A STRATEGIC ANALYSIS OF SOUTHERN NEVADA'S ECONOMY:
IMPLICATIONS OF INDUSTRIAL LAND CONSTRAINTS FOR REGIONAL GROWTH & INCOME

January 2009

Prepared for:

NAIOP
COMMERCIAL REAL ESTATE DEVELOPMENT ASSOCIATION
SOUTHERN NEVADA CHAPTER

Prepared by the:

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THEODORE ROOSEVELT INSTITUTE

January 1, 2009

Mr. Ralph Murphy
Chair
Land Study Committee
Southern Nevada Chapter
NAIOP

Re: Implications of Industrial Land Constraints for Regional Growth and Income ("the Study")

Dear Ralph:

The Theodore Roosevelt Institute LLC ("TRI") is pleased to submit this analysis to the Southern Nevada Chapter of NAIOP relative to the implications of industrial land constraints on Southern Nevada.

TRI used a proven analytical approach for estimating the potential economic impacts of these constraints. More importantly, our basic methodology mirrors an accepted approach by local governments in Southern Nevada and the Southern Nevada Regional Planning Coalition ("SNRPC").

The study consists of an executive summary and six sections as included in the attached report. It presents important new findings on the industrial land issue facing Southern Nevada.

Standard Assumptions

This work scope was performed according to the *"Standard Assumptions & Limiting Conditions"* detailed in the original proposal.

Use & Nature of Report & Methodologies

The distribution of the Study is limited to the Client. If the Client intends to reproduce and distribute the Study and report, it must be reproduced in its entirety.

The Study is in the form of a narrative presentation, along with any appropriate tables, graphs and maps. TRI is not responsible for statements or interpretations made by the Client relating to the Study.

If you have any questions, please contact Alan Schlottmann at 702-860-7947. Thank you for giving us the opportunity to work on this research project.

Regards,

Theodore Roosevelt Institute

Theodore Roosevelt Institute, LLC

Attachment

Acknowledgements
NAIOP Report Steering Committee

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Sallie Doebler	Michael Newman
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Kevin Higgins	John Ramous
Rod Martin	John Restrepo
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EXECUTIVE SUMMARY

This report was designed by NAIOP (The Commercial Real Estate Development Association) to address two specific issues of concern for Southern Nevada: 1) the relatively high (land-driven) location costs and 2) the relatively scarce acreage for warehousing/distribution facilities in Southern Nevada compared to its primary competitor metro areas like Phoenix. The study focused upon two key issues:

- What, if anything, could create a competitive advantage for Southern Nevada in the Southwest large–scale warehouse/distribution center market?

- If such a viable sector is not imminent, what are the implications for the long-term sustainability of the Southern Nevada economy?

This report found that there are significant future impacts on the health of Southern Nevada's economy due to potential limitations on the region's goods distribution sector. The research clearly shows that a shortage of properly sized (10+ acres) parcels could significantly harm the growth potential of Southern Nevada's economy in the future. Despite the current recession, substantial industrial land shortages in Southern Nevada will continue to lead to relatively higher land prices putting the region at a competitive disadvantage compared to other Southwest metro areas.

The fundamental problem for Southern Nevada is that the scarcity of appropriate sized parcels for large scale distribution or manufacturing operations, at competitive prices, will impede the region's future economic growth and diversification.

The data on land and the number of parcels presented in Chapter V of this report clearly illustrate the scarcity of large industrial land parcel sizes to develop larger warehousing and distribution centers. Although the data represent a broader ranging of zoning categories than for just warehousing and distribution, they clearly illustrate the scarcity issue relative to larger parcel sizes of industrial land.

This report finds that this singular disadvantage could be mitigated ***if and only if*** adequately sized parcels are made available for warehouse and distribution uses, and more appropriate companies are effectively targeted by Southern Nevada's economic development efforts.

The examples presented in this report illustrate the essential linkage between economic diversification/development and the availability of warehousing and distribution facilities in Southern Nevada. Lower land prices (which represent approximately 33% of the costs of warehouse construction) certainly lower lease rates per square foot. However, what is also needed is the concurrent stimulation of the manufacturing sector (i.e., value-added products) that also lowers inbound freight charges and dramatically enhances Southern Nevada's competitive position.

This is due the fact that relatively small but higher transportation and warehousing costs in Southern Nevada compared do our major competitors will lead to cumulative negative impacts that could significantly harm our economy in the future. In other words, this regional cost disadvantage in goods distribution will harm the trajectory of economic growth, diversification and development in our region.

As has been recently recognized in Southern Nevada through the research activities of the Southern Nevada Regional Planning Coalition ("SNRPC"), the role of warehousing and regional distribution is critical to the concept of supplier linkages in industry location decision-making. These linkages are integral to the issue of the final cost of delivered goods. For example, the region's forecasted population growth will result in the "law of large numbers" whereby a local location would be more desirable than shipping to Southern Nevada from elsewhere. This reflects the economies of scale inherent in activities, such as prepared food and beverage manufacturing; and why having sufficient warehousing capacity is so important for Southern Nevada continued prosperity.

For the last several years, NAIOP has often expressed concern about the future health of Southern Nevada's economy, because of the potential lack of warehousing and distribution space resulting from a shortage of industrial land. Thus, what would happen to "normal" trajectory of economic growth in Southern Nevada if the region maintains a "tunnel-vision

focus" on land for residential development at the expense of land for the warehousing and distribution of goods to meet our local needs?

As an extreme example of the unappreciated role of warehousing and regional distribution facilities, consider the following: Assume that in the future, as the population of Southern Nevada reaches projections of three million persons, that most, if not all, groceries are delivered from outside the region, because of a lack of local warehouse and distribution space.

As shown below, currently, the most expensive major cities for a common comparative bundle of groceries in the Southwest are Los Angeles (an index of 111.4 as shown in the table below) and San Diego (an index of 112.7).

Cost of Living: Selected Cities: 2008 Groceries Index

City	Index
Phoenix, AZ	103.8
Los Angeles, CA	111.4
San Diego, CA	112.7
Denver, CO	104.7
Las Vegas, NV (Actual)	99
Las Vegas, NV (Non-local distribution calculation)	**112.4**

If a worst-case logistics "island" was to develop for Southern Nevada and grocery distribution and manufactured foods were "imported" from outside the region (not warehoused in the region), Las Vegas would be as expensive as Los Angeles and nearly as expensive as San Diego. It is critically important to note that prices in Los Angeles and San Diego already include a higher cost of electricity, higher workman's compensation, and a higher tax structure than implicitly included in Nevada prices. Even so, the impact of worst-case logistics costs swamps these other costs.

Many companies initially find Southern Nevada attractive as a potential warehouse and/or distribution center location due to its business-friendly environment, amenities, low taxes, large and "affordable" employment-base and access to large customer markets in Southern Nevada, Central Arizona, Southern Utah and most importantly, Southern California. Unfortunately, this

initial interest is too often mitigated by the relatively high price of land and the scarcity of appropriately sized parcels necessary for large-scale warehousing and distribution.

Consequently this report concludes that:

- The ability to locally manufacture/assemble products for local consumption and for export to Southern California and/or Phoenix dramatically and positively changes the calculus for distribution in Southern Nevada.

- Conceptually and positively, Southern Nevada does have the potential ability to act as a regional distribution center to all or a portion of the Southwest, assuming that appropriate sites are available that do not suffer "bottlenecks" relative to interstate access.

In *all* of the examples presented in this report, having commercial lease rates that are comparable to competitive areas, or having lease rate reductions combined with increased local production for regional export dramatically enhances Southern Nevada location for warehouse distribution facilities.

Finally, this report explored the potential negative impacts of the above factors on the regional economy of Southern Nevada. The potential impact of the cost disadvantages were modeled from 2012 to 2035. The three basic assumptions used were:

(1) The clear upward trend in logistics costs may trend to 16% -20% of gross product,

(2) Nevada fuel surcharges for basic haulage contracts continue at multiplier levels of 1.37 surcharges or will fall to a previous high range of 1.31, and

(3) Land restrictions result in an inability to have viable regional distribution facilities in Southern Nevada.

Under these assumptions, our research suggests that there is a potential 5% increase cost disadvantage for Southern Nevada relative to national norms.[1] A cost range of possible disadvantages from 3%-7% with a possible 10% upper figure are also shown for illustrative purposes.

At first glance it may appear that 5% is not a "large" percentage disadvantage. Thus, does this level of disadvantage really matter to Southern Nevada since it doesn't appear to be large? In simple terms, 3%-7% or, even 10%, seems to be relatively small? How would these cost differences impact the assumed base-case where Southern Nevada mirrors the national economy?

Details of TRI's economic model results are presented in this report in a series of tables and graphs. The focus was on five economic variables as measures of the future sustainability of the Southern Nevada economy:

1. Employment
2. Population
3. Per Capita Income
4. Manufacturing Employment
5. Scientific Professional Employment (Life sciences, physical scientist, etc.)

In summary, there are several major implications for Southern Nevada's economic future resulting from our findings:

- While regional distribution (warehousing and transportation) is rarely seen as an "exciting" economic topic compared to sectors, such as biotechnology, a lack of competitive facilities will generate major negative impacts on employment and per capita income in Southern Nevada in the future.

- All of the five Southern Nevada economic indicators analyzed in this report will, unfortunately, be significantly and negatively impacted by a scarcity of these facilities.

[1] *Other assumptions follow the discussions in Section I and Section V of this report.*

- The declines. over time, on employment and per capita income growth are significant (15%-20%) compared to the base-forecasts, and are generated by relatively small cost disadvantages (such as 5%-7%).

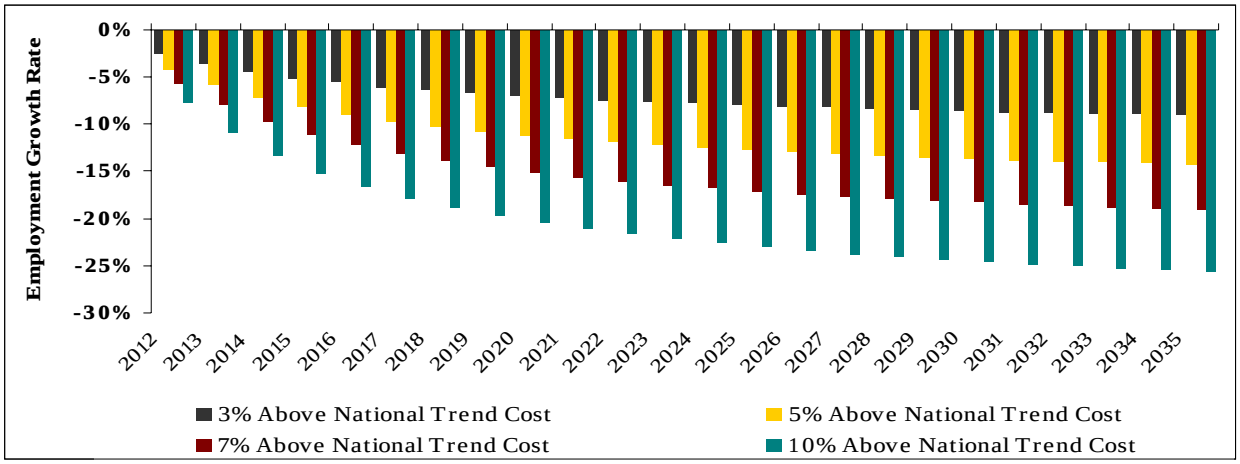
- The projected negative impacts on expected per capita income are also source of serious concern to NAIOP, because of their effect on the quality of life of residents and the attraction of companies and workers to Southern Nevada.

- The manufacturing sector (and, thus, future economic diversification/development) suffers major shortfalls in projected employment gains over the forecast period.

- The cumulative negative impacts of noncompetitive logistics situation in Southern Nevada far exceed direct estimates of the region's cost disadvantages.

Illustrative of these impacts, is the long-term effect on Southern Nevada's future employment picture assuming a "normal" regional cost structure for Southern Nevada graphically shown below. The chart clearly illustrates that, if Southern Nevada would sustain costs for delivered good at levels 5% above the national average, over time, the rate of employment growth would ultimately be reduced by 15% from the expected normal cost trend.

Southern Nevada Warehousing and Distribution Cost Impact on Forecasted Total Employment Growth
3%, 5%, 7% and 10% Delivered Prices Above National Trend: 2012 - 2035
Percentage Reductions to Forecast of Total Employment under Normal Cost Trend



This certainly would potentially and severely impact the long-term health of our economy, making the issue of having a sufficient number of properly sized (10+ acres) parcels critically important to our community today and tomorrow.

The scope of this study purposely was limited to understanding the economic implications for the economy of Southern Nevada of the limited supply of affordable and properly sized parcels for industrial development. Recommendations for mitigating the findings contained herein are not provided as part of this report. Nevertheless, in the next several years, NAIOP will be working with public officials at all levels of government to explore its suggestions for addressing these issues.

REPORT DISCLAIMER: APEX

Research for this study was substantially completed in mid 2008, before the extent of the economic recession was fully appreciated. While economic conditions have changed significantly, the impact upon employment, rental rates and similar data are generally consistent across all southwestern markets. While the specific figures contained in this study may no longer reflect current conditions, the relative comparisons between the various markets remain substantially the same.

This study was commissioned to better understand the long term future for economic growth of the area considering existing land constraints and regional economic conditions. In this regard, the study focused upon land availability within the Land Disposal Boundary created by the Southern Nevada Public Land Management Act. Federal land within this Boundary is administered by the United States Department of the Interior, Bureau of Land Management.

Recently, the City of North Las Vegas has annexed portions of the area northeast of the Las Vegas Valley generally referred to as "APEX." This action may accelerate the development of property in this area. While this may have some limited impact, the general trends and conclusions of this study are still valid. The majority of APEX is located outside the Land Disposal Boundary and development of this area is not absolutely correlated with available sites within the "Boundary" for a number of reasons.

For example, Apex may not be suitable for certain users, because it is outside the radius defined by the 10-hour round trip drive time from the Ports of Los Angeles and Long Beach, and requires freight to move through the gaming corridor to get to the site. In addition, because residential development is precluded near Apex, proximity to available residential areas and, consequently, labor sources presents some limitations. Finally, substantial infrastructure improvements remain to be completed before the scale of Apex's development can have a meaningful impact upon the fundamental findings of this study.

SECTION I

INTRODUCTION

I. INTRODUCTION

This report presents an analysis of the potential impacts on the development and diversification of Southern Nevada's economy due to possible limitations on the goods distribution sector in our region. As presented herein, relatively small competitive disadvantages in the delivered prices of goods will lead to cumulative negative impacts that significantly affect the economy and quality of life of Southern Nevada.

The potential negative impacts on Southern Nevada stemming from a regional cost disadvantage in goods distribution are severe and significantly harm the trajectory of growth in the region. Our findings strongly indicate that the cumulative impacts of what appear to be small cost disadvantages result in major negative regional economic impacts.

As has been recently recognized through the research of the Southern Nevada Regional Planning Coalition ("SNRPC"), the role of warehousing and regional distribution has often been overlooked and underappreciated. This role is particularly true, because of important supplier linkages in industry location decision-making and the future of economic development in our community. These linkages are integral to the issue of the final cost of delivered goods.

For example, Nevada's forecasted population increases will result in the "law of large numbers" where a local location would be expected to be desirable compared to shipping to Nevada from elsewhere [such as with a bottling plant]. This reflects the economies of scale inherent in such activities, such as prepared food and beverage manufacturing.

NAIOP has a keen interest in highlighting issues that impede Southern Nevada's future regional economic success, such as the lack of appreciation of the role of warehousing and regional distribution facilities noted above.

In this report, the specific issue of concern is the comparative (land-price driven) location costs for warehousing/distribution in Nevada relative to alternatives, such as a Phoenix-area location. In other words - What is the Southern Nevada competitive position in the context of relative land costs?

Selection of a location for a regional manufacturing and/or distribution center is typically based on several selection criteria. These may include: access to customers, customer needs, land prices and availability, zoning restrictions, interstate access, rail access, overall logistics costs, and employee costs.

As noted, this report focuses on one aspect of the location selection process: lease rates and the implicit role of land prices.

As an example of the important role of warehousing and regional distribution facilities to the long-term economic sustainability of Southern Nevada, assume that in the future, as the population of Southern Nevada reaches 3,000,000, groceries are delivered from outside the region, because of a lack of local warehouse and distribution facility capacity.

The table below presents grocery cost data for several major metropolitan areas, based on the underlying individual grocery items included in the well-known ACCRA price database.[1] Currently, as shown, the most expensive major cities for a common comparative bundle of groceries in the Southwest are Los Angeles (an index of 111.4 as shown in the table below) and San Diego (an index of 112.7).[2] Using a methodology that assumes, solely for illustrative purposes, that all groceries, in terms of manufactured foods and distribution, were non-local, Las Vegas would become more expensive as a major city in the Southwest for these groceries than Los Angeles and even comparable to San Diego.[3] It is critically important to note that prices in Los Angeles and San Diego already include a higher cost of electricity, higher workman's compensation, and a higher tax structure than are implicitly included in Nevada prices. Even so, the impact of worst-case logistics costs significantly exceeds these other costs.

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[1] *The ACCRA, data which forms the ACCRA cost index is recognized as a major source of metropolitan data. The data is explained in more detail at the website of the Council for Community and Economic Research (http://www.coli.org/). The proprietary grocery data above was obtained directly from ACCRA as 2008, First Quarter, Grocery Items Sub-index, Total Composite Index.*

[2] *We assume changes in absolute price levels but not changes in relative prices between areas. Current fuel surcharges to truck transport (July 2008) have risen to a factor of 1.37 in the California-Nevada zones.*

[3] *The implicit change in the index for Las Vegas is 13.5%. This figure is obtained through applying the transportation coefficients in the IMPLAN model as explicitly becoming non-local deliveries (http://www.implan.com/), utilizing an average distance from Los Angeles–Long Beach and Phoenix, applying projected per mile costs in "Projecting Per Mile Costs of Operating Automobiles and Trucks to 2019", Department of Transportation which, in addition, are then adjusted by current fuel prices from ProMiles, see: http://www.etrucker.com/apps/promiles/fuelprices.asp and a general inflation index. Current fuel surcharges are used in the California-Nevada zones of 1.37.*

Exhibit I-1
Cost of Living: Selected Cities: 2008 Groceries Index

City	Index
Phoenix, AZ	103.8
Los Angeles, CA	111.4
San Diego, CA	112.7
Denver, CO	104.7
Las Vegas, NV (Actual)	99
Las Vegas, NV (Non-local distribution calculation)	112.4

Source: Council for Community and Economic Research.

The remainder of this report is presented as follows. The next section, Section II contains background information on national trends is presented that relate to Southern Nevada. Section III is an overview and emerging issues for Southern Nevada freight movement. Section IV addresses the fundamental question of our competitive position in retail distribution. Section V provides perspective on issues related to developable land availability in Southern Nevada. Section VI formally models the potential impacts on the Southern Nevada economy of competitive cost disadvantages for goods distribution. Section VII includes the conclusions of our research.

SECTION II

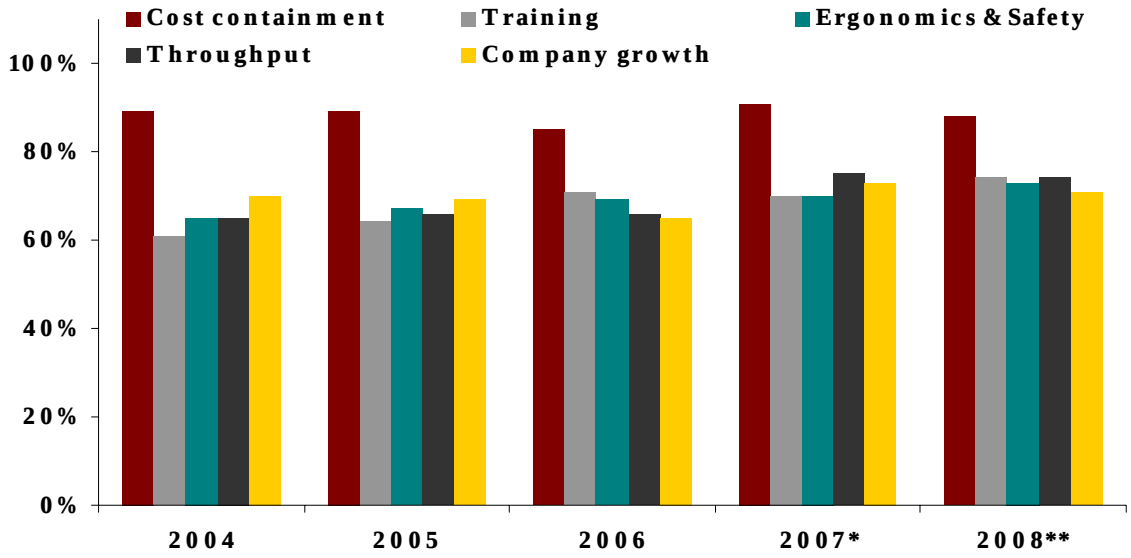
NATIONAL TRENDS

II. NATIONAL TRENDS

This section reviews selected national data and trends relevant to warehousing and distribution in Southern Nevada.

