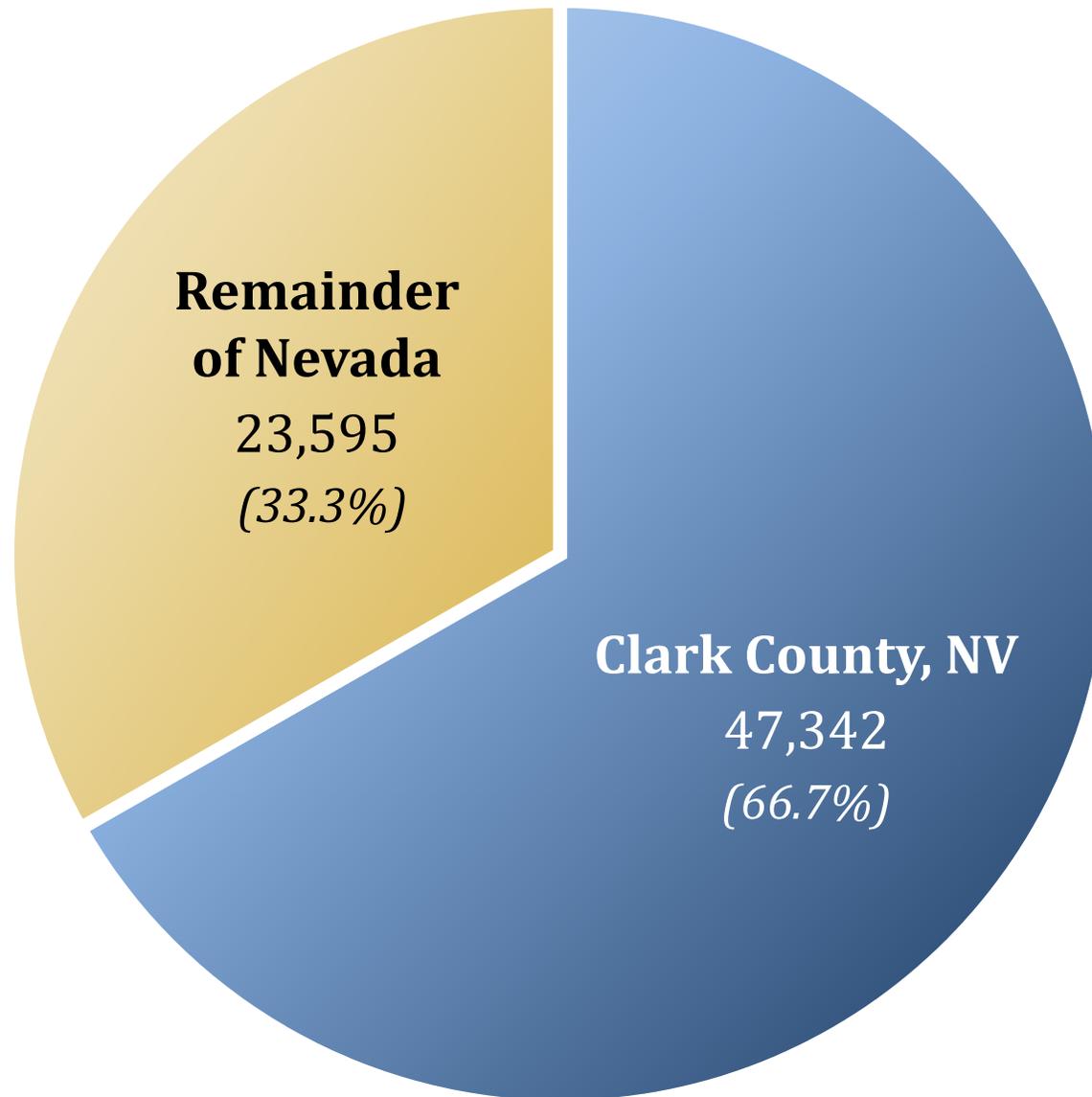
Taxable Retail Sales (2010)

Source: Nevada Department of Taxation



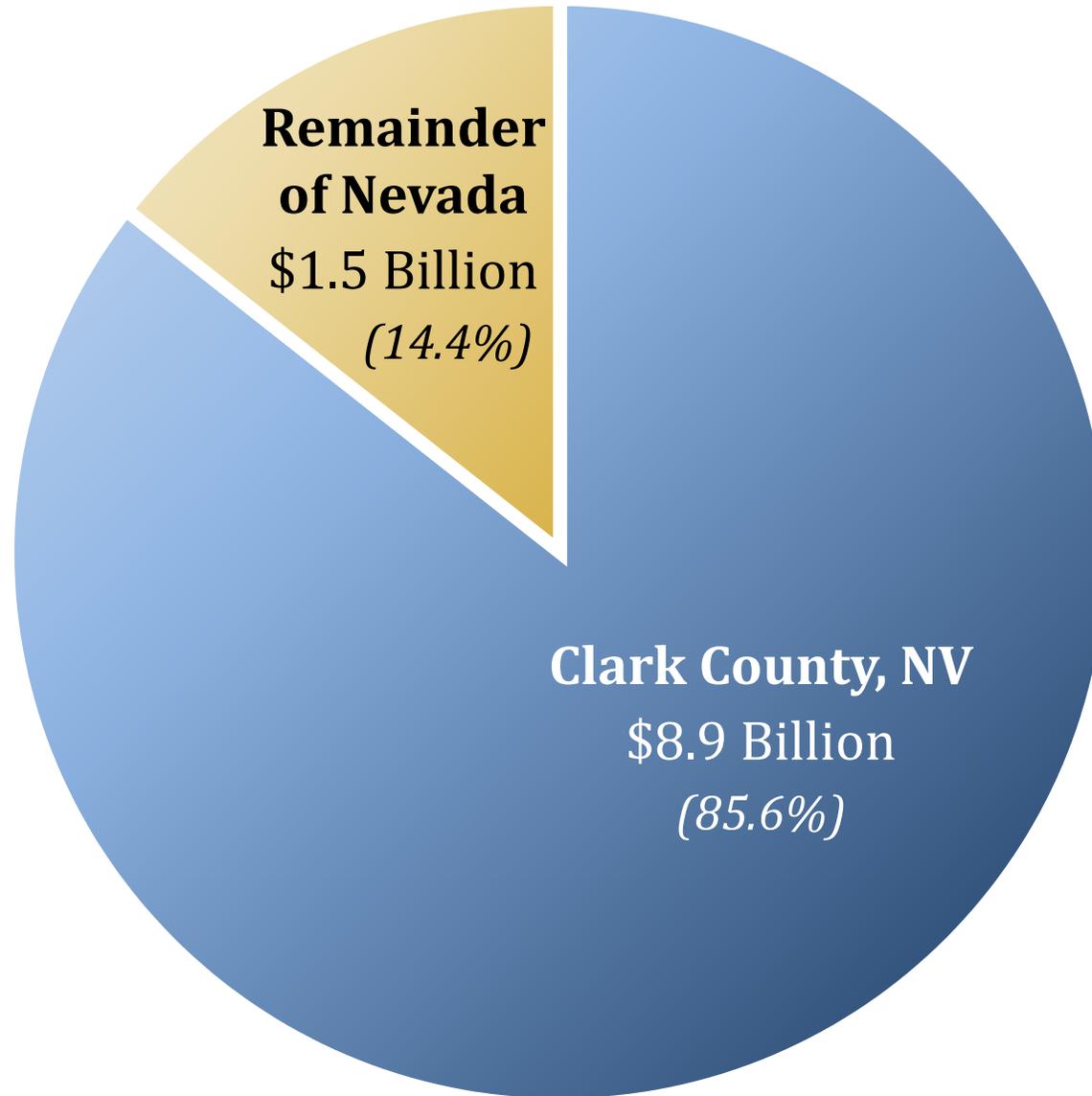
Private Sector Establishments (2010)