The 2007 annual warehousing and distribution survey by *Modern Materials Handling* reconfirms the primary market and cost considerations impacting warehousing and distribution.[1] As shown below, in addition to personnel issues, major regional market concerns in warehousing and distribution continue to be cost containment and a location that allows maximum inventory "turns" (throughput) as well as company growth.

Exhibit II-1
Major Regional Market Concerns in Distribution, Warehousing & Manufacturing: 2004 - 2008



**Projected by respondents in 2005.*
***Projected by respondents in 2006.*
Source: Modern Materials Handling, 2007 (online).

For five consecutive years, the major single issue, nationally, has been cost containment. It is interesting to note that this issue has driven national trends regarding the location of distribution centers that are consistent with NAIOP concerns for Southern Nevada.

[1] *See the online version at: http://www.mmh.com.*

Presented below is a discussion that reflects relevant trends. To summarize:

- Recent national location trends in major distribution centers are away from core metropolitan areas to outlying counties.

- With wage and tax structures similar in these areas, the two (interrelated) key factors leading to decentralization are, most likely, land price and large size acreage availability.

- The replacement of traditional warehouses with more sophisticated regional distribution centers has resulted in this dispersal away from centralized locations in metropolitan areas to (less populated) adjoining counties.

Based upon The Equal Opportunity Commission ("EEOC") EEO-1 reports, several interesting trends can be identified.[2] This is particularly true given the recent EEOC matching of part of its database (EEOC Special File) to U.S. Census data.[3] Due to the fact that some metropolitan areas are reported separately from the surrounding county areas, the following data at the county-level is subject to reporting limitations, but remains illustrative of recent trends.

The two tables below support the view that the dispersal of regional distribution centers is, as noted above, most likely a primary function of land cost and parcel size availability.

This conclusion is based on the observation that counties with the largest increases in the number of distribution facilities are generally contiguous to heavily metropolitan areas unless they are near highway junctions. However, these counties are not the county, which contains the metropolitan area itself. In other words, the state tax structure on profits and supplies is the same between counties, as well as workman's compensation and other regulations - the wage market is similar, etc. The only variables of difference are the availability of large parcel size and land costs (and quite possibly zoning).

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[2] The Equal Opportunity Commission (EEOC) maintains a database for nine major job categories as part of required employer filings. This does not include small warehouses, since they do not meet the employee-size reporting requirements, but does include larger distribution centers (generally greater than 250,000 square feet).
[3] The discussion and tables below are from the matched databases, as available, from EEOC; and reported as Retail Distribution Centers: How New Business Processes Impact Minority Labor Markets.

As shown in Exhibit II-2 below, counties, which contain some of the largest metropolitan areas in the nation, are having the largest decreases in the number of distribution centers. This is particularly true in California for Los Angeles and San Francisco. Interestingly, and of major interest to NAIOP: the counties having the largest increases in distribution centers are often counties contiguous to those having the declines.[4] Clearly, the California experience this includes San Bernardino and Riverside Counties.

Exhibit II-2
County Changes in Distribution Centers

19 Counties with Largest Increases		10 Counties with Largest Decreases	
Rank	**County**	**Rank**	**County**
1	Franklin, OH	1	Cook, IL
2	San Bernardino, CA	2	Los Angeles, CA
3	Riverside, CA	3	Hudson, NJ
4	Middlesex, NJ	4	Harris, TX
5	San Joaquin, CA	5	San Francisco, CA
6	Yolo, CA	6	Hennepin, MN
7	Du Page, IL	7	Oklahoma, OK
8	Harford, MD	8	Salt Lake , UT
9	Rutherford, TN	9	San Mateo, CA
10	Windham, CT	10	Denver, CO

Source: EEOC data compilations at EEOC website. Latest available data is from 2002 in Retail Distribution Centers: How New Business Processes Impact Minority Labor Markets.

Based on the EEOC data combined with population data, several large regional distribution centers with population estimates can be identified and are shown below.[5] As illustrated, the "place populations" are quite small compared to these large distribution centers. These data certainly appear to be consistent with the observations made above.

[4] *We remind the readers that, in our opinion, for some counties and metropolitan areas (as in Arizona), the data are intermingled. Thus, some specific counties may be omitted.*
[5] *The source is the same as noted in footnote 8.*

Exhibit II-3
Selected Large Distribution Centers Identifiable in EEOC Data & Place Population

Retailer	Location	Size Sq. Ft.	Place Pop.
Family Dollar	Morehead, KY	907 K	5,914
Michaels	Hazleton, PA	692 K	23,329
American Eagle	Ottawa, KS	400 K	11,921
Target	Midlothian, TX	1.35 M	7,480
Dollar Tree	Marietta, OK	603 K	2,445
Wal-Mart	Hopkinsville, KY	1.20 M	30,089
Sports Authority	McDonough, GA	300 K	8,493
Kohl's	Corsicana, TX	353 K	24,485
Lowes	Perris, CA	1.20 M	36,189
Best Buy	Dinuba, CA	635 K	16,844

Source: EEOC data, op. cit.

SECTION III

ISSUES FOR SOUTHERN NEVADA

III. ISSUES FOR SOUTHERN NEVADA

There are four issues for Southern Nevada concerning the future of warehousing and distribution. These four issues are: (1) Demographic trends, (2) Current types of goods shipments to the community, (3) Land prices and availability, and (4) Shipment trends by mode.

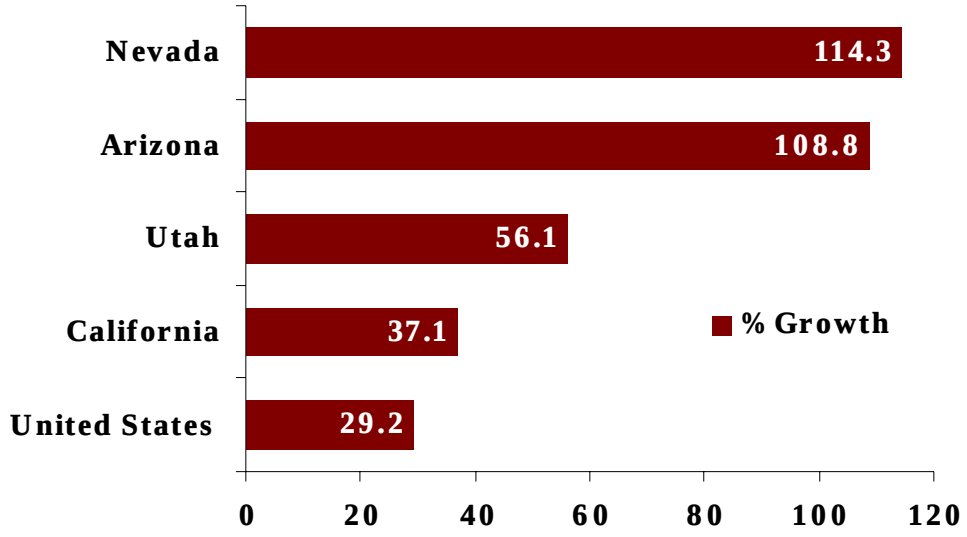
Each of these will be discussed in turn.

1. DEMOGRAPHICS

Basic population forecasts for both Nevada and the Southwest bode well for future distribution and warehouse demand in this "mega-region."

Our demographic analysis and those of other analysts strongly suggest that Nevada will continue to experience strong population growth. To summarize, the underlying demographic assumptions relevant to NAIOP suggest future population estimates consistent with regional and national population growth to 2030 as follows:

Exhibit III-1
Southwestern States & U.S. Projected Population Growth (%) to 2030



Source: TRI (2006) from U.S. Bureau of the Census.

It is important to note that the significant population growth forecasted for Southern Nevada has three critical interactions with future service provision and principles of business location decision-making.

Specifically, the demographic trends for Nevada (and Southern Nevada) have several important implications for business recruitment:

- Nevada's doubling of population will result in a "law of large numbers" whereby a local location will be more desirable compared to shipping ("importing') into Nevada from elsewhere [as note previously, a bottling plant]. This reflects the economies of scale inherent in prepared food and beverage manufacturing in a large region.

- The growth of Nevada's senior population needs to be recognized as it relates to growth in the provision of hospital and health relates services.

- Based on transportation network theory, firms committed to serving the Southwest [Southern California, Nevada, Arizona, and Utah] would have transportation incentives to consider a location in Southern Nevada under equivalent conditions. This is due to the role of Southern Nevada as a "transportation network focus," given road networks, differential population growth rates noted above, and accepted transportation modeling metrics used by location consultants.[1] As Southern Nevada's population grows relative to its neighboring states, there is an explicit "theoretical" incentive for a business location in Southern Nevada for servicing the multi-state mega-region. However, this assumes that cost conditions, goods availability and demand, etc. are the same across locations. It also reflects a purely spatial network decision to serve a multiple set of markets. We will return to this concept later in the report.

[1] *We have utilized these models in past work related to supermarket and other retail location.*

The current population parameters in the Southwest are shown in the table below.[2]

Exhibit III-2
Current Regional Population Estimates: 2007

Region	Population Estimate
Clark County	***1,997,000***
Maricopa County	3,880,000
Salt Lake County	1,051,000
Los Angeles County	10,276,000
Los Angeles	3,996,000
Southern California	20,000,000

Source: Various sources. See Footnote 2.

As is well known, the dominant retail market within our trading region is Southern California, due to primarily to the size of its population. However, as noted, Southern Nevada is well-positioned to serve the mega-region, based on existing transportation networks. The long-term question is: Under what circumstances can Southern Nevada exploit its business environment advantages to serve the large Southern California market? This question will be discussed later in this report.

2. CURRENT PATTERNS OF GOODS SHIPMENTS IN SOUTHERN NEVADA

Southern Nevada manufactures little of the products it uses. Accordingly, it relies on shipments from elsewhere in the country (or foreign imports via the ports of Southern California). With manufacturing jobs projections that represent only 3% of total employment in Southern Nevada, this is hardly surprising.[3]

A widely-used and accepted model for regional impact analysis is the IMPLAN model.[4] Based on model parameters for local versus external production of goods, the lack of local manufacturing

[2] *Figures are approximate for comparison purposes only and rounded to nearest thousand. Population estimates above are from a variety of sources. These include the new consensus population forecasts for Clark County recently adopted by SNRPC, and others are from U.S. Bureau of the Census for counties and metropolitan areas, as well as individual county data. Separate sources for the same county can vary the totals, but the comparison of magnitudes in the table above, appear consistent across sources.*
[3] *Two-year employment forecasts are available at the Nevada DETR (Department of employment and training) website. Much of our local manufacturing is oriented to the hospitality and entertainment sector, such as production of signage, etc.*
[4] *Details on the IMPLAN model are available at the website of the Minnesota IMPLAN Group (www.implan.com).*

of goods in Southern Nevada extends across most retail sectors. This is fairly obvious for food items, such as seafood or resource-based items, such as wood furniture. However, as shown in the table below, on net, Southern Nevada relies on "elsewhere" for most other manufactured goods as well.

Exhibit III-3
Selected Net Non-Local Goods to Southern Nevada

▪ Food manufacturing, general
▪ Soft drink manufacturing
▪ Snack food manufacturing
▪ Electronics manufacturing
▪ Medical apparatus manufacturing
▪ Instruments manufacturing
▪ Appliances manufacturing
▪ Lighting manufacturing

Source: Based on model coefficients in IMPLAN. See Footnote 4.

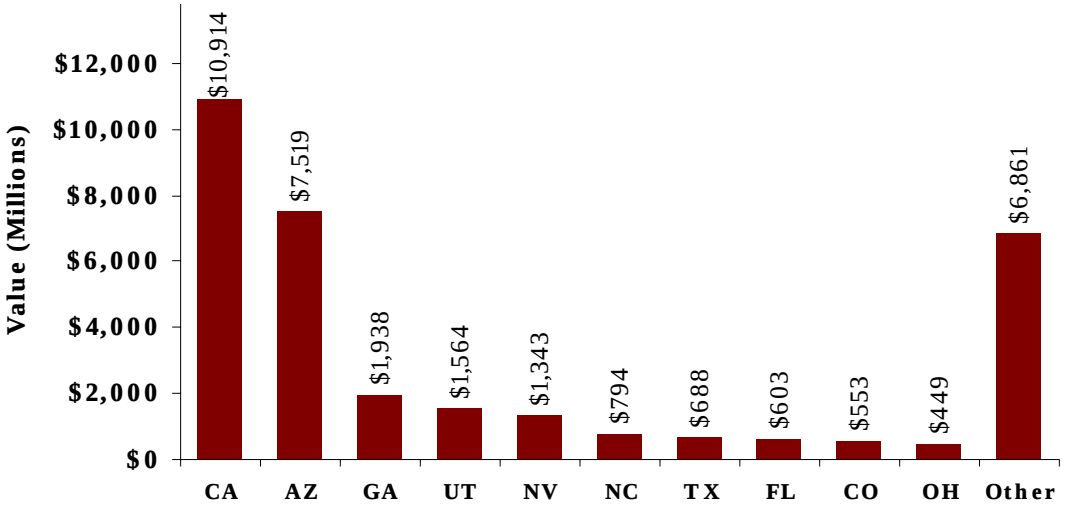
The magnitude of these commodity flows can be measured through a special tabulation of the Commodity Flow Surveys of the Federal Highway Administration and the U.S. Department of Transportation. This is a major data collection effort across regions with the latest flow data being for 2002 and the updated forecasts being for 2006.

To the best of our knowledge, there has been no significant attempt to compile these data except at the overall State level.

Thus, we have tabulated the raw data for Southern Nevada (specifically, the identifiable commodity area of Las Vegas). Based on value of commodity flows received, we present below two sets of information.

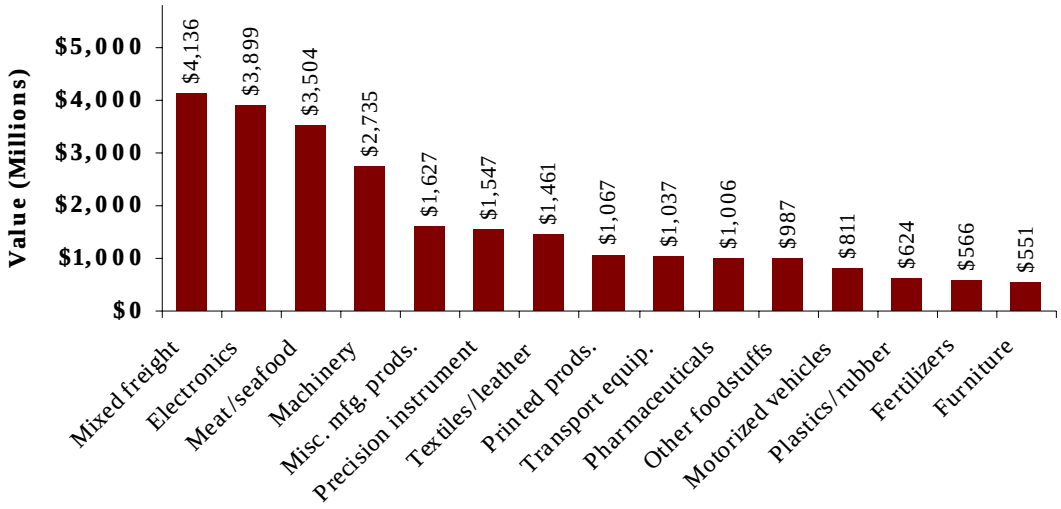
The first set is commodity flow information that presents the major state origin of shipments to Southern Nevada. The second set shows the major types of commodities received (excluding coal for power plant generation and base metals).

Exhibit III-4
Value of Freight Imported into Las Vegas, Nevada, by Origination State: 2006



Source: Tabulations of individual records compiled from U.S. Dept. of Transportation, Federal Highway Administration.

Exhibit III-5
Value of Non-Mineral/Metals Freight Imported into Las Vegas, Nevada, by Category (15 Top Commodities by Value): 2006



Source: Tabulations of individual records compiled from U.S. Dept. of Transportation, Federal Highway Administration.

As shown, California is the major source of Southern Nevada's goods. However, the significant shipments from states to our East raise the issue, at least conceptually, as to the potential for Southern Nevada to combine manufacturing and distribution to Southern California. The transportation network to Las Vegas is both well-defined and understood by multi-state shippers that use rail traffic (Union Pacific) as well as large trucks.

In terms of inflows, by value of commodity, several categories are represented in the targeted business clusters for Southern Nevada. A well-recognized regional development strategy is that of "import-replacement" whereby local manufacturing replaces external shipments. This is particularly relevant for certain categories of goods, such as instruments, medical machinery, and selected industry-oriented electronics (not consumer electronics). If this is indeed a future potential for Southern Nevada, access to the Southern California market over well-established transportation networks already exists.

3. LEASE RATES AND LAND PRICES

"Published" lease rates/square foot (triple-net) on a geographical basis can give conflicting results. This is due to different weighting schemes of combining small spaces (for example, 10,000-square-foot leases) with large distribution centers, differences in availability of large parcels for large distribution development, resulting in expensive "outliers", etc. Frankly, it is possible for some available data to suggest somewhat incongruous relationships.

As discussed in the next section, we were given, on a proprietary basis, access to a set of major "spreadsheet" examples from multi-state shippers, large retailers, and multi-state manufacturers. These conversations and examples reconfirmed our discussions with selected NAIOP members that a general "rule of thumb" is that the cost of land represents approximately 33 percent of warehousing and distribution facility development costs.

Subject to the caveats above, presented below, in the following two tables, are comparative lease rates and land prices for Southern Nevada and other markets.

Exhibit III-6
Warehouse Land Prices
Average ($ PSF)

Region	2000	2001	2002	2003	2004	2005	2006	2007
Bakersfield, CA	na	$1.25	$1.38	$1.90	$2.50	$5.00	$5.02	$5.50
Boise, ID	na	na	na	na	$5.00	$4.00	$3.94	$4.00
Denver, CO	na	$2.75	$3.00	$3.00	$3.25	$3.00	$3.50	$4.00
Fresno, CA	na	$2.25	$2.50	$2.50	$3.00	$4.25	$4.00	$7.00
Las Vegas, NV	**na**	**$9.43**	**$2.88**	**$2.90**	**$7.00**	**$6.66**	**$6.42**	**$9.00**
Los Angeles, CA	na	$5.00	$12.00	$13.00	$13.80	$25.00	$30.00	$30.00
Los Angeles/Inland Empire, CA	na	na	$5.50	$5.80	$5.75	$7.25	$8.15	$7.20
Los Angeles/Orange County, CA	na	na	$14.00	$17.00	$13.63	$23.00	$32.00	$32.00
Phoenix, AZ	na	$2.84	$5.47	$4.50	$1.80	$4.58	$5.68	$15.46
Reno, NV	na	$2.50	$2.20	$2.20	$2.00	$3.75	$3.75	$3.88
San Diego, CA	na	$8.50	$9.00	$5.50	$5.94	$12.90	$16.52	$12.50
United States	$2.68	$4.67	$4.80	$5.95	$6.23	$8.02	$9.47	$9.74

Note: Quoted land prices are for industrial use.
Source: Colliers International U.S. Real Estate Review 2008.

Exhibit III-7
Industrial Market Rents
Average ($PSF NNN)*

Region	2000	2001	2002	2003	2004	2005	2006	2007
Bakersfield, CA	$3.10	$3.20	$3.20	$3.20	$3.20	$3.60	$3.60	$4.00
Boise, ID	$5.00	$4.50	$3.50	$4.40	$4.60	$4.60	$6.03	$6.96
Denver, CO	$4.50	$5.90	$5.65	$5.60	$5.60	$5.55	$4.25	$4.70
Fresno, CA	$3.20	$3.40	$3.20	$3.20	$3.20	$3.20	$3.20	$4.08
Las Vegas, NV	**$3.84**	**$4.08**	**$3.84**	**$4.80**	**$4.92**	**$5.52**	**$5.52**	**$7.18**
Los Angeles, CA	$6.10	$6.60	$7.00	$6.40	$6.50	$6.85	$7.67	$8.04
Los Angeles/Inland Empire, CA	na	na	$4.70	$4.70	$4.70	$5.15	$5.58	$5.84
Los Angeles/Orange County, CA	na	na	$7.00	$7.20	$6.50	$7.20	$8.40	$8.58
Phoenix, AZ	$4.00	$4.80	$5.40	$5.90	$5.80	$6.30	$6.54	$5.98
Reno, NV	na	$3.70	$3.50	$3.50	$3.50	$3.50	$4.08	$4.32
San Diego, CA	$7.80	$7.50	$6.50	$7.60	$8.00	$8.50	$9.00	$8.64
United States	$5.51	$4.88	$4.65	$4.73	$4.73	$4.99	$5.28	$5.62

Rents are 'standardized' to annualized rents across regions.
Industrial triple-net rent includes rent payable to the landlord and does not include additional expenses, such as taxes, insurance, maintenance, janitorial, and utilities. All industrial and high-tech/ R&D rents in this report are quoted on a monthly per square foot basis in U.S. dollars.
Source: Colliers International U.S. Real Estate Review 2008.

We will discuss the implications of relative prices and land availability later in this report. However, the data above suggest the obvious known fact (at least within NAIOP and the commercial development community, in general) that we are a relatively expensive location for warehousing and distribution development.

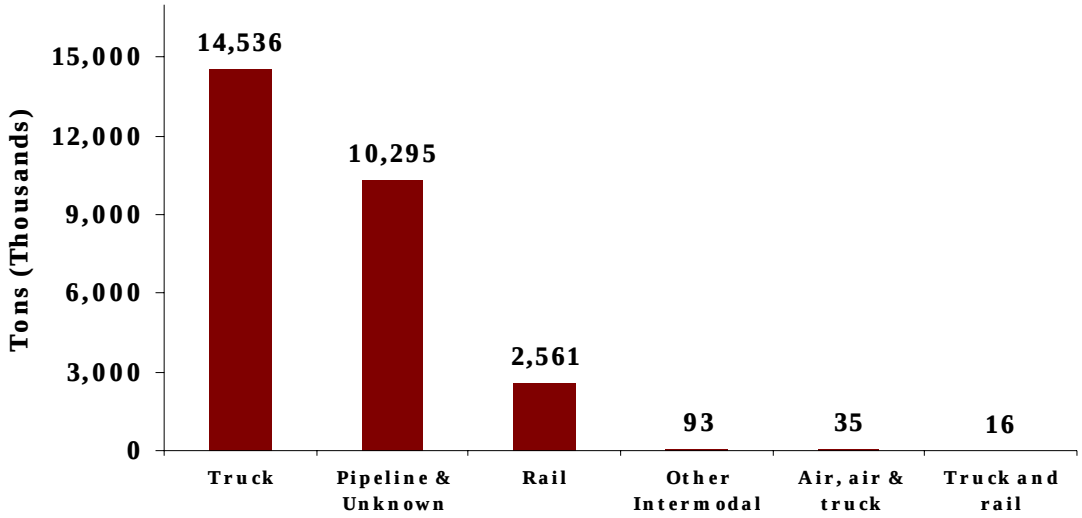
4. SOUTHERN NEVADA GOODS AND FREIGHT MOVEMENT: SALIENT POINTS

There are several facts and issues concerning the current and future movement of goods in Southern Nevada that interact with the future potential for warehouse and distribution development.

Large Truck Movements

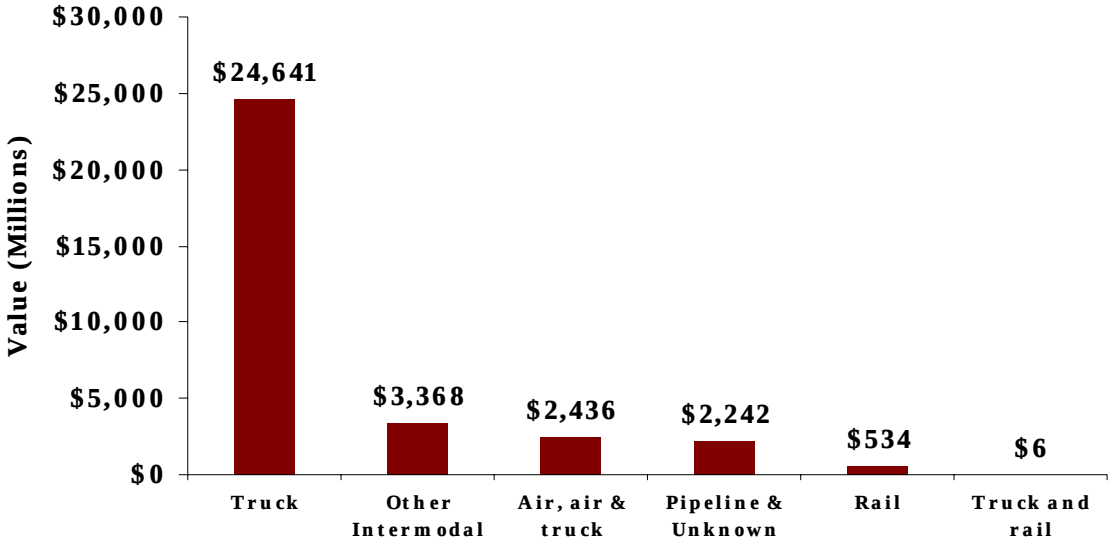
First, most of Southern Nevada's current regional goods movement is associated with large trucks rather than direct rail. Although this may have been suspected, presented below for the first time is data on goods received in Las Vegas, by mode, for both tonnage and value. This information is based on our compilations of the detailed data records from the freight analysis system discussed above.

Exhibit III-8
Tonnage of Freight Imported into Las Vegas, Nevada
by Mode of Transportation: 2006



Source: Tabulations of individual records compiled from U.S. Dept. of Transportation, Federal Highway Administration.

Exhibit III-9
Value of Freight Imported into Las Vegas, Nevada, by Mode of Transportation: 2006



Source: Tabulations of individual records compiled from U.S. Dept. of Transportation, Federal Highway Administration.

The differences in the weight and value of tonnage, by mode, are striking. The role of air freight for high value items, such as seafood and critical hospital pharmaceuticals etc., points out the important distinction in distribution between weight (tonnage) and value.

More importantly, as Southern Nevada grows, it becomes expensive to, for example, ship water (as in soft drinks) or air (as in plastic pipe) into the region compared to manufacturing and distributing products like these locally.

Second, for large truck (long haul) freight movements, the desire to satisfy the current "10-hour" rule for drivers on turnaround distribution (point-to-point and return) assumes manageable traffic congestion times. Unfortunately, as shown below, Las Vegas has three of the top 25 interchange bottlenecks in the nation for large truck long-distance movements, making it impractical under current federal regulations for trucks to the complete this 10-hour "circle" from northern edge of the Las Vegas Valley and beyond, including Apex.

In the long-run, the implications of bottlenecks for development in the Las Vegas Valley towards the "north" relative to the "south" are obvious, because of the 10-hour rule. Simply stated, a truck can not make the round-trip from the Port of Long Beach to the northern edge of the Las Vegas Valley and areas to north within 10 hours, because of these bottlenecks. Accordingly, it becomes impractical to depend on these areas to provide the land (and parcels of the right size) needed to support a viable warehouse distribution facility inventory to serve our local economy.

Obviously, if the federal government increases the 10-hour rule, then these "northern areas" can become viable alternatives. That said, while off-peak scheduling (night) shipments can avoid these congestion issues for a time, as we double in population the congestion issue is very likely to increase in importance, impacting these areas.

Third, that "large-truck within-Southern California freight movements" are generally considered by major interstate freight shippers (direct large truck or intermodal) equivalent in cost to direct shipment from Las Vegas. Specifically, based upon our interviews discussed in the next section of the report, charged freight cost from Las Vegas to the L0s Angeles area (Inland Empire) is the same as within distribution from the Los Angeles area to inner Los Angeles area itself.

Exhibit III-10
Top 25 Highway Interchange Bottlenecks for Trucks
Ranked By Annual Hours of Delay for Large Trucks Making Long Trips

	Interchange Location	Urban Area	Trips Greater Than 500 Miles	
			% of Large Truck Trips	Annual Hours of Delay
1	I-24 @ I-440N Interchange	Chattanooga (TN-GA)	85%	393,100
2	***U.S. 95 @ I-15 Interchange ("Spaghetti Bowl")***	***Las Vegas***	***90%***	***299,800***
3	I-90/94 @ I-290 Interchange ("Circle Interchange")	Chicago-Northwestern IN	53%	286,400
4	I-94 (Dan Ryan Expwy) @ I-90 Skyway Split (Southside)	Chicago-Northwestern IN	53%	281,700
5	I-75 @ I-74 Interchange	Cincinnati (OH-KY)	63%	255,300
6	I-10 @ I-110 Interchange	Baton Rouge	68%	255,100
7	I-80/I-94 split (Southside)	Chicago-Northwestern IN	53%	250,400
8	I-285 @ I-85 Interchange ("Spaghetti Junction")	Atlanta	52%	245,800
9	I-17 (Black Canyon Fwy): I-10 Interchange (the "Stack") to Cactus	Phoenix	48%	240,800
10	Pulaski Rd @ I-55	Chicago-Northwestern IN	53%	240,500
11	I-290 @ I-355	Chicago-Northwestern IN	53%	231,800
12	I-40 @ I-24 Interchange	Nashville	77%	224,500
13	I-285 @ I-75 Interchange	Atlanta	52%	224,400
14	I-35 @ Martin Luther King Jr	Austin	39%	219,600
15	***I-15 between Tropicana and Flamingo***	***Las Vegas***	***90%***	***218,500***
16	I-12 @ Amite River, Baton Rouge	Baton Rouge	68%	215,700
17	I-75 @ U.S. 35 Interchange	Dayton	54%	214,400
18	I-90 @ I-290	Buffalo-Niagara Falls	58%	212,900
19	I-20 @ I-285 Interchange	Atlanta	52%	203,900
20	I-75 @ I-85 Interchange	Atlanta	52%	194,900
21	I-264 @ I-64 Interchange	Louisville (KY-IN)	69%	187,300
22	I-55 (Stevenson Expwy) @ I-294 Interchange	Chicago-Northwestern IN	53%	185,400
23	I-80 @ I-480 Interchange	Omaha (NE-IA)	86%	185,300
24	I-76 @ SR 77 Interchange+J179	Akron	52%	183,000
25	***I-15 @ I-215 Interchange (the "Fishbowl")***	***Las Vegas***	***90%***	***180,300***

Source: U.S. Department of Transportation.

Rail

If Southern Nevada business cluster development is successful, then related manufacturing will utilize more rail services than currently. There are several important points for NAIOP to consider concerning our current (Union Pacific) network and service.

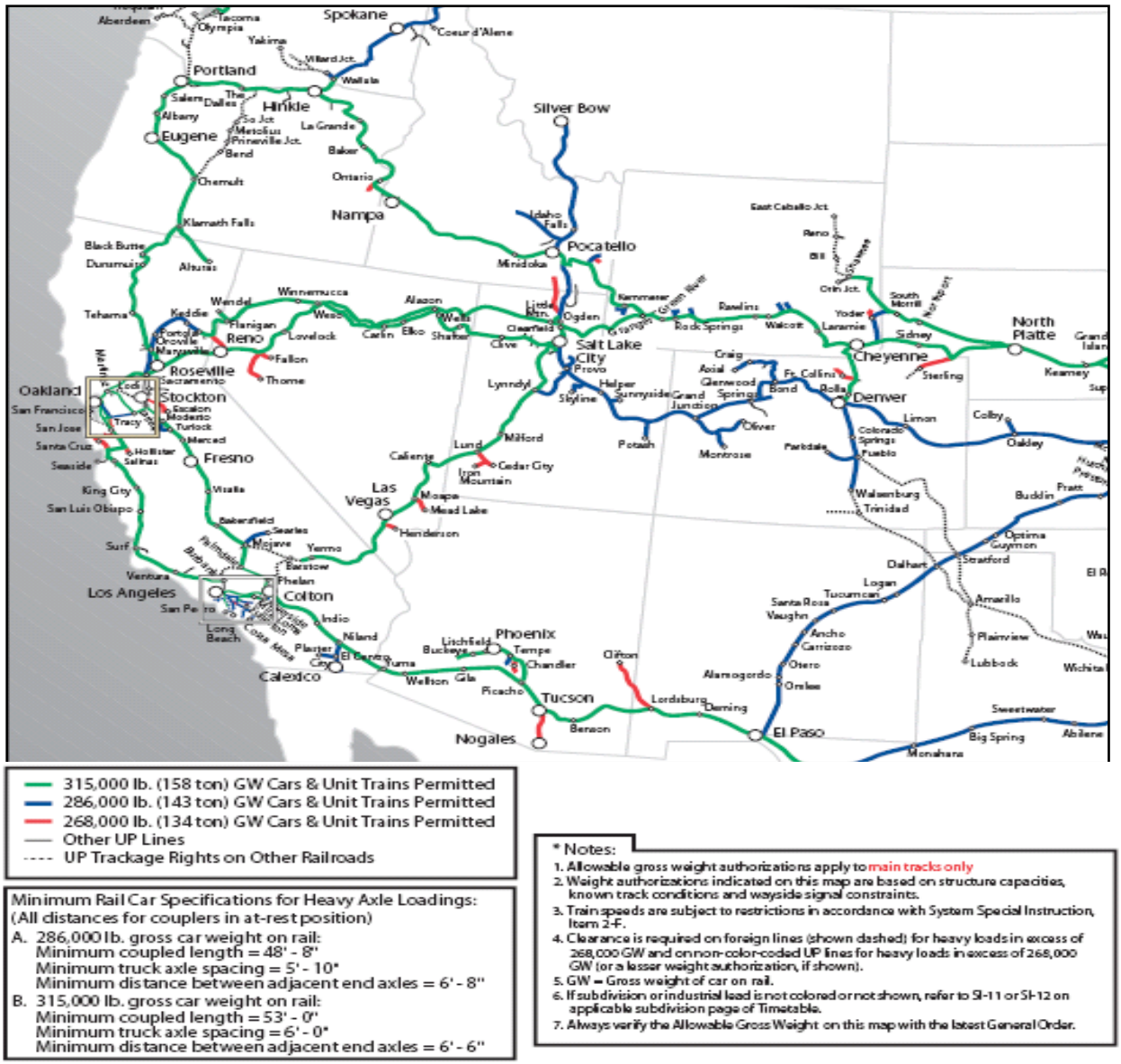
First, on a positive note for Southern Nevada's competitive distribution position relative to Phoenix, it is important to remember that our rail service to Southern California is twice as fast as from Phoenix to Southern California (two days versus four days due to "dead time" out of Arizona). As seen on the following map, the system "turn" at Picachio junction to Phoenix intersects the main line to Tucson and El Paso. This junction is a significant bottleneck and there are, to the best of our knowledge, no current plans to invest in capital improvements.

Second, the Union Pacific does appear to have made a near-future decision to close *both* the Arden yard and Valley yard in Southern Nevada and to consolidate operations in a location "potentially" near APEX. However, intermodal drop-off service to the current Pan Western Corporation facility will be maintained.

Third, in terms of local service regarding existing rail spurs, Union Pacific appears to be immediately planning to reduce (remove) small local spurs by approximately 10%, annually. If this happens, in our opinion, it reflects the economics of serving large interstate customers compared to small service requests.

It is also important to recognize that current plans for rail investment in infrastructure do not alter the conclusions above.[5]

Exhibit III-11
Western Region Allowable Freight Gross Weight Map

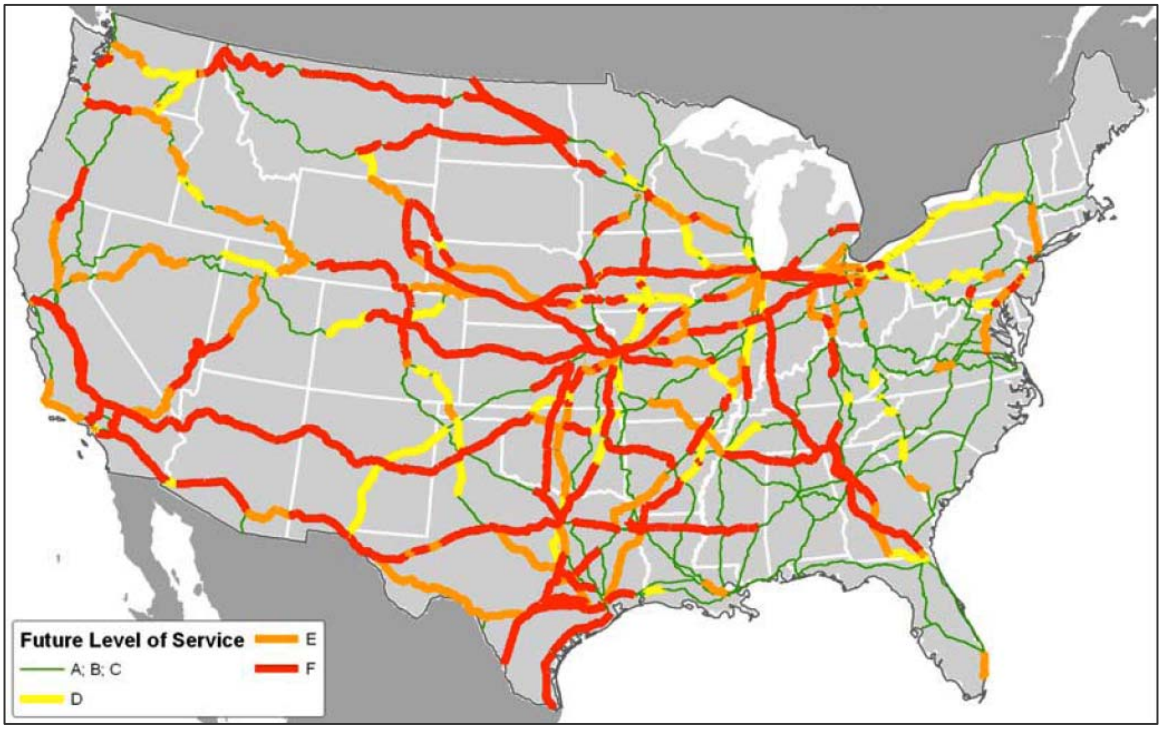


Source: Union Pacific.

[5] *Based upon the recently completed "National Rail Freight Infrastructure Capacity and Investment Study", Association of American Railroads, available at the AAR website as of 2008.*

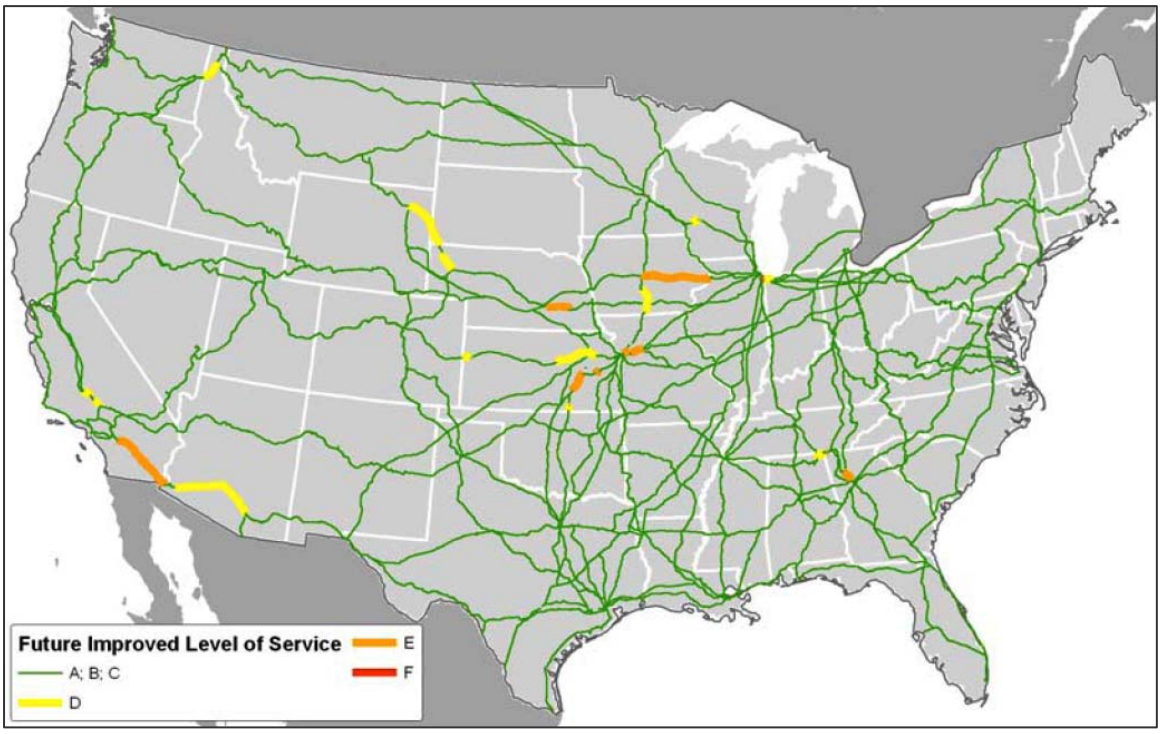
Shown below in Exhibit III-12 compares future rail volumes to future corridor capacity t0 2035 without system improvements. The alphabetical levels "A-F" represent industry-accepted service levels. To summarize, "A, B, C" are below capacity, "D" is near capacity, and "E and F" are problematic. As shown, the major routes would be at dangerous service levels.