Source: Nevada Department of Employment, Training and Rehabilitation



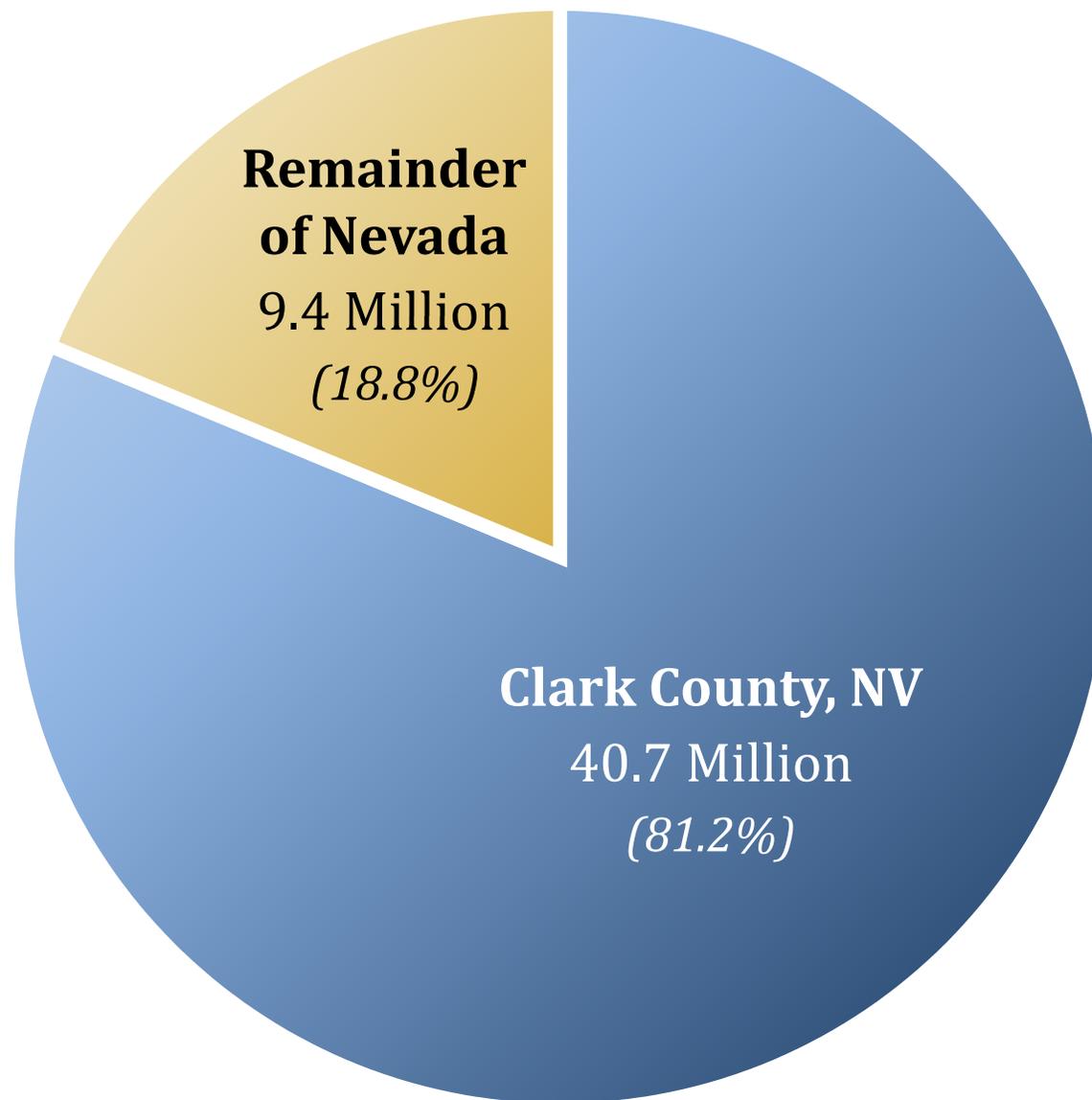
Gross Gaming Revenues (2010)

Source: Nevada Gaming Control Board



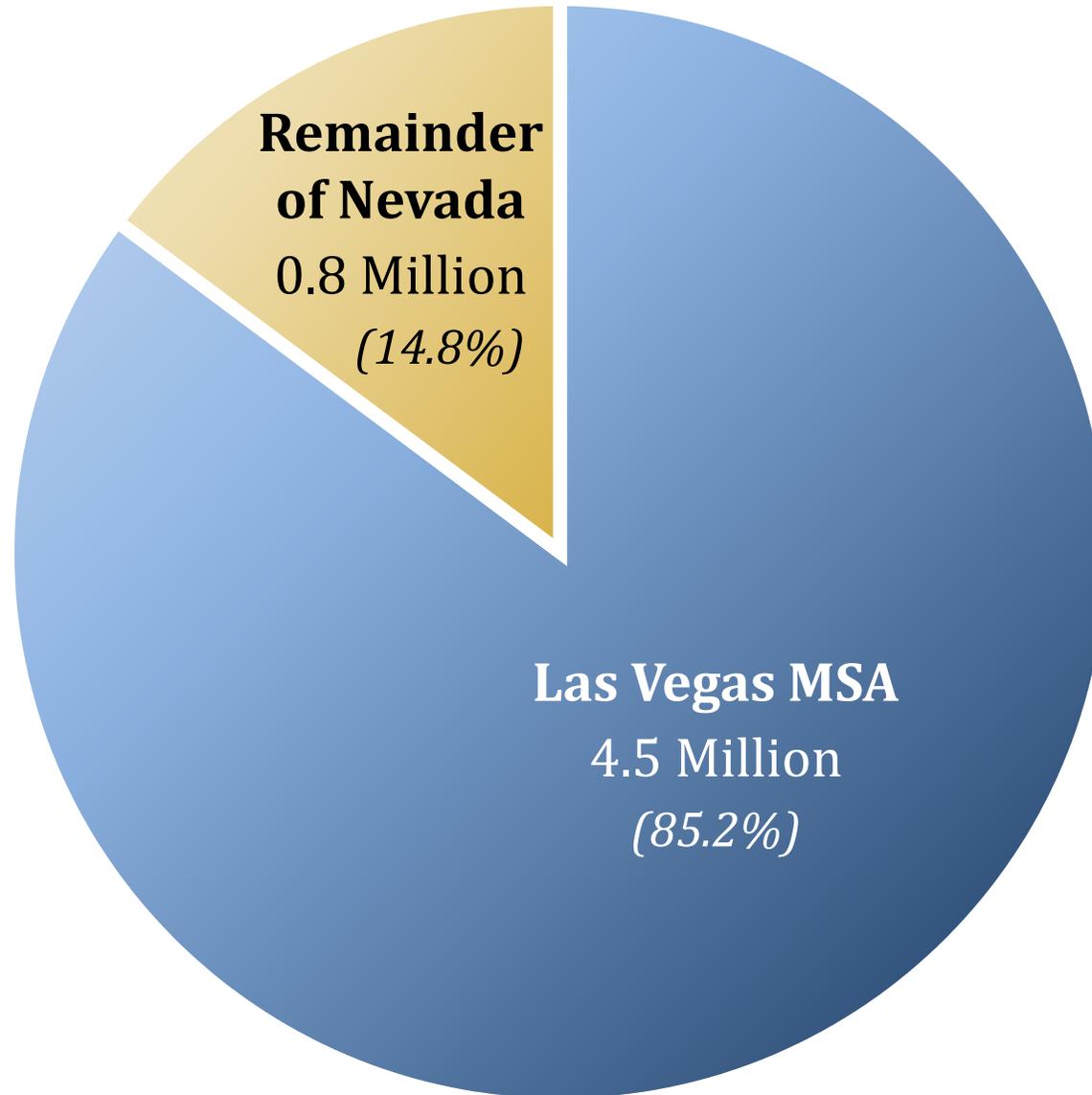
Visitor Volume (2010)

Source: Nevada Commission on Tourism; UNLV CBER



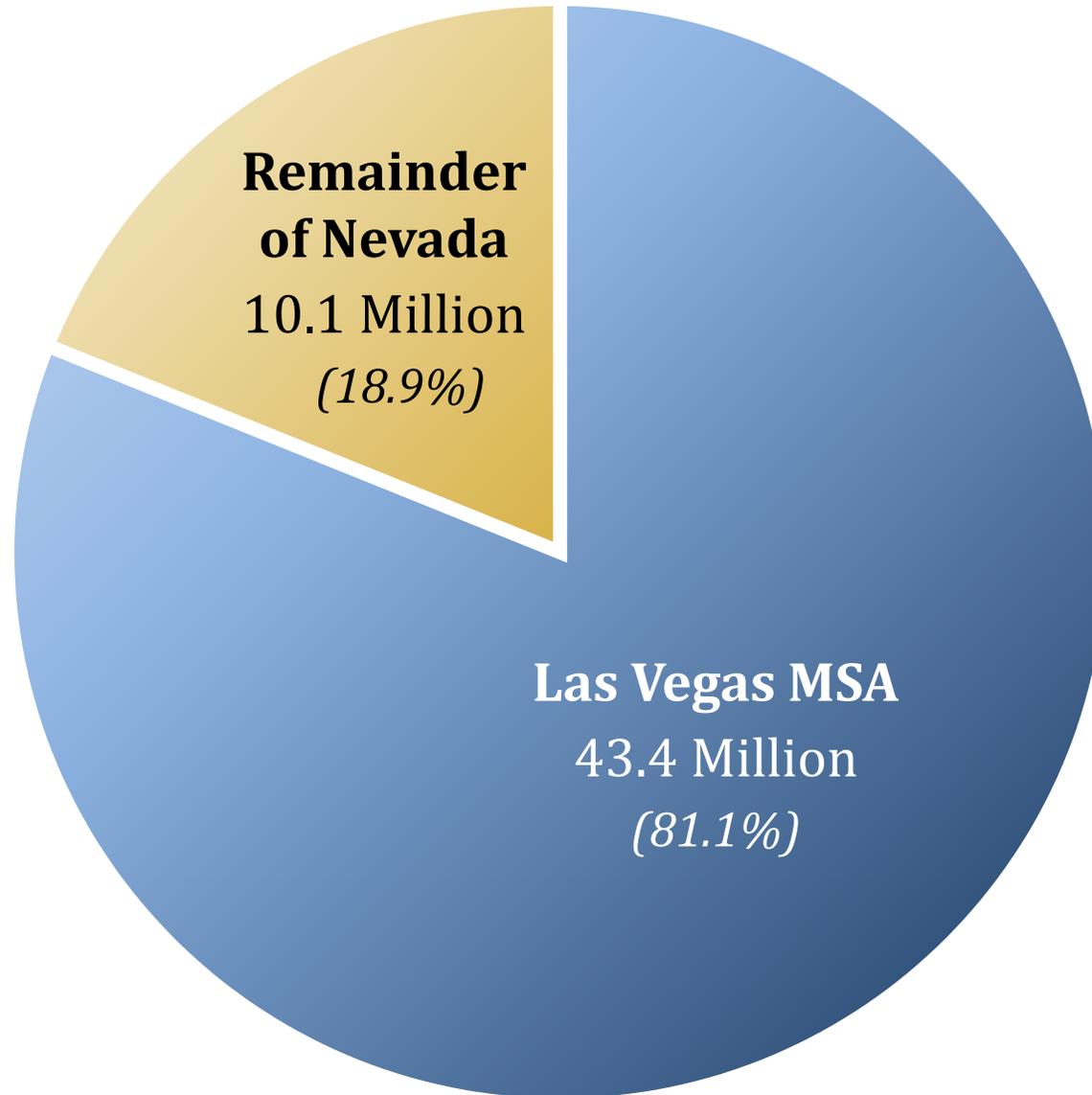
Convention Attendance (2010)