Exhibit III-12
Future Corridor Volumes Compared to Current Corridor Capacity
(t0 2035 without Improvements)



However, even if one assumes that every dollar of proposed investment takes place, it is still true that only routes through Las Vegas into Southern California achieve a level of "A, B, C". This is not true for the Southern routes through Southern Arizona. This is shown in Exhibit III-13.

Exhibit III-13
Future Train Volumes Compared to Future Train Capacity
(to 2035 with Improvements)



Inland Port

The growth of shipments through the Port of Long Beach is anticipated to exceed 100% over the next decade. This is largely due to the growth in imports from Asia, primarily China. Long Beach is expected to handle nearly 80% of all of the imports from China over the next 40 years. This will result in additional pressure on the "Alameda Corridor" in Southern California and increased truck and rail traffic from Southern California to and through the Las Vegas Valley along I-15.[6]

The most likely relief scenario for the bottlenecks created at Long Beach will be a potential new port in Baja Mexico. It is expected to come online within 10 years.

[6] *For a discussion of future regional goods movement with in Southern California, see Southern California "Regional Strategy for Goods Movement: A Plan for Action", Position Paper, Southern California Association of Governments, 2005.*

As noted above, the role of air freight for high value items (as contrasted to tonnage) is also important. The role of international air freight should increase as international trade expands and congestion costs from Southern California increase. Based on our research, for an inland port to be located in Southern Nevada within the next 20 years will require it to be associated with a new airport.[7]

[7] *To summarize this position, there is a basic problem facing a "traditional" inland port based upon only rail intermodal (Las Vegas substituting for Long Beach). This relates to the fixed costs of container handling. Currently, these costs are approximately $300 per container ($150 each on-off). Las Vegas is "too close" to Long Beach to absorb these costs compared to Long Beach, for example, shipping the container to Chicago.*

SECTION IV

SOUTHERN NEVADA'S STRATEGIC POSITION

IV. SOUTHERN NEVADA'S STRATEGIC POSITION

The previous section serves as important background for a major area of interest for NAIOP and public policy makers, namely: What is the competitive position of Southern Nevada for regional distributional and warehousing and for satisfying the region's own needs?

There are three basic types of distribution facilities relevant to future economic growth and development in Southern Nevada:

- Manufacture and distribution for regional export (Southern Nevada or the Southwest)
- Import (from International Port) and distribute regionally
- Distribute primarily to Southern Nevada

The analysis below uses a methodology, based on TRI's actual experience in proprietary route modeling for supermarket distribution (in Southern California); and a series of interviews with logistics managers handling both retail and manufacturing operations in Southern Nevada and the Southwest.

TRI was allowed access to a set of proprietary distribution applications that form the basis of our discussion below. However, our analysis does not represent or is not intended to represent any specific retailer, motor carrier, or manufacturer in Southern Nevada, the Midwest, or Southwest. Our interviews and examples are based on carriers with ties to the ports of Long Beach and Los Angeles, and, in addition, contracts with major national distribution chains that include well-known retailers.

Also, we discuss herein intermodal rail movements with the Union Pacific which is, of course, the rail service provider to Southern Nevada.

Organizations and their individual members represented above include the:

- Transload Distribution Association,
- National Motor Freight Association, and
- Union Pacific Distribution Services.

A Preview and Summary of Results

Before presenting several examples to illustrate our analysis, it is useful to present a brief summary.

The fundamental reason why NAIOP concerns are important to the general Southern Nevada economy and community is that the region can be a viable distribution hub if it has access to large customer-bases (e.g., Southern California's 19 million people) under the assumption of "reasonable" distribution costs, which also will facilitate economic diversification.

If being such a hub is not part of Southern Nevada's future, then there is the potential unforeseen consequence of our community becoming, in terms of logistic costs, an "island" with relatively higher production costs. The implications of this possibility on regional economic growth and development will be explored in Section VI of this report.

To summarize:

- A simple calculation process between Southern Nevada and elsewhere would be as follows:

  Take the monthly differential in lease costs between an alternative location to service the Las Vegas area (such as Phoenix or Riverside), and compare this total to the monthly differential of freight transport costs (costs per mile times distance times assumed hauls).

This approach leads to a correspondingly simple result:

Warehousing and distribution activity that has to be in the Las Vegas area as a sole distribution market will be here even at relatively high lease rates, but very little other activity will be.

Freight costs at older contract lows of $1.25 per mile, or higher, to current prices per mile in the range of $1.60-$1.80 (current fuel price trends are negative) appear to allow a range of lease cost differentials, such as $.10-$.12 per-square-foot (for example, $.46 per-square-foot versus $.34 per-square-foot). Adding in Summer (July) 2008 fuel surcharges to base-rates at a factor of 1.37 only reinforces these conclusions.

- The ability to locally manufacture/assemble products for both local consumption and export to either Southern California, Phoenix, or both dramatically and positively changes the calculus for distribution in Southern Nevada.

  This is due to the pronounced inequality in freight distribution charges to and from Las Vegas compared to other markets. In simple terms, Southern Nevada provides a large customer market, but does not have much to send back or "export" to other regions.

  With intermodal and unit (stack) trains service to Las Vegas, the development of industry clusters allows potential for significant distribution to Southern California.

- Conceptually and positively, Southern Nevada does have the potential ability to act as a regional distribution center to all or a portion of the Southwest, assuming appropriate sites are available that do not have bottlenecks relative to interstate access.

> The fundamental problem is that Southern Nevada does not have access to appropriate sites for large-scale distribution or manufacturing operations at a reasonable cost.

Currently, land is limited south of the U.S. 95/I-215; APEX does not have access via what once was proposed as the "I-15 Northeast Corridor"; and other options within Nevada (such as land along U.S. 40), which provide access to the substantial Arizona and Southern California markets, are limited.

Regarding the I-15 Northeast Corridor, in 2002, the Nevada Department of Transportation ("NDOT") completed a study that recommended a new freeway to help reduce traffic congestion in the eastern portion of the Valley. The "Interstate 15 Northeast Corridor Study" found that roadways in the area were limited in number, congested and not wide enough to accommodate future traffic demands. One of two proposals was recommended for further study and included an "eastern beltway" from Henderson to North Las Vegas.

At the time, the study recommendations generated significant political and public attention, because the project would have transected heavily populated neighborhoods. NDOT determined that that the impacts would be relatively large. The agency estimated that any action, including widening existing arterials, would impact residents in the east side of the Valley. In 2002, there was a general consensus that planned and proposed development in North Las Vegas and Henderson would make traffic congestion worse. Additionally, the thought was that expansion of U.S. 95/93 and I-15 were also going to be extremely important and required, but would not likely be enough to handle the increased amount of traffic.

In April of 2002, the Clark County Commission decided it would not approve any of the eastern beltway routes that NDOT had been studying since September 2000. Lack of support for an eastern leg meant that the County's 215 beltway would only circle about 75% of the Valley from for the foreseeable future. The Commission's also directed the Clark County Department of Public Works to analyze building "super arterials", like Desert Inn, along either Lamb or Nellis Boulevards. The roads would connect either I-15 or Las Vegas Boulevard on the north with U.S. 95. near Sahara Avenue.

Illustrative Examples

Provided below are three examples that illustrate the tradeoffs involved in competitive distribution for Southern Nevada. All of these are conceptually, based on "real-world" situations as discussed above.[1] Figures utilized for mileage, etc. are approximations for illustration.

The first example below is an admittedly straightforward exercise to illustrate the current role of asymmetric freight movement costs.

The remaining two examples are more realistic and suggest more complex issues and more interesting tradeoffs.

Example 1: A Simple Unequal Freight Cost Example

Given the demographic realities of market size related to population sizes in the Southwest, the major issue for Southern Nevada is its ability (or lack thereof) to service Southern California and to serve as a "route junction" within the Southwest.

However, in order to define a basic issue related to actual freight charges, as contrasted to mileage calculations, the following considers a decision to locate in Phoenix and to ship back to Las Vegas. The monthly lease rate in Las Vegas for the 500,000-square-foot facility is assumed to be $0.46 per square foot, with a corresponding cost of $0.34 in Phoenix, that is, a differential of $0.12 or 35%.

Although higher lease rates in Las Vegas imply negative impacts on the prices of delivered goods and, as discussed above, economic cluster development, the absolute level of prices are not of concern in this analysis. Possible high absolute levels of prices in Southern Nevada are a concern for economic development and represent a meeting point with issues raised by NAIOP.

[1] *One real-world variable that impacts all calculations in this section is uncertainties related to future fuel surcharges. The current whip-saw of crude oil prices suggests the magnitude of future uncertainties. All calculations here are based on commonly utilized base-rate charges independent of fuel surcharges. To put this in a cost context, a "rule of thumb" is that for every $.05 change in the price of diesel fuel, it will result in a 1% additional fuel charge.*

In this example, the product is assumed to initially reach both cities at the same cost, the relevant market is Las Vegas, and, if it comes from service by either unit train or by motor freight from the Port of Long Beach, the arrival in either city is on the same schedule and at the same transportation charges. All other costs, such as taxes, etc., are the same. These are, of course, hypothetical assumptions but they allow us to initially focus on the topic of interest.

As shown in the following table, two cases are presented. Each will be discussed in turn. For simplicity, the calculations below initially use a one-way base-rate to which applicable contract fuel surcharges are not applied.

Exhibit IV-1
2007 Las Vegas versus Phoenix:
Simple Warehouse Rent and Freight Cost Comparison

	Las Vegas	Phoenix
Rent		
Square feet needed	500,000	500,000
Rent/square-foot/month	$0.46	$0.34
Rent Cost Per Month	**$230,000**	**$170,000**
	-	-
Freight Cost [Case 1]		
Loads outbound		100
Net cost per load		$600
Total Freight Cost/Month		**$60,000**
Total Cost of Business	**$230,000**	**$230,000**
Freight Cost [Case 2]		
Loads outbound	300	300
Net cost per load	$400	$600
Total Freight Cost/Month	$120,000	$180,000
Total Cost of Business	**$350,000**	**$350,000**

Source: Member data, Intermodal Distribution Association.

Even with a 35% higher lease rate, as shown in Case 1, any distributor of more than 100 loads per month to Las Vegas will endure the higher lease rate. Currently, the load charge from

Phoenix is approximately $600.[2] With 100 loads being a modest level, if a company needs to be in Las Vegas under our set of assumptions, distribution will indeed be in Las Vegas. Any differential in lease rate per-square-foot that is less than $.12 would require, of course, correspondingly even fewer loads.

However, the cost above of $600 per load may appear to be a bit unusual. After all, standard highway mileage between Las Vegas and Phoenix suggests numbers in the range of 268-288 miles. The $600 figure certainly seems higher than any multiplication of mileage times published per mile rates.[3] The reason: The higher figure is due to the fact that motor freight generally does not return to Phoenix with freight originating in Las Vegas. That is, the $600 figure assumes "deadhead" miles back to Phoenix.

In Case 2, note that the "same" trip from Las Vegas is estimated to be $400, since the carrier will return to Las Vegas with a full load. In this case, assume that all of our assumptions hold except that we are potentially distributing between both cities. In this case, the crucial factor is the cross-differential of $200 per load, which implies a breakeven load-point of 300 loads to offset the monthly lease differential of $60,000. Charges for the trips above are now being negotiated at base-rates of $450 and $650, respectively, but the differential is still maintained at the $200 level.

To place this calculation in perspective, a modern warehouse operation turning 40 loads per day on a 7-day per week schedule would make up the difference of $60,000 in about a week. Any more shipments than this and a distributor will choose Las Vegas.

If a fuel surcharge cost factor of 1.37 is applied to the mileage costs in the table above, the same conclusions apply. That is, modern warehouse operation would make up the difference in about 1.5 weeks.

[2] This "rule of thumb" rate is used internally by one large distributor of food products and, in addition, one large manufacturer of consumer paper products. It is also used by a major motor freight carrier.
[3] Mileage publications for interstate motor freight include "Per Mile Costs of Operating Cars and Trucks 2003-2019", Minnesota Department of Transportation, and the "OOIDA Cost Per Mile Worksheet", Owner-Operators Independent Drivers Association.

Example 2: Distribution to the "North-Northeast" from Inland Empire area or Southern Nevada*

Based on a blending of two real-world proprietary cases, the example below considers the question of goods movement to a separate distribution center from Las Vegas versus distribution to the same distribution center from the Inland Empire.

This example is of interest, because it assumes direct freight transfer to Las Vegas from Long Beach for further distribution elsewhere in the region.

The monthly lease rate in Las Vegas for the 400,000-square-foot facility is assumed to be $.46 per-square-foot, with a corresponding cost of $0.34 in California, a differential of $0.10. Again, absolute prices matter in setting price levels and basic feasibility, but in the comparative case below it is the differential that matters.

The example below adds, for illustrative purposes, an average utility cost and a workman's compensation rate, both of which favor Nevada.[4] The comp rate used for California is a high figure, assuming a company with recent injuries, etc. In addition, the total miles to the distribution center are higher from California than from Las Vegas with (due to topography) a higher per mile cost. It should also be noted that the cost of container movement (dray) to the "local" distribution center in Southern California is fairly steep compared to actual mileage (the figure of $250).

[4] *No corporate income tax on assumed profit is included (but is so included in the next example).*

Exhibit IV-2
2007-2008 Shipment to Regional Distribution Center via Staging from Inland Empire Area or from Las Vegas after Initial Distribution

	Las Vegas	Inland Empire	Difference: LV-IE
Transportation			
# of containers	3,500	3,500	
Cost of dray	$850.00	$250.00	
Transportation costs per year	**$2,975,000**	**$875,000**	**$2,100,000**
Storage			
Warehouse square footage	400,000	400,000	
Cost per foot for warehouse	$0.46	$0.34	
Storage costs per year	**$2,208,000**	**$1,632,000**	**$576,000**
Labor			
# of labor needed for warehouse	45	45	
Wage per hour	$12.00	$12.00	
Workmen comp %	8%	22%	
Yearly labor total	**$1,166,400**	**$1,317,600**	**-$151,200**
Utilities			
Utilities KW per year	857,000	857,000	
Cost per KW hour	$0.075	$0.10	
Yearly utilities costs	**$64,275**	**$85,700**	**-$21,425**
Hauling			
Average length of haul to DC	1,100	1,400	
Hauls per year	2,625	2,625	
Cost per mile	$1.25	$1.50	
Yearly hauling costs to Regional DC	**$3,609,375**	**$5,512,500**	**-$1,903,125**
Yearly operating costs	**$10,023,050**	**$9,422,800**	**$600,250**

Source: Confidential data from major interstate and intermodal firms with significant operations in California and Nevada.

With the advantages listed above, a reasonable hypothesis would be that a Southern Nevada location would be optimal relative to the Inland Empire distribution area. However, as shown, given the specific assumptions, Southern Nevada loses by approximately $500,000 per year. Why is this?

Fundamentally, there are two reasons for the disadvantage to Southern Nevada. These two reasons are:

- On an annual basis, the $0.10 differential in the per-square-foot lease rate per month is almost equivalent to the final negative differential. Each additional penny adds $4,000 in costs per month for the assumed facility, or $480,000 per year.

  Even a reduction in this differential by $0.05, combined with incremental improvements noted below, would tip the advantage to Nevada.

  The above statement is particularly true if we recognize the corporate income tax in California of 10%. For illustrative purposes, only, suppose that a reasonable annual profit for the facility is in the range of $2.0-$2.5 million. This additional factor is significant.

- The initial relative cost of container movement to Las Vegas ($850 per container to Las Vegas for 3,500 containers implies a differential with the Inland Empire area of $600 per container to overcome) is fairly high.

  If this can be reduced through economic diversification (on average) by even a moderate amount (say $125), then the competitive position of Southern Nevada is dramatically enhanced.

More importantly, the example here illustrates the fundamental problem that Southern Nevada does not have access to appropriate sites for large scale distribution or manufacturing operations at a reasonable cost with rail access. If business development, based on Midwest sourcing, is of a sufficient scale to allow regularly scheduled TEU service from the Midwest,

then, of course, backhaul from Inland Empire is eliminated and the choice of Southern Nevada is assured.[5] It must be assumed, of course, that any volumes to Las Vegas are consistent with current unit train sizes of a 75-car unit, each car of which can handle four TEU (for a total of 300 TEU per train).

- An example of a local distribution facility in this general mode is Fellowes, Inc. In terms of local manufacturing, the tissue converting facility and tissue mill of Potlatch Corporation can be cited based on materials from Idaho.

Two remaining observations ("sensitivity analysis") concerning the numerical calculations above are appropriate to note.

- Using a higher average per mile rate of $1.71 (as a blend of Summer 2008 rates of $1.60-$1.80 per mile) and a fuel surcharge factor of 1.37 per mile do slightly reduce the LV-IE differential for "yearly hauling costs" to approximately $1,845,000.

- Higher total costs of delivered goods would, of course, be expected to reduce total demand for shipped goods, but the relative position of Southern Nevada and the conclusions of the example remain valid.

Example 3: Riverside versus Southern Nevada

The following example is also based on a real-world proprietary case and directly addresses the issue of distribution into the Los Angeles area from Southern Nevada versus distribution from Riverside. Goods are assumed to originate from the Port of Long Beach.

The basic calculations to be discussed below favor a Riverside location under the current circumstances. However, the implications of the same calculations are quite positive for Southern Nevada if certain changes were to occur.

[5] *TEU refers to "twenty foot equivalent units" which make up the configuration of the standard container train load.*

The basic decision centers on distribution from a large 750,000-square-foot facility. The monthly lease rate in Las Vegas for the facility is assumed to be $.46 per square foot, with a corresponding cost of $0.33 in Riverside, a differential of $0.07.

The example uses a range of utilities and their costs, as well as "normal" workman's compensation rates. In addition, the California corporate tax rate of 10% is applied to the Riverside location.

Loads inbound to Las Vegas are assumed to face unequal freight rates from Long Beach ($650) due to deadhead miles. As suggested separately in our interviews, a common $400 charge per load outbound from Las Vegas to Los Angeles is used. Due to severe congestion within the Los Angeles basin, it is interesting to note that this figure is equivalent to the $400 freight charge assumed for a "Riverside to Los Angeles" movement.[6] In the example below, no fuel surcharge rates are applied to the base per mile haulage rates.

[6] *This point and load charge was verified by multiple interview sources.*

Exhibit IV-3
2007-2008 Distribution to Los Angeles from Riverside versus Distribution from Las Vegas

	Las Vegas	LV Total	Riverside	River. Total	Difference: LV - River
Labor					
People employed	225		225		
Rate per hour	$15.00		$15.00		
Workman's comp rate per 100	$5.00		$10.00		
Labor costs per year		**$7,087,500**		**$7,425,000**	**-$337,500**
(2,000 hours per person)					
Utilities					
Water usage per year	400,000,000		400,000,000		
Rate per thousand	$1.75	$700,000	$2.50	$1,000,000	
Gas usage per year in therms	125,000		125,000		
Rate per therm	$2.50	$312,500	$3.00	$375,000	
KW hours used per year	1,250,000		1,250,000		
Rate per KW	$0.08	$93,750	$0.12	$150,000	
Utilities cost per year		**$1,106,250**		**$1,525,000**	**-$418,750**
Rent					
Square feet needed	750,000		750,000		
Cost per square feet per month	$.46		$0.33		
Rent cost per year		**$4,140,000**		**$2,970,000**	**$1,170,000**
Freight Cost					
Loads inbound	2,500		2,500		
Cost per load	$650		$250		
Loads out bound	2,500		2,500		
Cost per load	$400		$400		
Total freight cost		**$2,625,000**		**$1,625,000**	**$1,000,000**
State Corporate Taxes					
Assumed Total Annual Profit	$5,000,000		$5,000,000		
Tax rate	0%		10%		
Total corporate taxes		**$0**		**$500,000**	**-$500,000**
Total Cost of Business		**$14,958,250**		**$14,045,000**	**$913,250**

Source: Confidential data from major interstate and intermodal firms with significant operations in California and Nevada.

As shown, there is an overall cost advantage to Riverside of approximately $374,000. However, it should also be noted that:

- A reduction of $0.03 per-square-foot in the Las Vegas estimate of costs per-square-foot per month eliminates 72% of the difference.

- Even modest manufacturing or assembly activity in Las Vegas that would reduce the unequal freight charge by $100 (for the assumed 2,500 loads) lessens the overall cost advantage by 67%.

- In a best-case where deadhead loads were totally eliminated resulting in the per load freight charge of $400, Southern Nevada would unambiguously be an optimal location.

- Even if unequal freight charges remain totally, if public policy in Southern Nevada were to set aside land for regional distribution centers that resulted in similar prices to alternative areas, the region would unambiguously be an optimal location.

  As previously noted the fundamental problem is that Southern Nevada does not have access to sufficient appropriately sized sites to accommodate large scale distribution or manufacturing operations at a reasonable cost.

  As noted, land is currently limited south of the U.S. 95/I-215, APEX does not have access to the long-proposed Eastern Corridor, and other options within Nevada (such as land along U.S. 40), which provide access to the substantial Arizona and Southern California markets, are limited.

- In this instance, if none of the above positive changes were to occur, then the recent dramatic increases in fuel surcharges *do* negatively impact the competitive position of Southern Nevada. Using the current factor of 1.37, the negative differential in freight cost for Southern Nevada increases by $370,000 (to a total differential of $1,370,000).

- Even using the high fuel surcharges, the combination discussed above of moderate reductions in lease costs per square foot and asymmetric freight charges would still result in a highly competitive position for Southern Nevada.

The three examples above illustrate the strong linkage between long-term economic development and diversification and opportunities for warehousing and distribution in Southern Nevada. Lower land prices (which represent approximately 33% of the costs of warehouse construction) certainly lower lease rates per-square-foot, but it is the concurrent joint stimulation of the manufacturing sector or value-added products that also lower the effective inbound freight charges.

SECTION V

LAND AVAILABILITY IN SOUTHERN NEVADA

V. LAND AVAILABILITY IN SOUTHERN NEVADA

As presented in the previous section of this report, cost data suggest the obvious known fact (at least within NAIOP) that we are a relatively expensive location for warehousing and distribution development.

However, what is often not appreciated is the basic lack of land for development of larger warehousing and distribution centers. This concept is, of course, nothing new to NAIOP and its developer members, especially. For example, NAIOP has expressed concern over the general lack of availability of industrial land in its newsletters, monthly meetings, and discussions with public officials.

To provide a perspective on land availability, presented below are a series of exhibits illustrating available land uses. by type, in Southern Nevada.[1] These represent zoning categories for a broader definition than warehousing and distribution only, but they illustrate the scarcity issue relative to larger parcel sizes for industrial uses. Simple average size calculations (acres divided by number of parcels) suggest the fundamental problem. For the City of Henderson, it should be noted that one specific large site is near the Executive Airport and is being considered for transfer to the City through the proposed Southern Nevada Limited Transition Area Act. Since this site is 500 acres, removing it from the list of available land makes average size of remaining parcels fairly small.

Given TRI's work with the SNRPC, the estimates of industrial land availability herein are shown by jurisdiction and parcel size. It is important to note that these figures represent the new official estimates that will be used for planning purposes by the Cities and the County.

The estimates are based on parcels in each jurisdiction developed from aerial mapping completed at the end of 2007, and only recently geo-coded with the future planning databases on a Valley-wide basis.

[1] Data is from agencies of City of Las Vegas, City of North Las Vegas, City of Henderson, and Clark County through coordination of SNRPC Land Use Working Group (2008).

The information below is presented in a series of six tables and four accompanying maps for the BLM Disposal Boundary, the County, and three municipalities.[2]

Several points to note are:

- The new total figure of available acreage of approximately 6,600 acres is 12% lower than previous figures often quoted in the range of 7,500 acres.

- The total acreage includes sites that, due to location, etc., are not necessarily economically viable.

- Restricting the acreage to parcels of a size greater than 10 acres reduces total overall acreage estimates by about 26%. Larger parcels (10 acres or more) decrease the total by approximately 1,700 acres. Again, these are not necessarily economically viable. As noted in prior correspondence, even with the current economic slowdown, Southern Nevada is forecasted to be one of the fastest growing areas in the United States through 2035.

The new data tend to reinforce the concerns of NAIOP on the issue of land availability, especially of industrial land. This is particularly true given the spatial pattern of the available land in the Valley. SNRPC plans call for balanced growth throughout the community, rather than sub-area concentration.

It is important to note that the role of industrial development, particularly large-scale warehousing and regional distributing, would provide opportunity for successful economic diversification and development in Southern Nevada. Nevada's doubling of population will result in the "law of large numbers" where a local location would be more desirable compared to shipping to Nevada from elsewhere. Additionally, Southern Nevada does have the potential ability to act as a regional distribution center to all or a portion of the Southwest U.S., given the availability of appropriate sites that are viable from size and price standpoints.

[2] *The larger parcels on the maps (shown in red) tend to overlap and do not necessarily present either contiguous land under single ownership. In addition, not all of the smallest parcels could be shown visually.*

1. EXHIBITS

The tables and corresponding charts below present summarized acreage estimates for the vacant industrial land in the Valley within the BLM Disposal Boundary, and comparable figures for the Valley's four jurisdictions.

Exhibit V- 1: Vacant Industrial Land, by Jurisdiction, within the BLM Disposal Boundary - 2008

Jurisdiction	Number of Vacant Industrial Parcels	% of Total	Acreage	% of Total
Unincorporated Clark County	229	24.6%	3,477	52.5%
City of Las Vegas	58	6.2%	162	2.5%
City of North Las Vegas	438	47.0%	1,905	28.8%
City of Henderson	207	22.2%	1,075	16.2%
Total	**932**	**100%**	**6,619**	**100%**

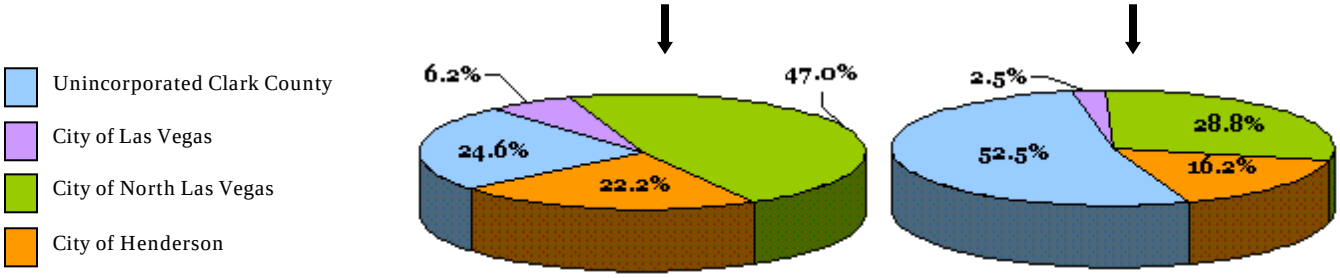


Exhibit V-2: Vacant Industrial Land, by Parcel Size, within the BLM Disposal Boundary - 2008

Size of Parcels	Number of Parcels	% of Total	Acreage	% of Total
Less than 5 Acres	667	71.6%	911	13.8%
5 -10 Acres	116	12.4%	816	12.3%
10 - 25 Acres	78	8.4%	1189	18.0%
25 Acres or Larger	71	7.6%	3703	55.9%
Total	**932**	**100%**	**6,619**	**100%**

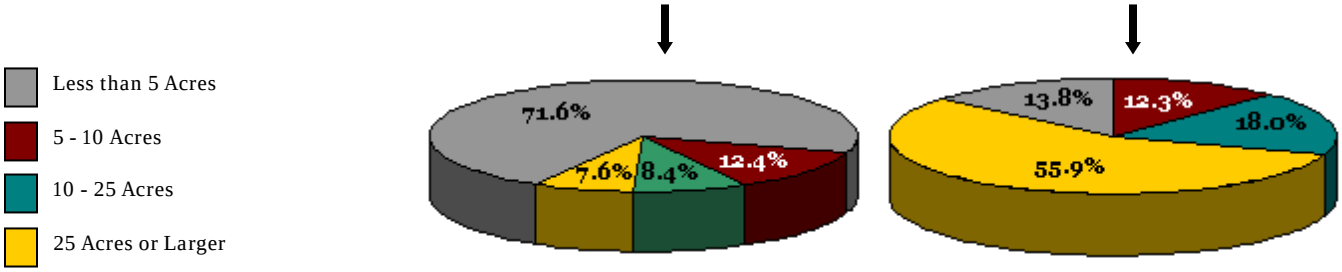


Exhibit V-3: Unincorporated Clark County Vacant Industrial Land, by Parcel Size, within the BLM Disposal Boundary - 2008

Size of Parcels	Number of Parcels	% of Total	Acreage	% of Total
Less than 5 Acres	112	48.9%	209	6.0%
5 -10 Acres	39	17.0%	284	8.2%
10 - 25 Acres	36	15.7%	548	15.8%
25 Acres or Larger	42	18.3%	2,436	70.0%
Total	**229**	**100%**	**3,477**	**100%**

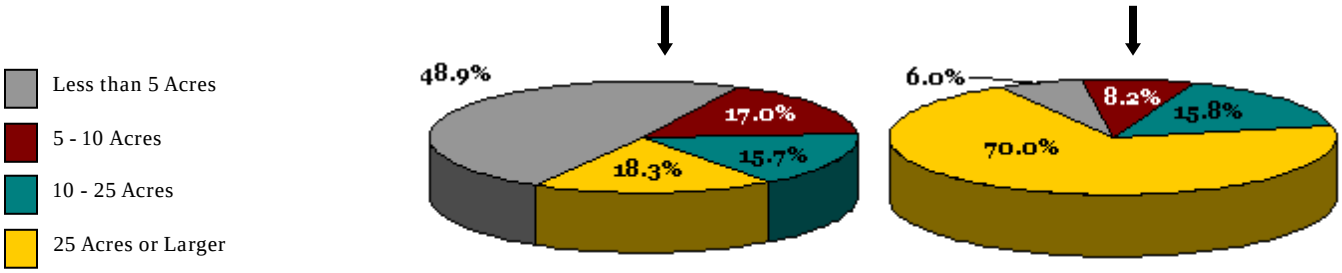


Exhibit V-4: City of Las Vegas Vacant Industrial Land, by Parcel Size, within the BLM Disposal Boundary - 2008

Size of Parcels	Number of Parcels	% of Total	Acreage	% of Total
Less than 5 Acres	53	91.4%	46	28.1%
5 -10 Acres	3	5.2%	17	10.3%
10 - 25 Acres	0	0.0%	0	0.0%
25 Acres or Larger	2	3.4%	100	61.6%
Total	**58**	**100%**	**162**	**100%**

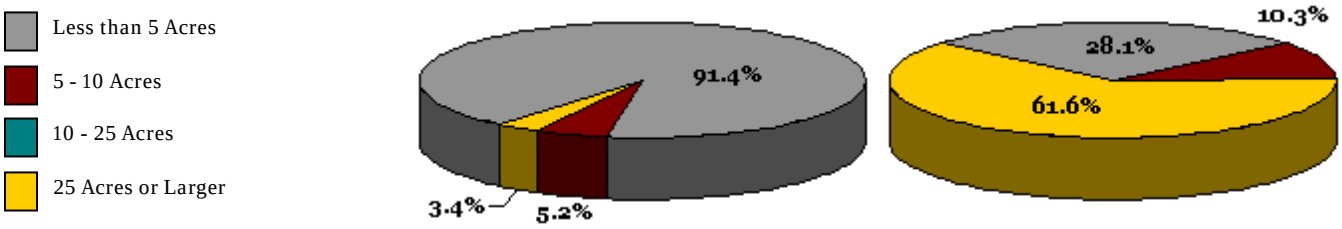


Exhibit V-5: City of North Las Vegas Vacant Industrial Land, by Parcel Size, within the BLM Disposal Boundary - 2008

Size of Parcels	Number of Parcels	% of Total	Acreage	% of Total
Less than 5 Acres	349	79.7%	446	23.4%
5 -10 Acres	44	10.0%	321	16.9%
10 - 25 Acres	27	6.2%	413	21.7%
25 Acres or Larger	18	4.1%	725	38.0%
Total	**438**	**100%**	**1,905**	**100%**

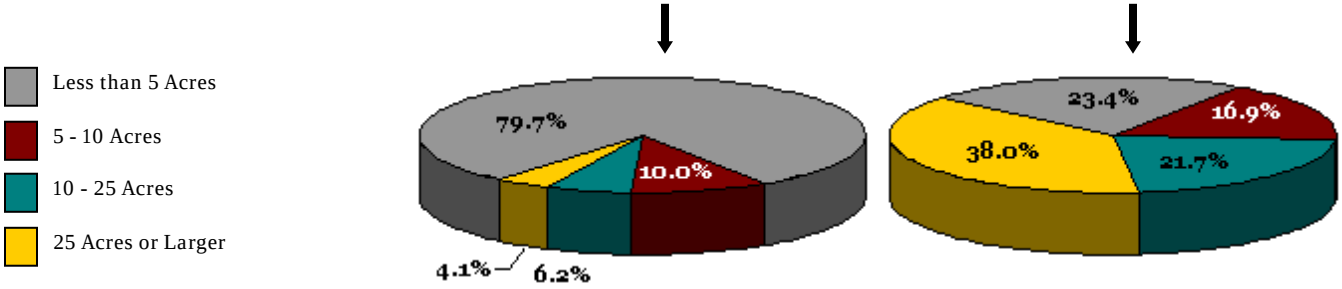
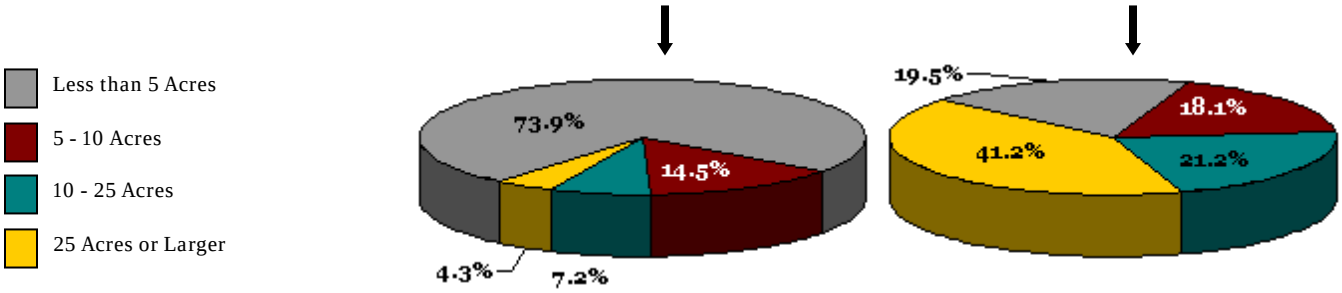


Exhibit V-6: City of Henderson Vacant Industrial Land, by Parcel Size, within the BLM Disposal Boundary - 2008

Size of Parcels	Number of Parcels	% of Total	Acreage	% of Total
Less than 5 Acres	153	73.9%	210	19.5%
5 -10 Acres	30	14.5%	194	18.1%
10 - 25 Acres	15	7.2%	228	21.2%
25 Acres or Larger	9	4.3%	443	41.2%
Total	**207**	**100%**	**1,075**	**100%**



Source: Agencies of City of Las Vegas, City of North Las Vegas, City of Henderson, and Clark County through coordination of SNRPC Land Use Working Group (2008).

Presented below is an estimate of the amount of economically available land for large-bay distribution centers, based on the totals shown above. This estimate is based on the realization that the numbers above are based on acreage available for industrial use irrespective of size, location, and geographical feasibility. Thus, for example, at least conceptually, 25 acres spread across 10 disconnected parcels is mathematically equivalent to one 25-acre parcel of industrial land in a summary. However, these small 10 parcels are not necessarily economically feasible for large-bay distribution centers.

The next step was to examine each individual site that remained from the initial screening mechanism above. The calculations shown below are based on a careful review by members of the Board of Directors of NAIOP who have significant credentials in industrial land use and development of logistics facilities both in Southern Nevada and the Southwest. Each individual site in the table above that consists of at least 10 acres was evaluated for suitability of development. Specifically, the focus was on development of large distribution warehouse buildings of at least 150,000 square feet.

Criteria to exclude sites from development consisted of:

- Incompatible existing or planned uses that preclude development of large distribution buildings;
- Parcels that had topographic constraints or are not properly configured for large distribution buildings;
- Parcels that were valued at the upper end of price, which precludes industrial building development compared to other uses; and
- Acres that were not suitable for distribution building development, because of incompatible surrounding uses.

The data suggests a serious limitation on the potential for larger scale projects associated with large bay warehousing.[3] From this perspective, in approximately five years [2012-2013], development associated with industrial uses in Southern Nevada will begin to face a serious constraint.

Scenario

Large Bay Warehouse/Distribution Feasibility Analysis Economically Viable Parcels Clark County Disposal Area	
Acres suitable for large-bay development	1,360 acres
Historical ratio of land developed with large-bay	.62
Acres anticipated to be developed with large-bay	820 acres
Historical annual acres developed with large-bay	115-150
Remaining time until build-out	5 years – 7 years

This analysis is consistent with the land pricing data presented previously in this report. This pricing data would suggest, as indirect evidence, that "land" *does* have the potential to become a regional economic growth constraint in Southern Nevada as suggested in the table above.