Source: Nevada Commission on Tourism; LVCVA



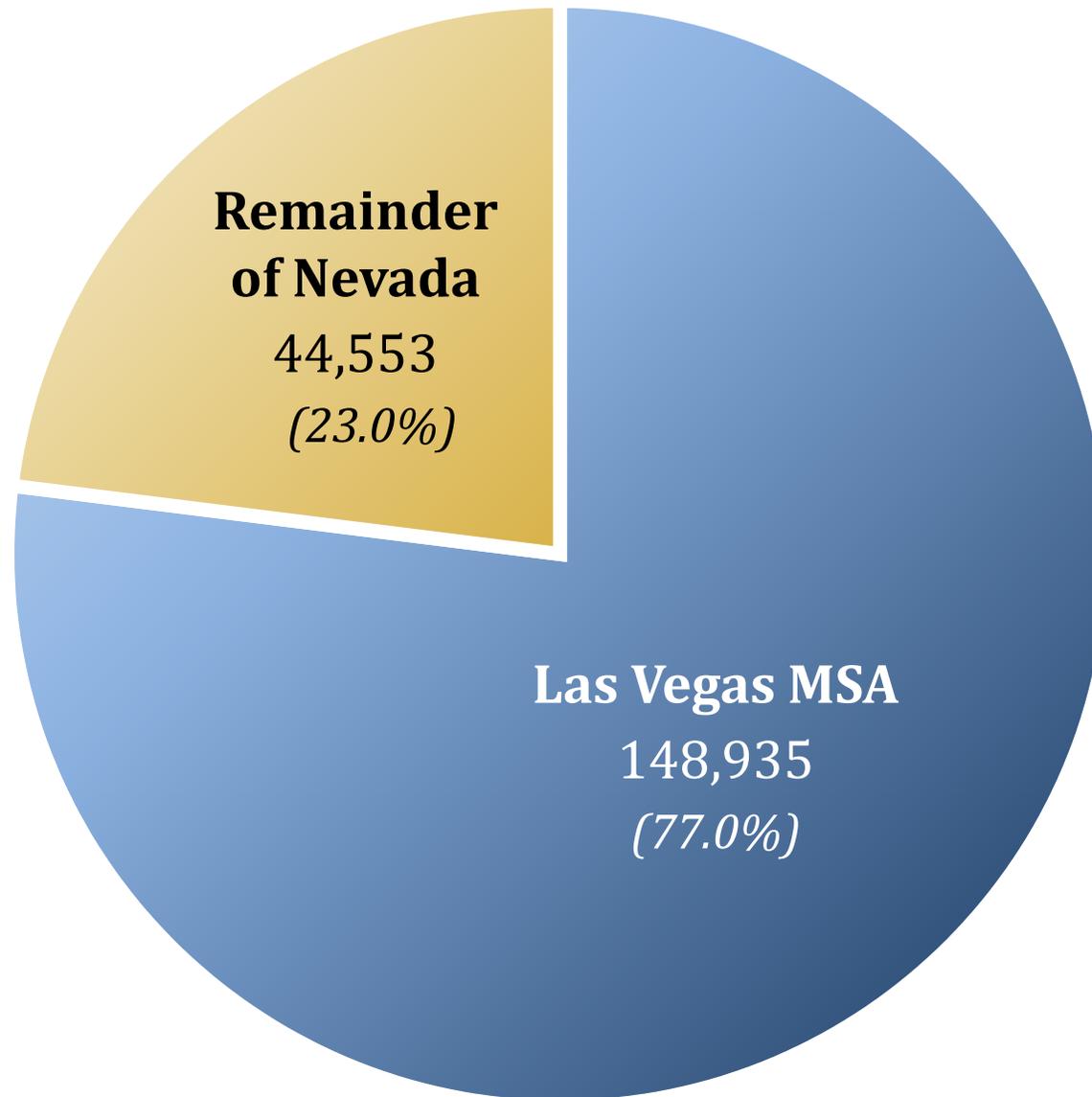
Room Nights Occupied (2010)