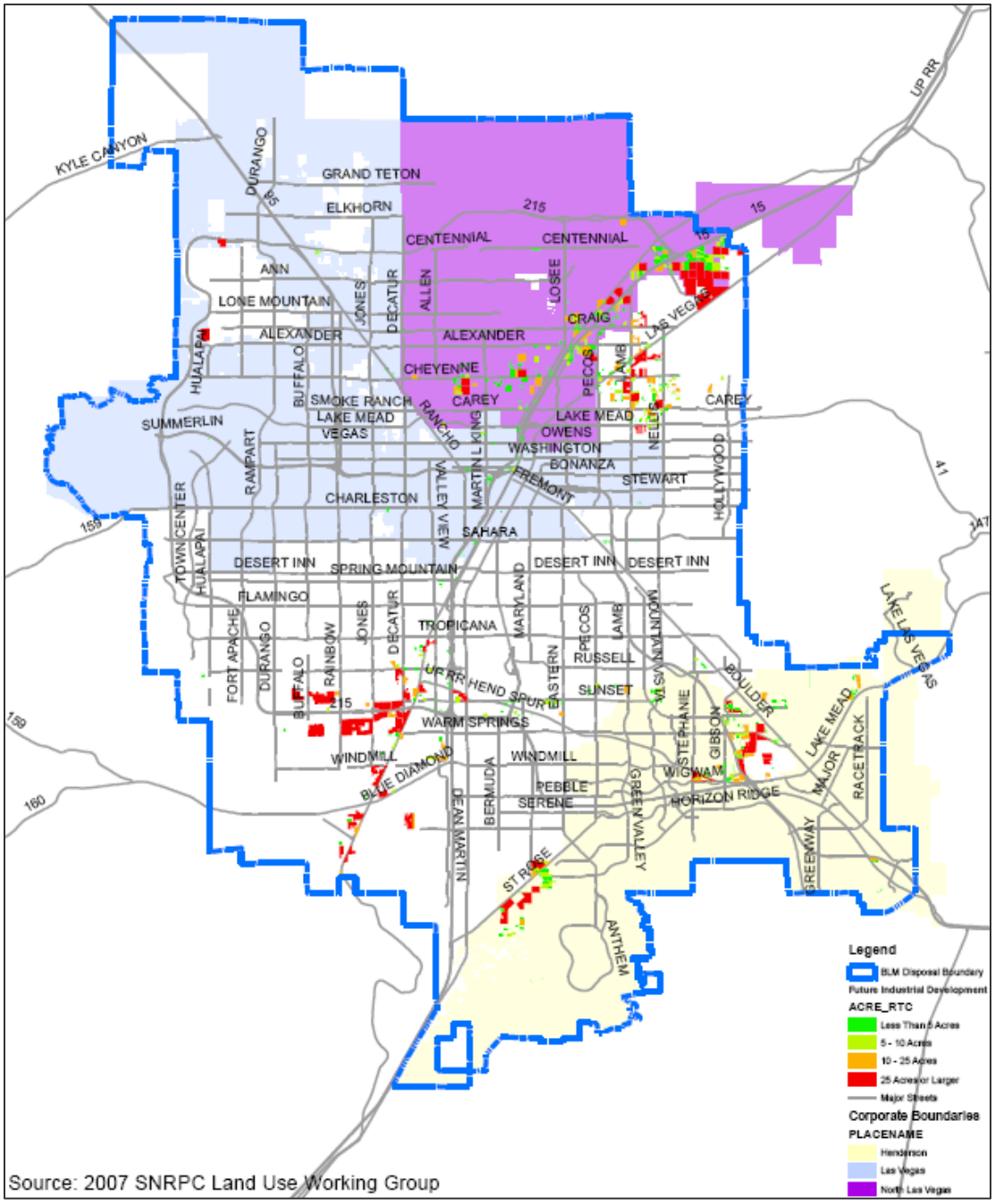
Thus, a potential "island" effect regarding regional distribution or regional goods movement does appear to occur beginning in the 2012-2013 timeframe. Obviously, any such constraint would first be felt in higher business costs before that time. Thus, in the next section we explore the impacts of negative cost conditions on Southern Nevada's economic growth.

[3] *The absorption rates, land use ratios, and other technical data were obtained from NAIOP and Restrepo Consulting Group (RCG) for the NAIOP calculations. RCG is well-recognized in Nevada for its real estate data and market research expertise. See the RCG website (http://www.rcg1.com/).*

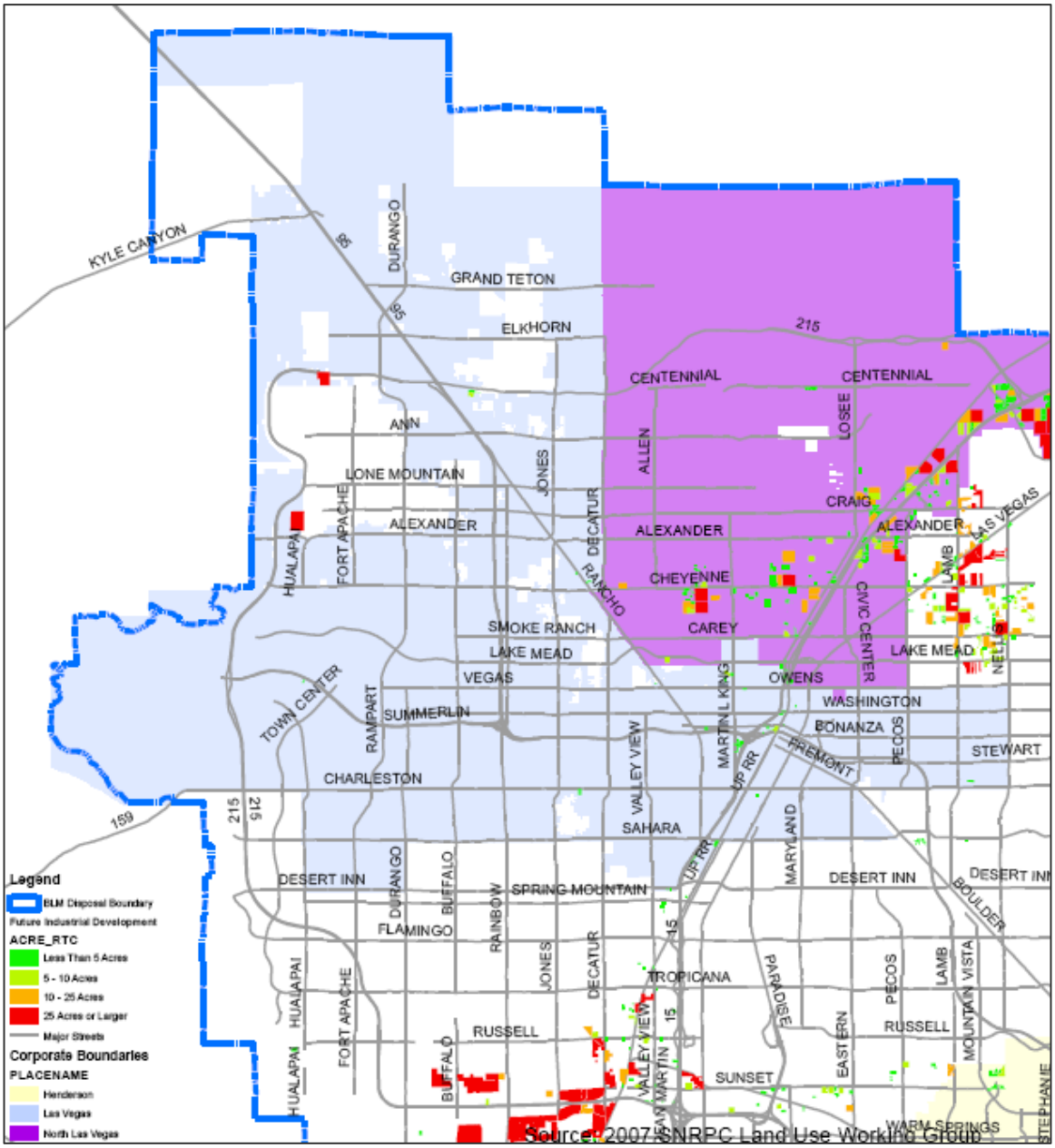
2. MAPS

The following four maps correspond to the exhibits shown above.

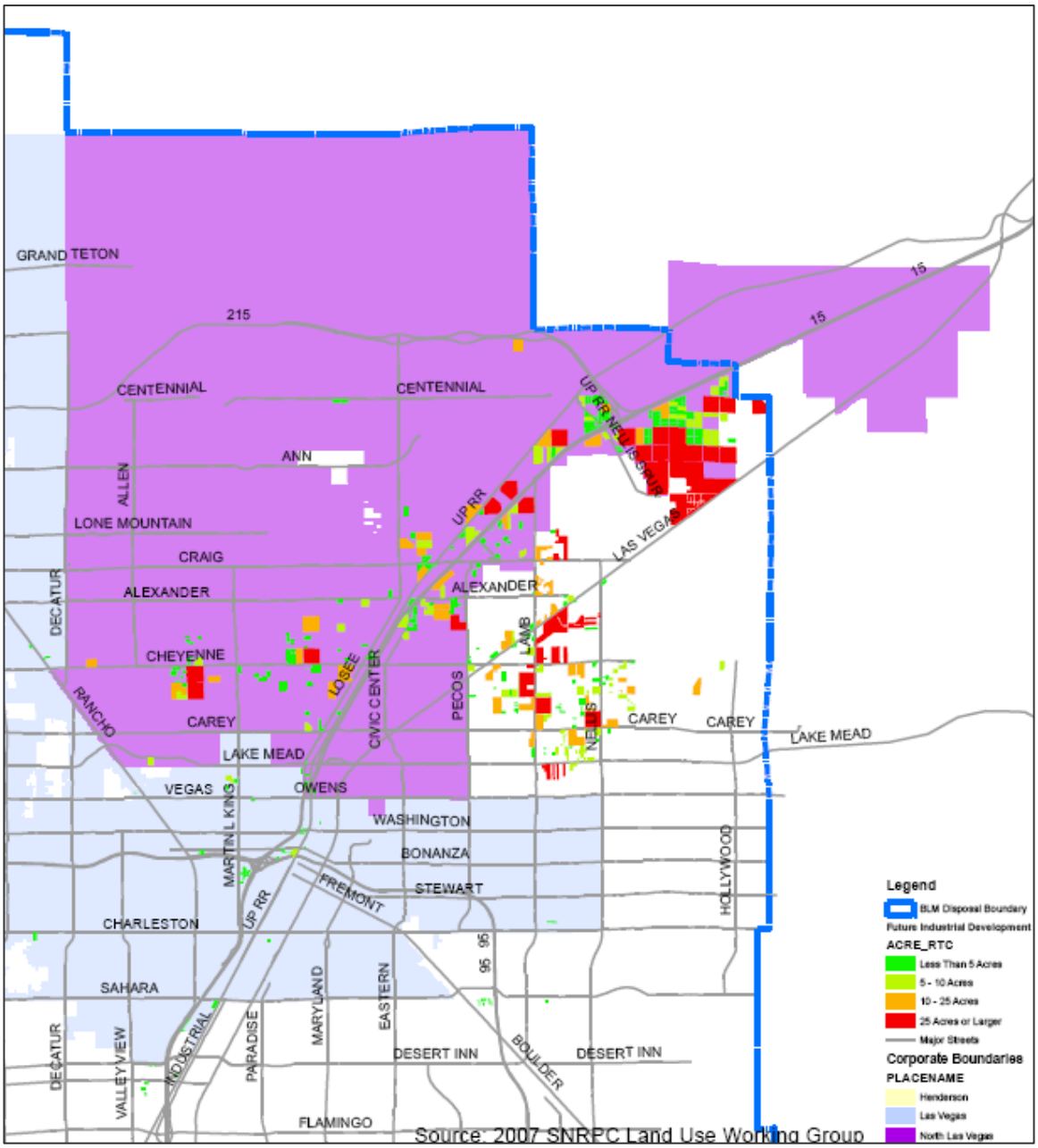
Map V-1: Las Vegas Valley Vacant Industrial Land within the BLM Land Boundary



Map V-2: City of Las Vegas Vacant Industrial Land within the BLM Land Boundary

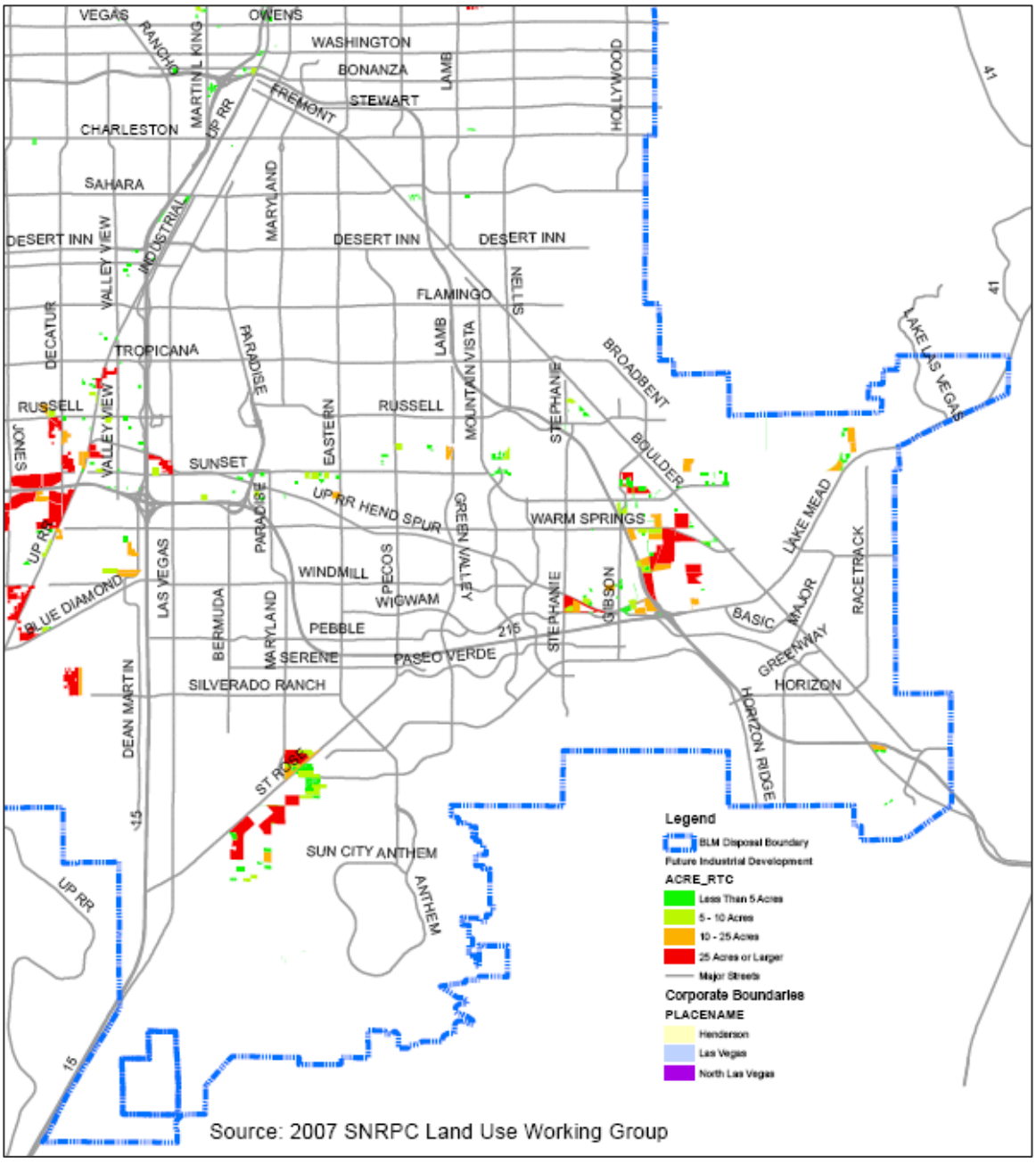


Map V-3: North Las Vegas Vacant Industrial Land within the BLM Land Boundary



Source: 2007 SNRPC Land Use Working Group

Map V-4: Henderson Vacant Industrial Land within the BLM Land Boundary



SECTION VI

IMPACTS ON REGIONAL GROWTH AND INCOME

VI. IMPACTS ON REGIONAL GROWTH AND INCOME

This report has presented analyses in the previous sections of possible limitations on the goods distribution sector in Southern Nevada and their potential implications for the economy of the region. The purpose of this chapter is to formally explore the negative implications of these higher regional cost structures on patterns of regional economic growth and development.

As shown below, the potential negative impacts on Southern Nevada stemming from a regional cost disadvantage in goods distribution are severe and significantly harm the rate of employment, and ultimately, economic growth in our community. *Specifically, the cumulative impacts of what appear to be small cost disadvantages result in major negative regional economic impacts.*

It is critical to point out that the interests of NAIOP in addressing the future of warehousing and distribution centers in Southern Nevada are focused on issues that directly impact the attainment of our community's stated economic goals. Forecasts of regional growth rely on both direct and indirect regional goods movement at "normal" delivered prices and distribution times.

Specifically, this report has addressed five policy issues that directly impact the assumed progress by our community in attaining future economic growth and development. In this regard, the fundamental issues of NAIOP coincide with community economic development concerns and goals. This report has documented that there are five areas that warrant special attention and concern:

1. Southern Nevada faces both a meaningful industrial land shortage and severe price differentials compared to competitors and the "averages" (with respect to prime parcel size and useful locations). Over time, this issue left unaddressed has potentially serious economic growth implications.

2. As noted, the role of warehousing and regional distribution is oftentimes overlooked and underappreciated in economic development. This is particularly true due to important

supplier linkages in industry location decision-making, and proposed cluster development. These linkages are integral to the issue of the final cost of delivered goods.

3. The extensive set of manufacturing activities targeted for economic development in Southern Nevada is dependent upon both just-in-sequence ("JIS") production and JIT production.

4. JIS production and JIT production are most critically related to the two warehousing and distribution metrics of shipping accuracy, on-time shipping (given the obvious assumption of cost containment) and the cost of delivered goods.

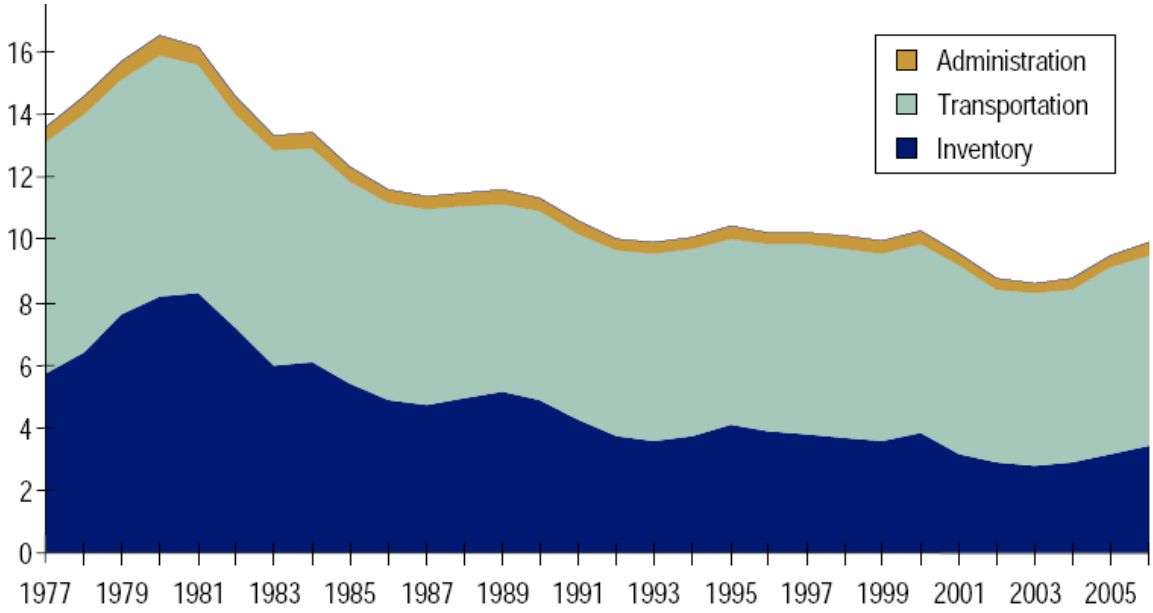
5. Any disruption from national patterns in #s 1-4, above implies significant [negative] alternative growth paths in the number of jobs and the composition of those jobs. This has not generally been recognized either in Southern Nevada or most communities.

As noted, the implications of these potentially negative factors within a traditional regional economic model of growth and development are analyzed herein.

An overview of logistics costs through 2005 is presented in the exhibit below. As shown, logistics costs fell from the figure of 16% of U.S. gross domestic product in the 1970s due to ameliorating fuel prices and new infrastructure investments.[1] However this trend reversed by 2006 to rise back to approximately 10%. Current estimates in 2008 suggest that figures may be trending towards the possibility of new record highs approaching 20%.[2] There appears to be little recognition of the impact of these potentially higher costs on forecasts of regional growth and income.

[1] *See Rosalyn Wilson, State of Logistics Report, Council of Supply Chain Management Professionals, 2006 and 2007.*
[2] *Presentations at 2008 Annual Conference, Intermodal Distribution Associations; TRI was a featured speaker.*

Exhibit VI-1
U.S. Total Logistics Cost
Percentage of Gross Domestic Product: 1977 - 2006



Source: State of Logistics Report, Council of Supply Chain Management Professionals, 2006.

1. MODELING APPROACH

The U.S. input-output model is a detailed categorization of the national economy by sector and commodity use, with a regional approach to the input –output model structure contained in a regional version often referred to as Regional Industrial Multiplier System ("RIMS").[3] One of the major sectors included is transportation and warehousing. Using these coefficients and the cost issues discussed in this report, a conservative range of potential cost disadvantages in logistical costs were computed.

As discussed above, basic assumptions include: (1) that the clear upward trend in logistics costs may trend to 16% -20% of gross product, (2) Nevada fuel surcharges for basic haulage contracts continue at multiplier levels/factors of 1.37 surcharges, or will fall to a previous high range of

[3] *Detailed discussion of individual sectors is available at the analytical website of the US input-output benchmark system at: http://www.bea.gov/industry/io_benchmark.htm#2002data. The RIMS system is described at www.bea.gov/regional/rims.*

1.31, and (3) land restrictions result in an inability to have viable regional distribution systems in Southern Nevada.

Under these assumptions, our calculations suggest a conservative potential increase in a cost disadvantage for Southern Nevada relative to national norms of 5%.[4] In general, a conservative cost range of possible disadvantage is from 3%-7% with a possible 10% upper figure shown below for illustrative purposes. However, we will specifically present the detailed results for the 5% in this section (with detailed charts for other cases shown in the appendix).

It is interesting to note that, for example, 5% does not appear to be a "large" percentage disadvantage. Thus, does this level of disadvantage really matter to a community since it appears to be "small"? In simple terms, would it matter much compared to a dramatic figure?

Specifically, what are the impacts on the critical regional dimensions of employment, per capita personal income, population, and manufacturing employment of these cost disadvantages? How do results change from an assumed base case where Southern Nevada mirrors the national economy?

What is often not recognized is that any cost disadvantage is not just related to the more obvious direct effect of the disadvantage. The indirect impacts on suppliers, households, and new business formation can often be as important. For example, the SNRPC recently discussed the need for industrial land as a strategic element required as part of the structural foundation of successful business cluster development in Southern Nevada.[5]

Thus, the total impacts are not a simple measurement - but the cumulative impacts of a series of economic interactions between the business sector, consumers, and households.[6]

In order to model these effects, TRI used the integrated multisector regional modeling system often referred to simply as REMI (Regional Economic Model, Inc.).[7] The REMI model is

[4] *Other assumptions follow the discussions in Section I and Section V of this report.*
[5] *SNRPC (2008) Strategies and Recommendations for Cluster Development in Southern Nevada, TRI.*
[6] *It is often difficult to model the "equilibrium" of such a system as opposed to taking a simple snapshot of a single sector.*

extensively used in Southern Nevada as the basis for population projections, growth forecasts, etc. [8] The systems approach in the model allows the "equilibrium" of a specific single sector issue to be explored as opposed to taking a simple snapshot of a single sector. The inter-sector interaction allows the full impacts of individual changes to be captured within the regional economy.[9] The forecast period presented below is for the period 2012-2035.

2. RESULTS

Presented below are the results of our computed cost disadvantages to the Southern Nevada economy due to warehousing and distribution costs that are above the national trend by 5%.

Results below are presented for five regional dimensions of interest. These dimensions are:

- Employment
- Per Capita Income
- Population
- Manufacturing Employment
- Scientific Professional Employment (Life sciences, physical scientist, etc.)

Employment, per capita income, and population are, of course, the major three dimensions of regional growth and measurement often noted in economic forecasts.

The other two economic variables - manufacturing employment and scientific professional employment - relate to the often discussed Southern Nevada goal of economic diversification and future business development.

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[7] *The REMI model is explained in detail with illustrations and papers from conferences, etc. at http://www.remi.com/.*

[8] *For example, see the recent Population Forecasts: Long-Term Projections for Clark County, Nevada 2008-2035, Center for Business and Economic Research, UNLV. Modeling access to the Clark County REMI system was provided through CBER.*

[9] *Technical evaluations of the REMI model are available in "Regional Shares of Local and National Markets: The Role of Productivity, Costs and Profits ", G.I. Treyz and D.S. Rickman; "Advanced Features of the REMI Model Chart"; "Applications of the REMI Model", Glenn Weisbrod, Annual REMI Conference; "Geographic Concentration of US Manufacturing Industries", G. Ellison and E. L, Glaeser. All of these papers are available at the REMI website.*

Details of the results are presented in the series of tables and graphs below. Rather than immersing the discussion in the detailed results, we will point out several implications of the results for economic development of Southern Nevada:

- Although regional distribution (warehousing and transportation) is not seen by many as an "exciting" topic compared to sectors such as biotechnology, a lack of competitive distribution facilities has major negative impacts on future employment growth in Southern Nevada and per capita income in Southern Nevada.

- A relatively small cost disadvantage of 5% generates a 12% average annual reduction over the forecast period from the anticipated (or "normal base") number of jobs (Exhibit VI-2a), and 13% in the level of per personal capita income (Exhibit VI-3a) in Southern Nevada. This is due to the interactive effects and cumulative impacts resulting from the disadvantage.

- The projected negative impacts on per capita income during the forecast period are a source of serious concern. The fall in projected levels of manufacturing employment and professional employment drag down this economic dimension of our community more than the other variables. In general, the magnitude of these negative changes is more than twice the assumed cost disadvantage.

- Relative to the impacts on Southern Nevada's population, a 5% cost disadvantage reduces the average annual rate of population growth by 8% from the base estimate during the study period.

- The manufacturing sector (and thus targeted cluster development) suffers major shortfalls (an annual average of 15%) from the projected jobs gains in this sector over the forecast period.

- Absolute (e.g., number of jobs) growth projections of scientific professional employment fall significantly. For example, a cost disadvantage of 5% for Southern Nevada reduces

the expected number of these employees by an annual average of 11% during the projection period.

To summarize, the cumulative negative impacts of a non-competitive logistics situation in Southern Nevada significantly exceed the direct percent cost disadvantages.

The detailed results are presented in the pages that follow in graphical form. Each of the five economic variables of interest is first shown, individually, assuming that the Southern Nevada economy mirrors the national set of REMI assumptions. The forecast period goes until the year 2035.

The impact of higher logistics costs in the forecasts below is modeled to begin to occur 2012, reflecting the eventual negative impact of land constraints on regional warehousing and distribution. This is particularly true for the best sites as they are likely to absorbed over the next four years to five years.

The normal "base" economic forecast is consistent with recent discussions of the Southern Nevada economy.[10] Growth in all five economic variables is positive, even if at a lower rate of growth than the historical explosive growth seen in Southern Nevada, especially the last 20 years.

The five Southern Nevada economic variables are shown separately from 2012 to 2035 as the first figure (in grey) in each series. Each grey chart is then followed by a scenario that shows what would happen if Southern Nevada had a cost disadvantage of 5% above the national trend cost scenario. This is shown as percentage (negative) changes from the expected absolute number (e.g., new manufacturing jobs) for each variable each year. As illustrated, the negative impact to each variable increases over time, because of the ongoing interaction of all sectors of

[10] *The normal base economic forecast presented here varies from others presented elsewhere due to several factors. It is based on an unconstrained base set of assumptions within the REMI structure. Other discussions of the Southern Nevada economy have utilized special factors for amenity costs, special adjustments for hotel construction, reconciliation procedures for population based upon what are known as postal count methods, etc. The primary point is to recognize that the negative percentages presented in this report are consistent across adjustments to the base set of model assumptions. Thus, other alternative forecasts can also be interpreted as having similar negative impacts.*

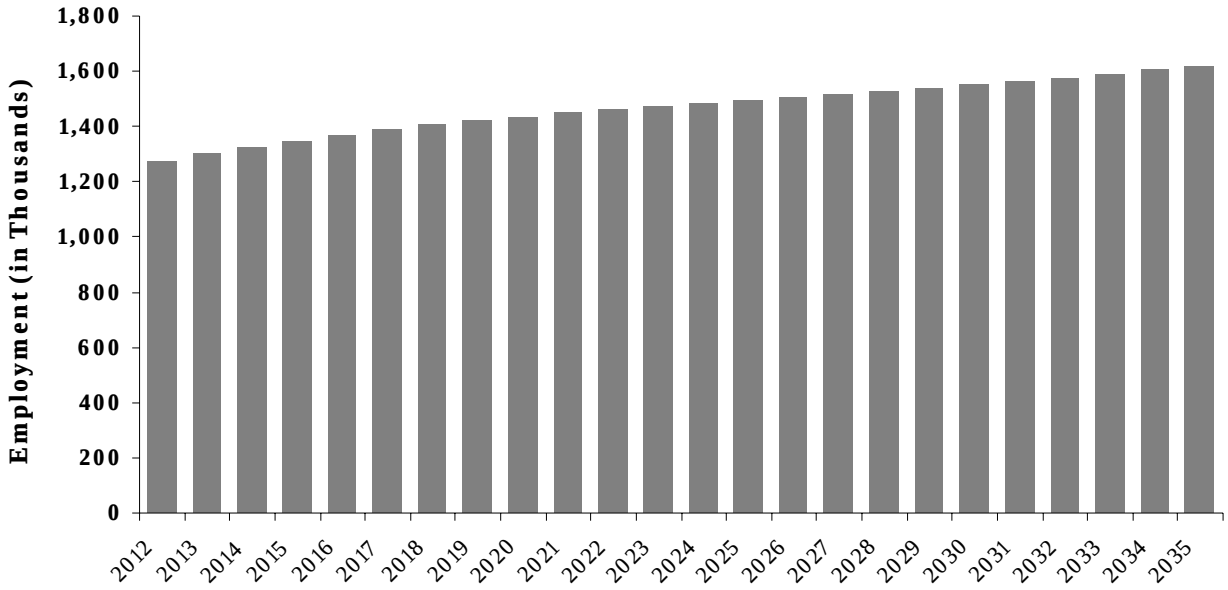
the Southern Nevada economy, and the fact that reduced rates of growth in manufacturing, scientific professional employment, etc. negatively impact total employment growth (and, thus, population) over time.

Total Employment

Base Forecast

The following exhibit shows the forecast of total employment in Southern Nevada, based on the assumption that Southern Nevada maintains the same relative competitive position to compared areas, such as Southern California, Arizona, etc.

Exhibit VI-2a

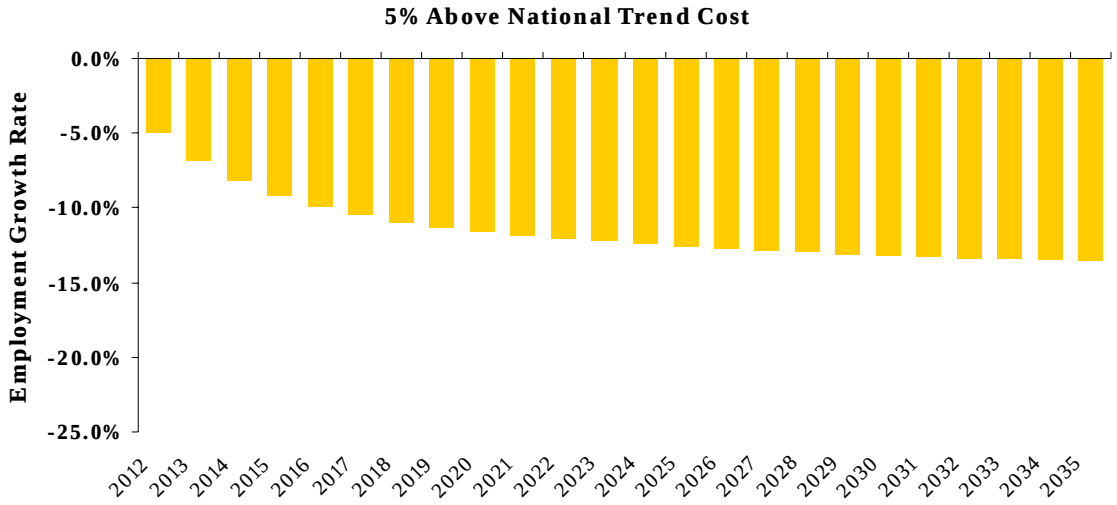


Southern Nevada Total Employment Projections: 2012 - 2035

Higher Cost Forecast

The following graph presents the reductions to the base employment figures in Exhibit IV-2a, because of a 5% cost disadvantage above the national trend cost. As shown, the total number falls much more than one might expect within a true multi-regional and multi-industry forecasting model.

Exhibit VI-2b
Southern Nevada Warehousing and Transportation Cost Impact on Total Employment Growth - 5% Above National Trend Cost: 2012 – 2035



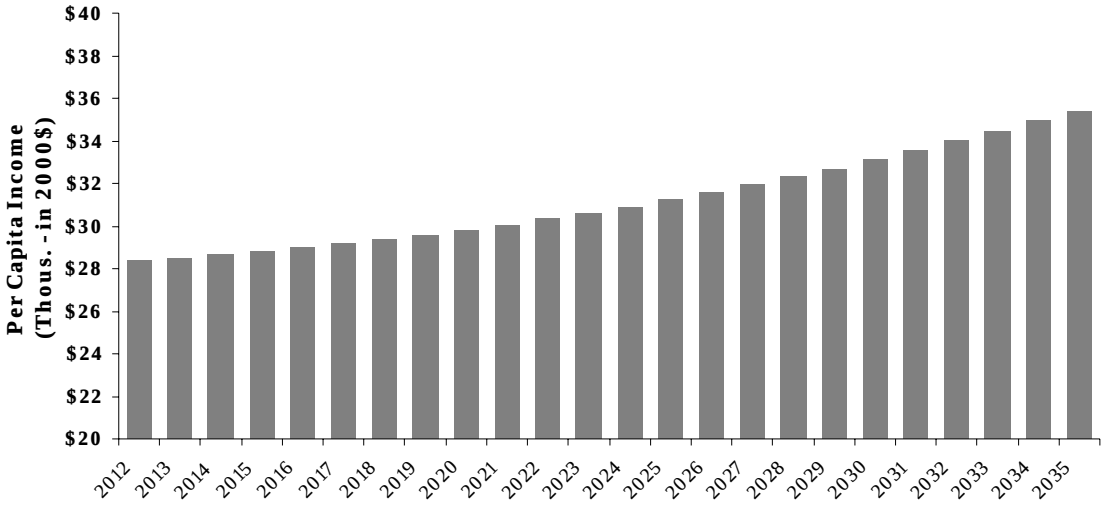
Note: For example, a 5% cost disadvantage in 2016 for Southern Nevada reduces by 10% the number of total new jobs (Exhibit VI-2a) expected to be created that same year had the region maintained its relative competitive position to areas, such as Southern California, Arizona, etc.

Personal Per Capita Income

Base Forecast

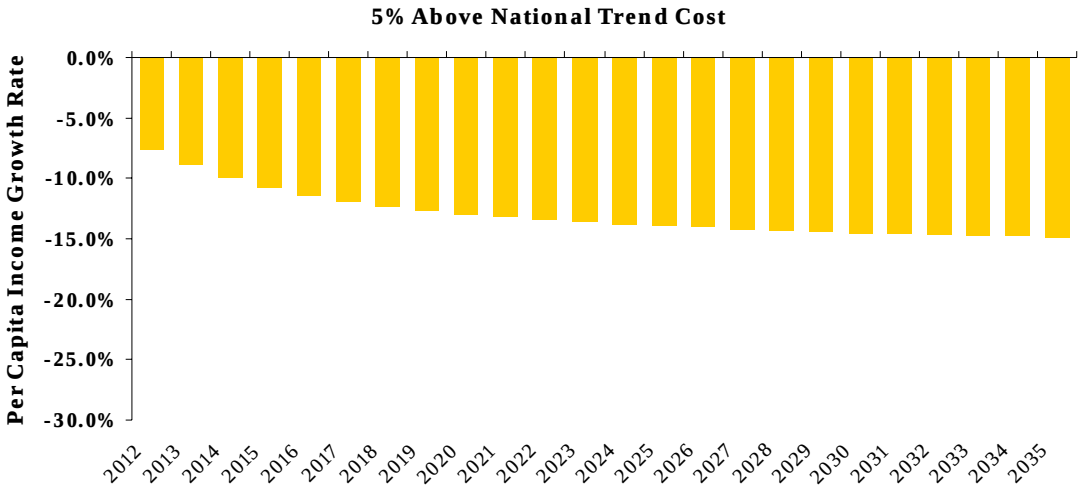
The following exhibit shows the forecast of total personal per capita income in Southern Nevada, based on the assumption that Southern Nevada maintains the same relative competitive position to areas, such as Southern California, Arizona, etc.

Exhibit VI-3a
Southern Nevada Real Disposable Personal Income Projections: 2012 - 2035



Higher Cost Forecast

Exhibit VI-3b
Southern Nevada Warehousing and Transportation Cost Impact on Real Disposable Personal Per Capita Income Growth - 5% Above National Trend Cost: 2012 – 2035



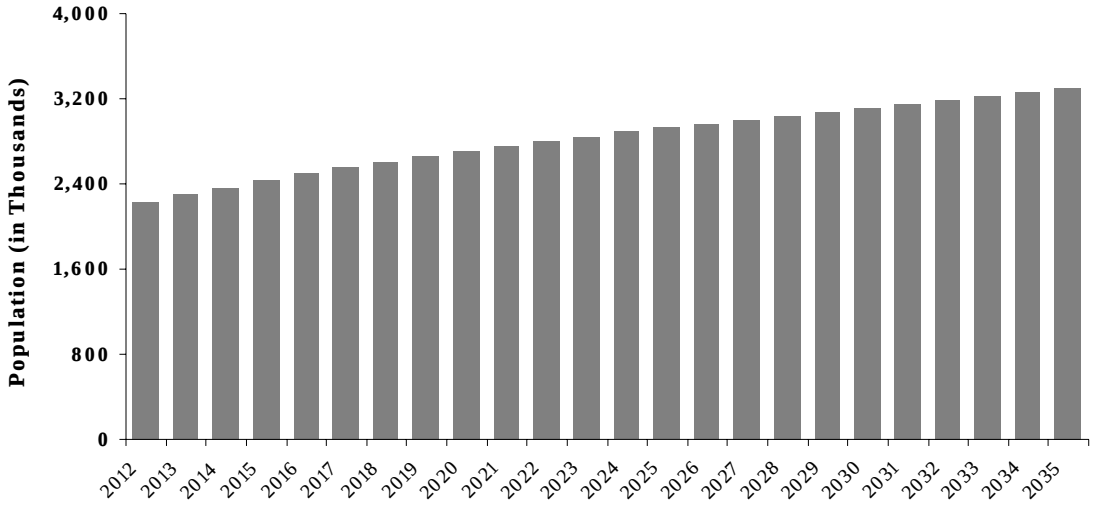
Note: For example, a 5% cost disadvantage in 2014 for Southern Nevada reduces by 10% real disposable personal per capita income (Exhibit VI-3a) expected to be generated that same year had the region maintained its relative competitive position to areas, such as Southern California, Arizona, etc.

Population

Base Forecast

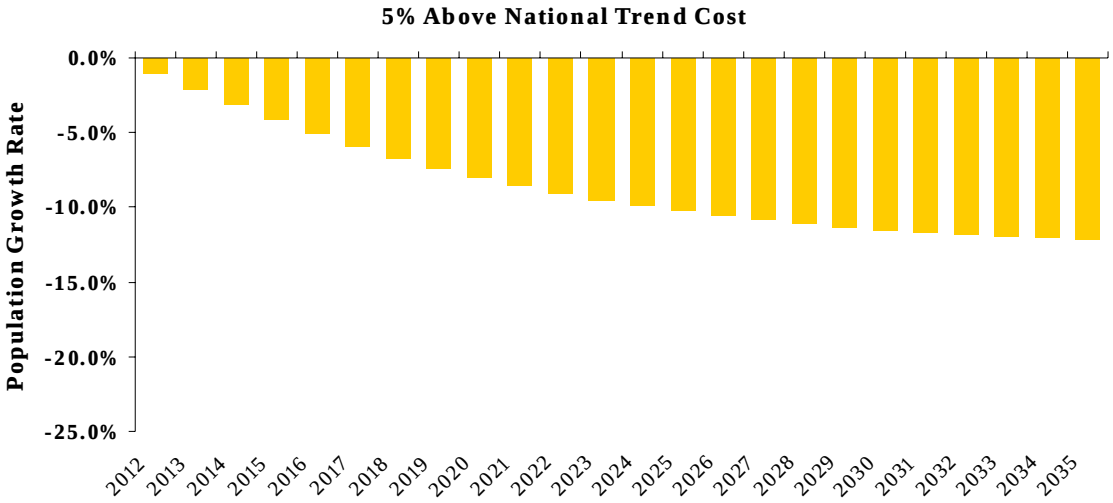
The following exhibit shows the forecast of total population in Southern Nevada, based on the assumption that Southern Nevada maintains the same relative competitive position to areas, such as Southern California, Arizona, etc.