Source: Nevada Commission on Tourism; LVCVA



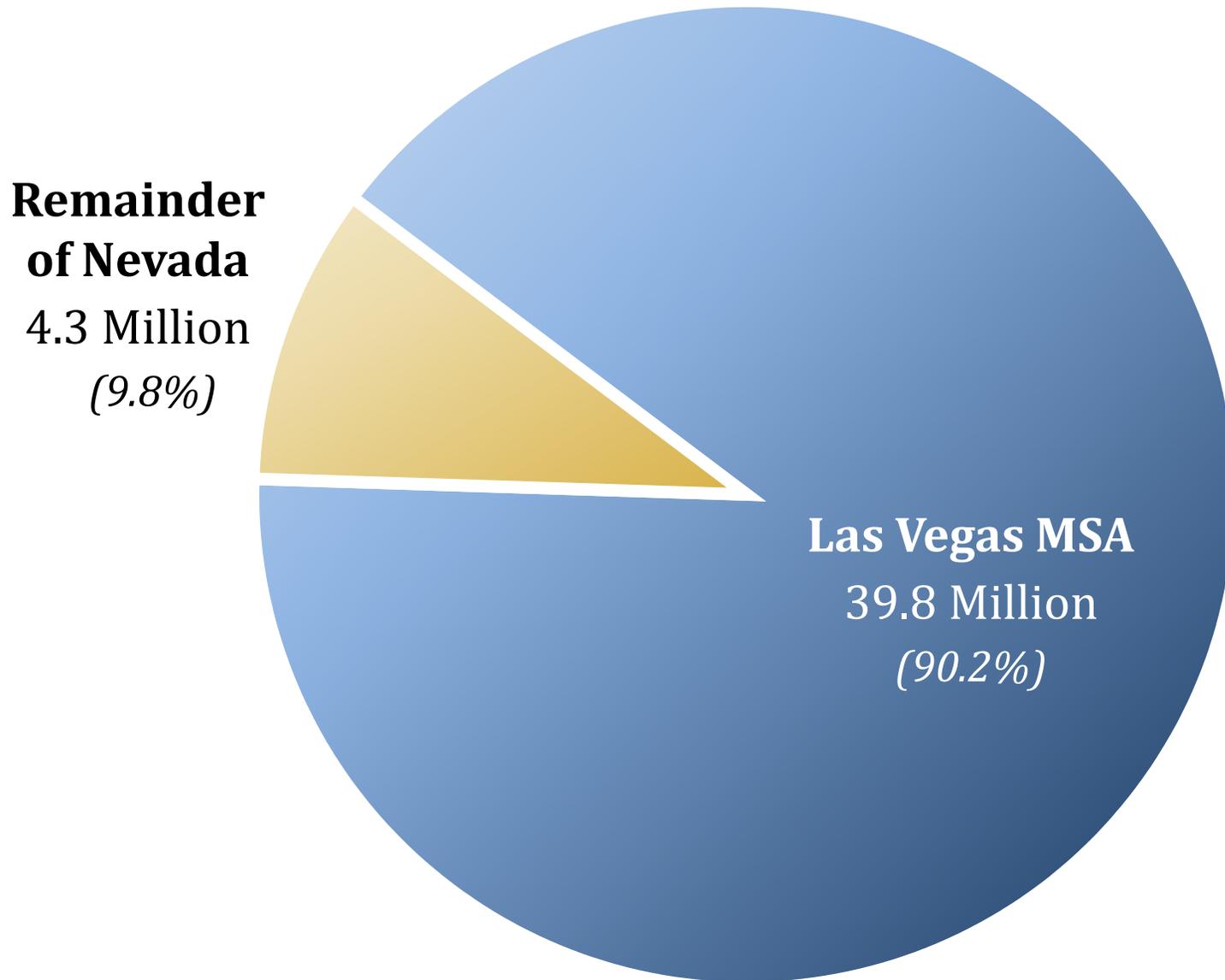
Hotel/Motel Room Inventory (Dec-10)

Source: Nevada Commission on Tourism; LVCVA



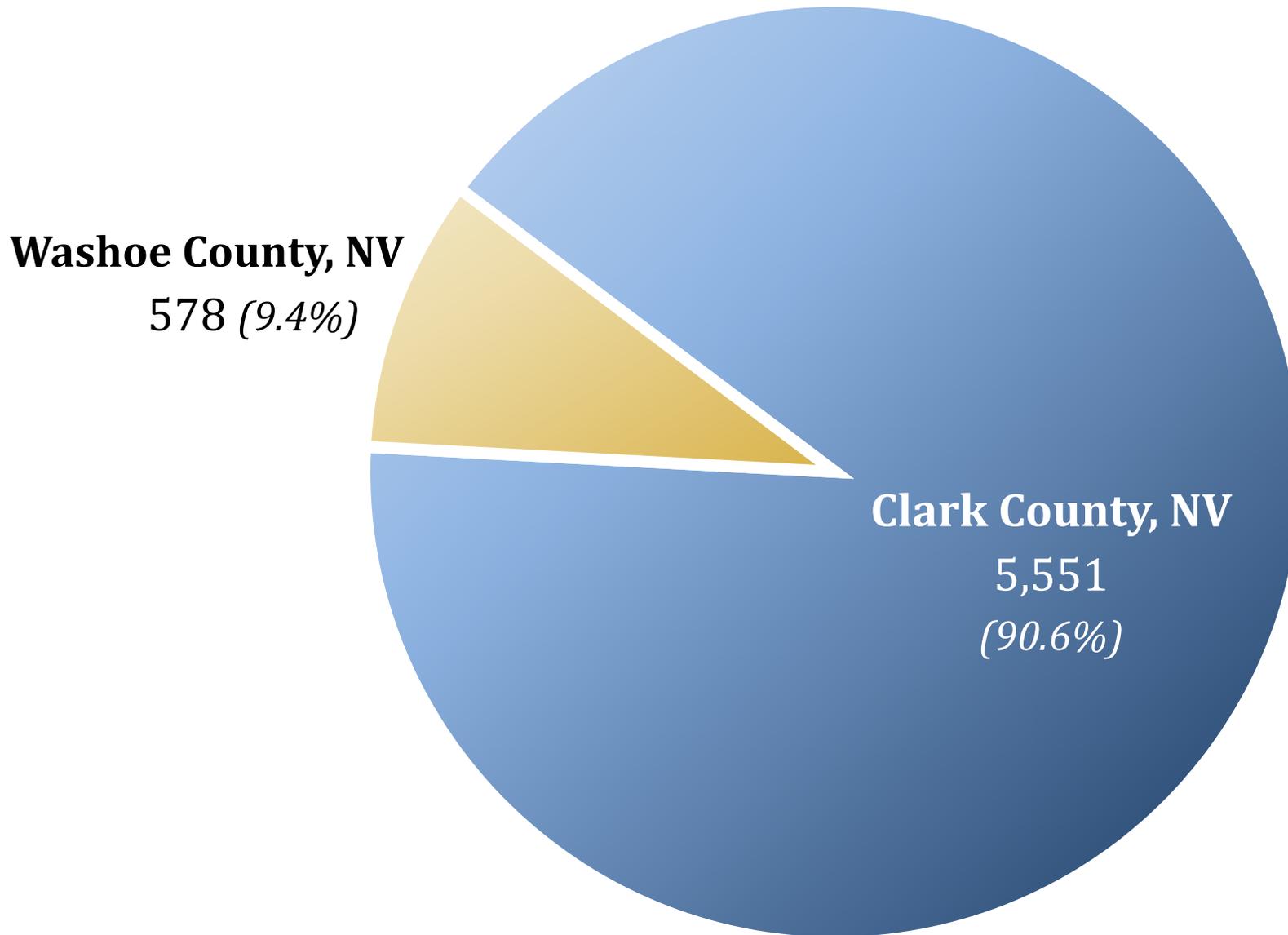
Airport Passenger Volume (2010)

Source: Nevada Commission on Tourism; McCarran Int'l Airport



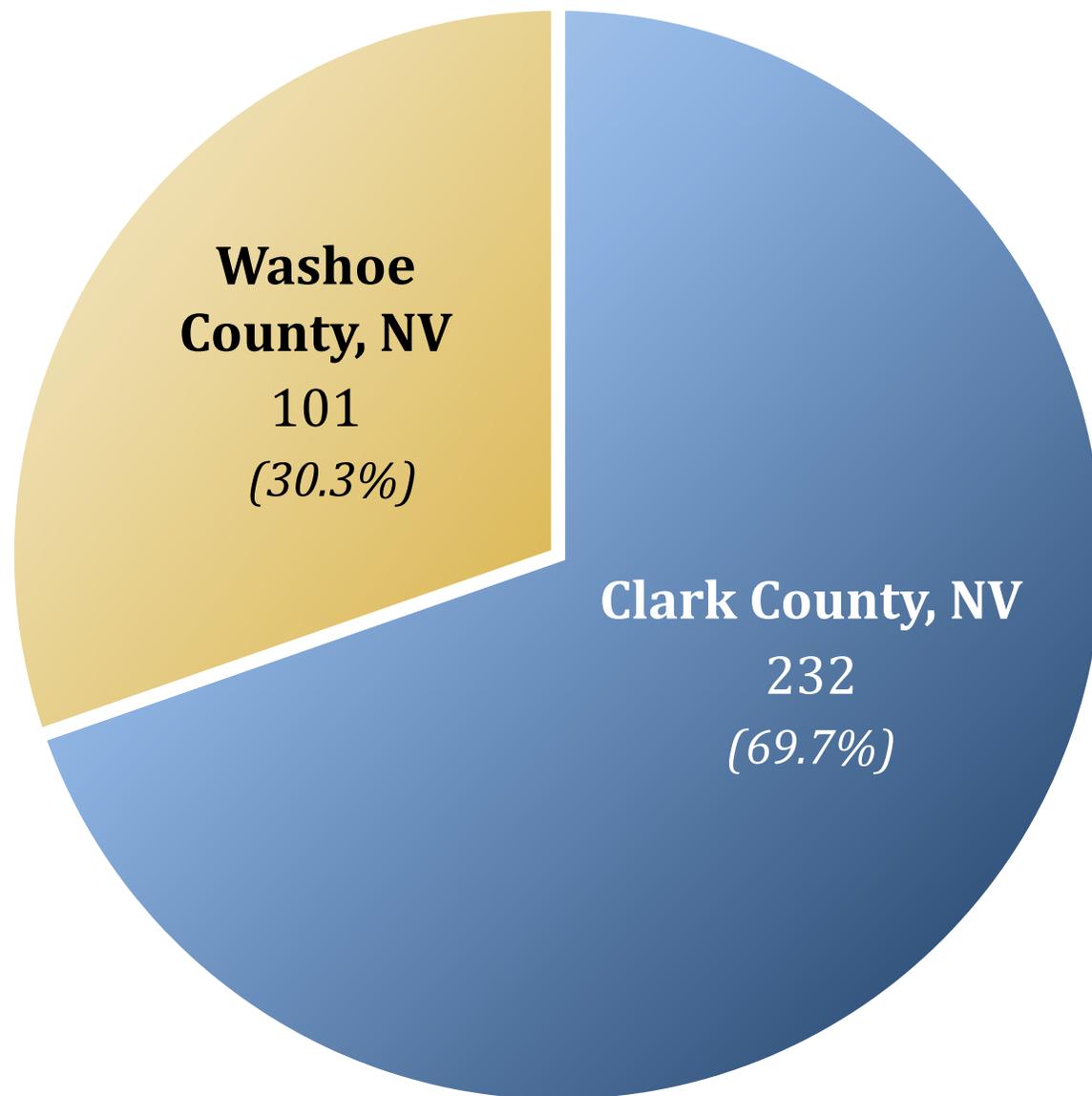
Residential Housing Units Permitted (2010)

Source: Various Building Departments



Commercial Buildings Permitted (2010)

Source: Various Building Departments



Existing Home Sales (2010)

Source: National Association of REALTORS; SalesTraq