Exhibit VI-4a
Southern Nevada Population Projections: 2012 - 2035



Higher Cost Forecast

Exhibit VI-4b
Southern Nevada Warehousing and Transportation Cost Impact on Population Growth - 5% Above National Trend Cost: 2012 – 2035



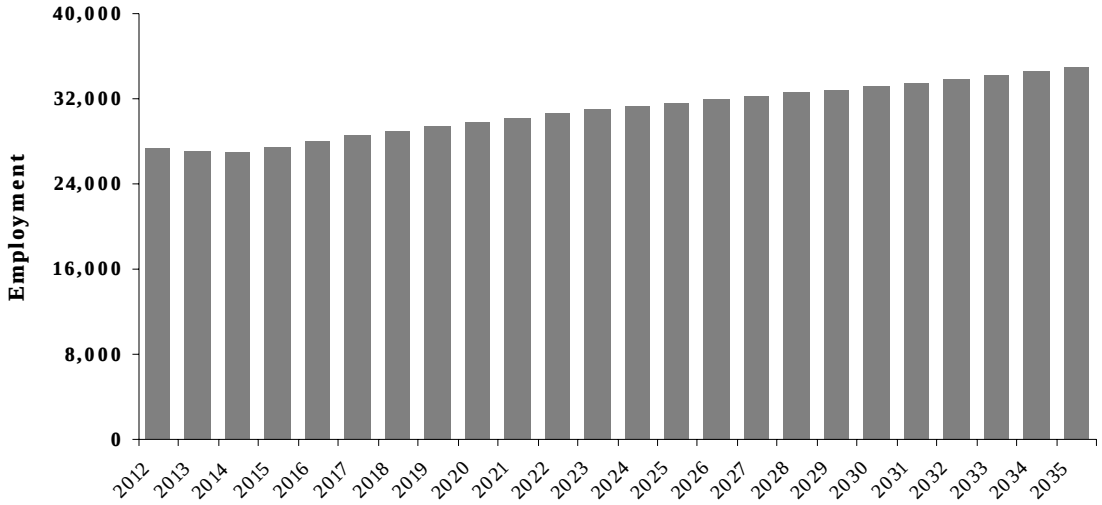
Note: For example, a 5% cost disadvantage in 2024 for Southern Nevada reduces by 10% the number of new residents (Exhibit VI-4a) expected to be added that same year had the region maintained its relative competitive position to areas, such as Southern California, Arizona, etc.

Manufacturing Employment

Base Forecast

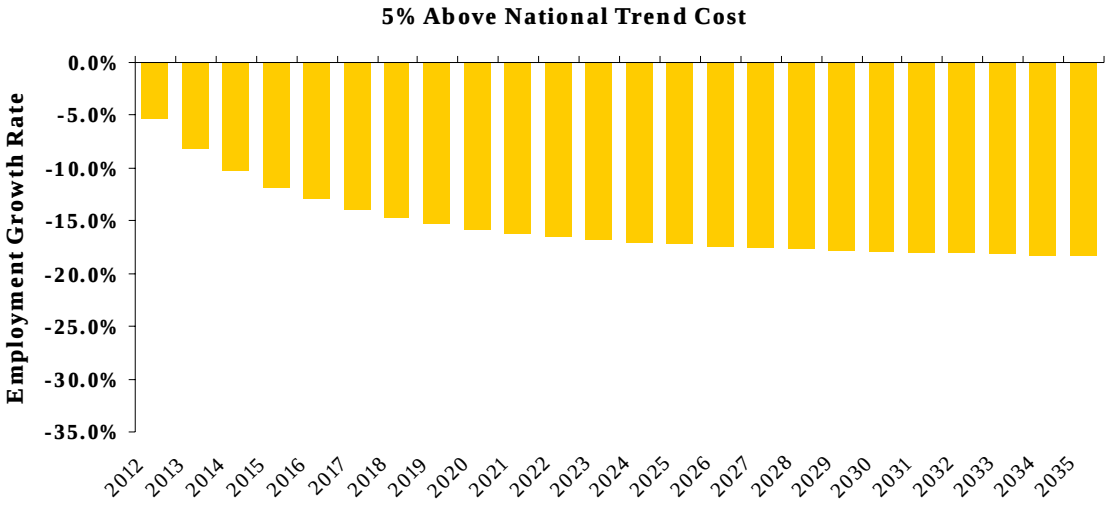
The following exhibit shows the forecast of manufacturing employment in Southern Nevada, based on the assumption that Southern Nevada maintains the same relative competitive position to areas, such as Southern California, Arizona, etc.

Exhibit VI-5a
Southern Nevada Manufacturing Employment Projections: 2012 - 2035



Higher Cost Forecast

Exhibit VI-5b
Southern Nevada Warehousing and Transportation Cost Impact on Manufacturing Employment Growth - 5% Above National Trend Cost: 2012 – 2035



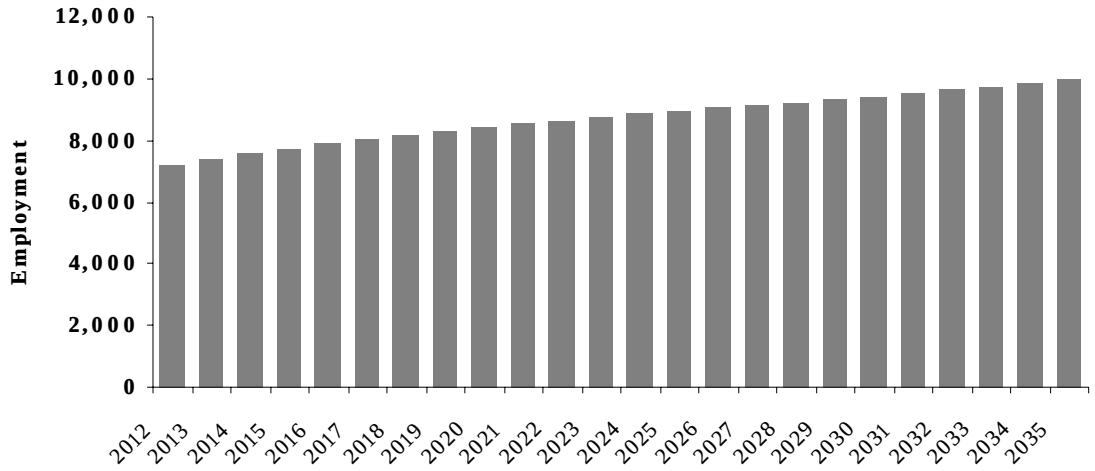
Note: For example, a 5% cost disadvantage in 2014 for Southern Nevada reduces by 10% the number of new manufacturing jobs (Exhibit VI-5a) expected to be created that same year had the region maintained its relative competitive position to areas, such as Southern California, Arizona, etc.

Scientific Professional Employment

Base Forecast

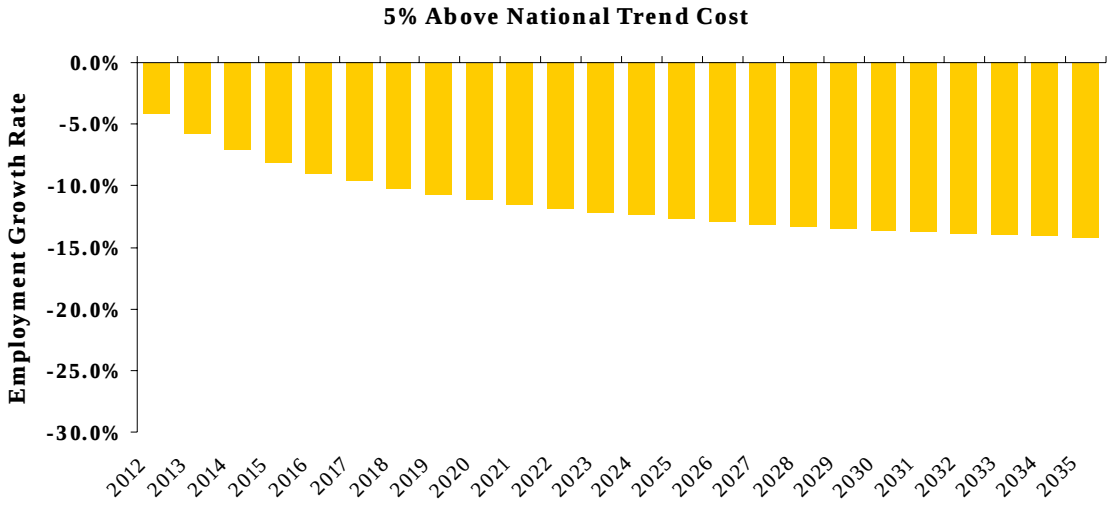
The following exhibit shows the forecast of scientific professional employment in Southern Nevada, based on the assumption that Southern Nevada maintains the same relative competitive position to areas, such as Southern California, Arizona, etc.

Exhibit VI-6a
Southern Nevada Scientific Professional Employment Projections: 2012 - 2035



Higher Cost Forecast

Exhibit VI-6b
Southern Nevada Warehousing and Transportation Cost Impact on Scientific Professional Employment Growth - 5% Above National Trend Cost: 2012 – 2035



Note: For example, a 5% cost disadvantage in 2017 for Southern Nevada reduces by 10% the number of new scientific professional jobs (Exhibit VI-6a) expected to be created that same year had the region maintained its relative competitive position to areas, such as Southern California, Arizona, etc.

SECTION VI APPENDIX
MODEL FORECASTS

RESULTS OF FOUR COST SCENARIOS

Presented below are the results of our computed cost disadvantages to the Southern Nevada economy due to warehousing and distribution costs that are above the national trend by 3%-10%. These are presented as four scenarios:

1. 3%-Low Estimate
2. 5%
3. 7%
4. 10% -Upper Limit

Results below are presented for five regional critical factors, including:

1. Employment
2. Per Capita Income
3. Population
4. Manufacturing Employment
5. Scientific Professional Employment (Life sciences, physical scientist, etc.)

Employment, per capita income, and population are, of course, the major three components of regional growth often noted in economic forecasts.

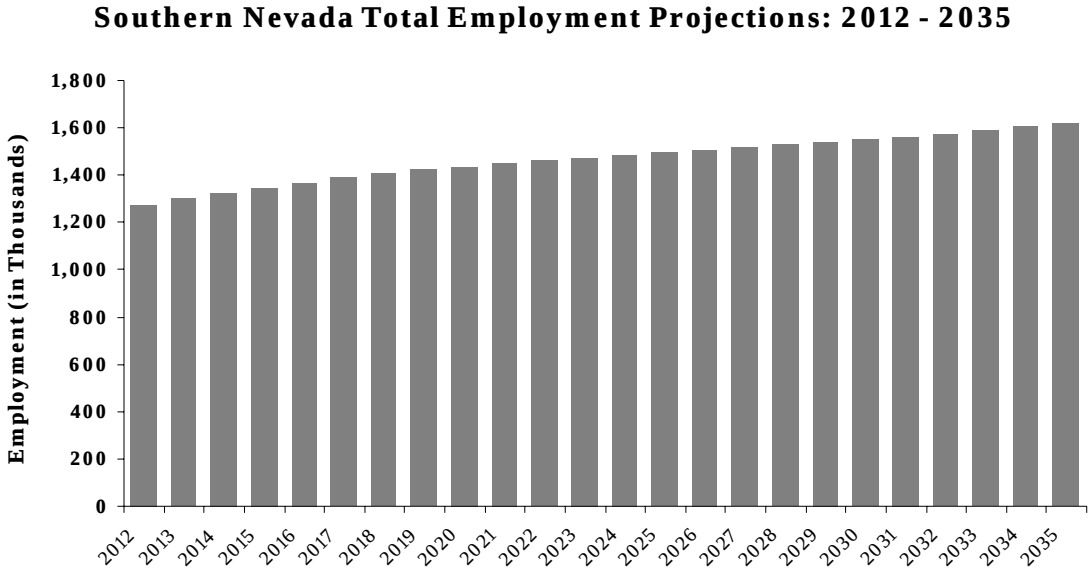
The other two economic variables - manufacturing employment and scientific professional employment - relate to the often discussed Southern Nevada goal of economic diversification.

The anticipated or "normal base" economic forecasts (grey charts) reflect results that are consistent with recent discussions about the Southern Nevada economy.[11] Growth in all five economic variables is positive, even if at a lower rate of growth than past explosive growth.

[11] *The normal base economic forecast presented here varies from others presented elsewhere due to several factors. It is based upon an unconstrained base set of assumptions within the REMI structure. Other discussions of the Southern Nevada economy have utilized special factors for amenity costs, special adjustments for hotel construction, reconciliation procedures for population based upon what are known as postal count methods, etc. The primary point* is to recognize that the negative percentages presented in this report are consistent across

Each economic variable is shown separately from 2012 to 2035 in the first chart (in grey). This is then followed by the four higher cost scenarios shown as (negative) percentage changes from the base economic forecast. As illustrated below, the negative impact for any given year increases over time due to the interaction of all sectors in the Southern Nevada economy over time, and the fact that a decline in the anticipated number of new manufacturing and scientific professional jobs, etc. will also adversely impact total employment (and, thus, population).

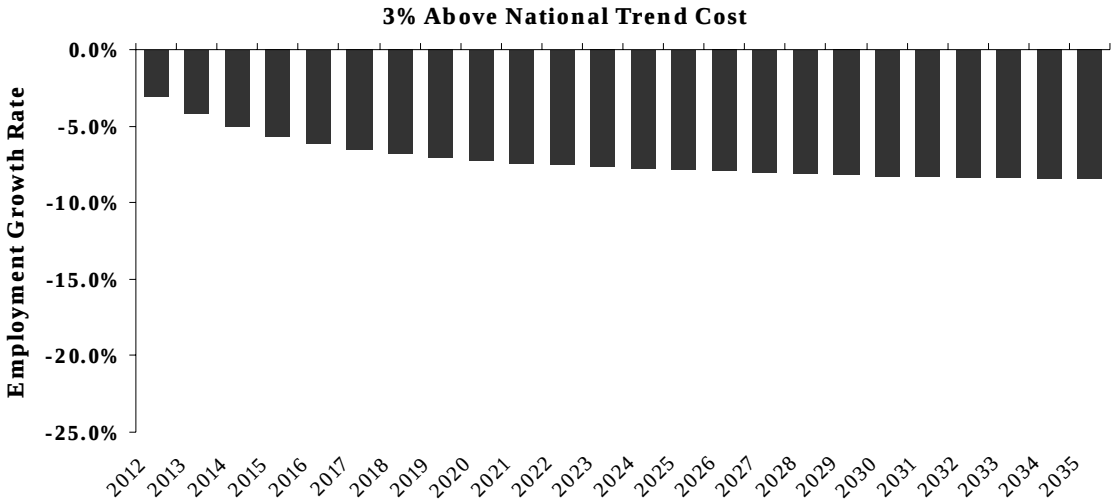
Normal Base Total Employment

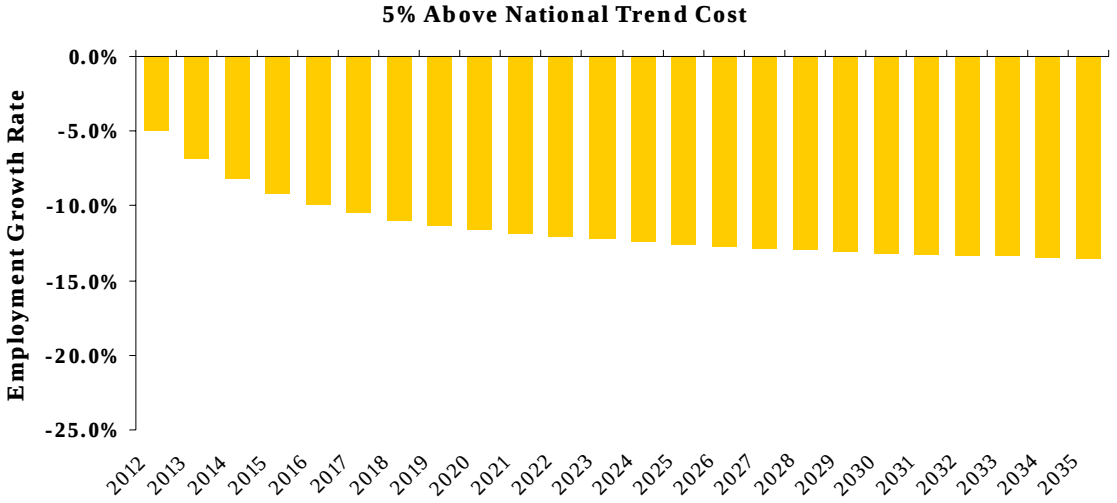


The following four graphs present the impacts (negative) on annual job growth, resulting from various cost disadvantage scenarios above the national trend cost, compared to the normal base population figures above. For example, a 3% cost disadvantage in 2014 for Southern Nevada relative to the national trend cost reduces by 5% the number of jobs expected to be added to the region's normal base of jobs in 2014, as illustrated above.

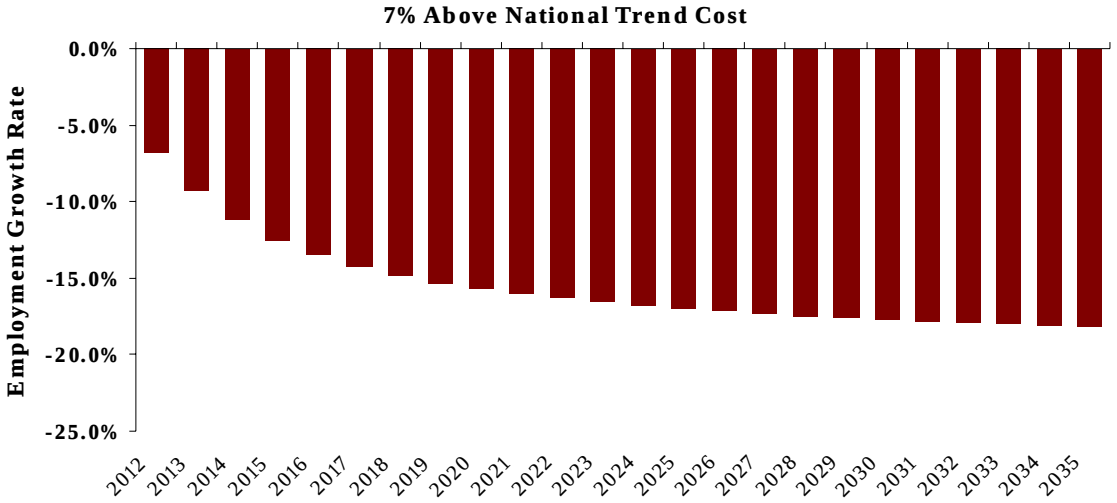
adjustments to the base set of model assumptions. Thus, other alternative forecasts can also be interpreted as having similar negative impacts.

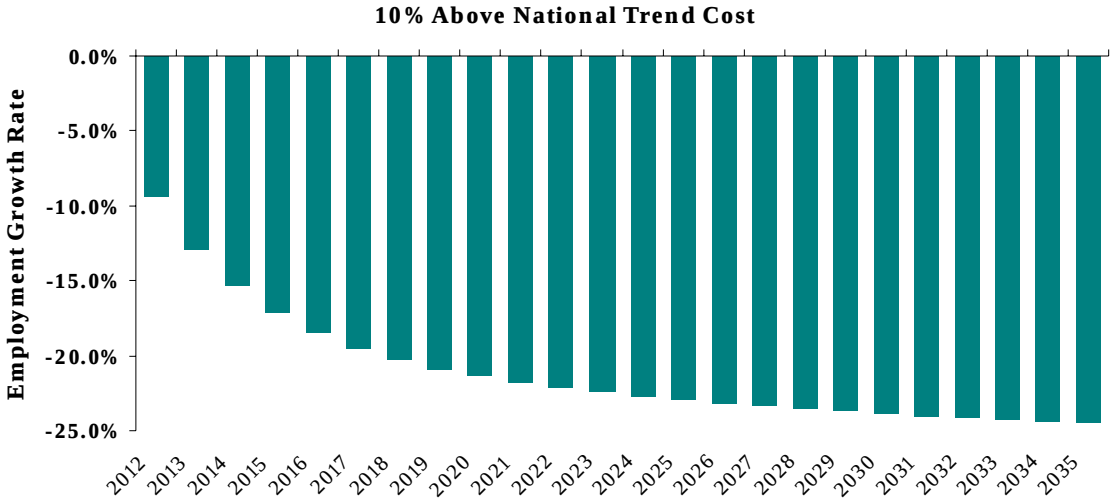
Southern Nevada Warehousing and Transportation Cost Impact on Total Employment Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035





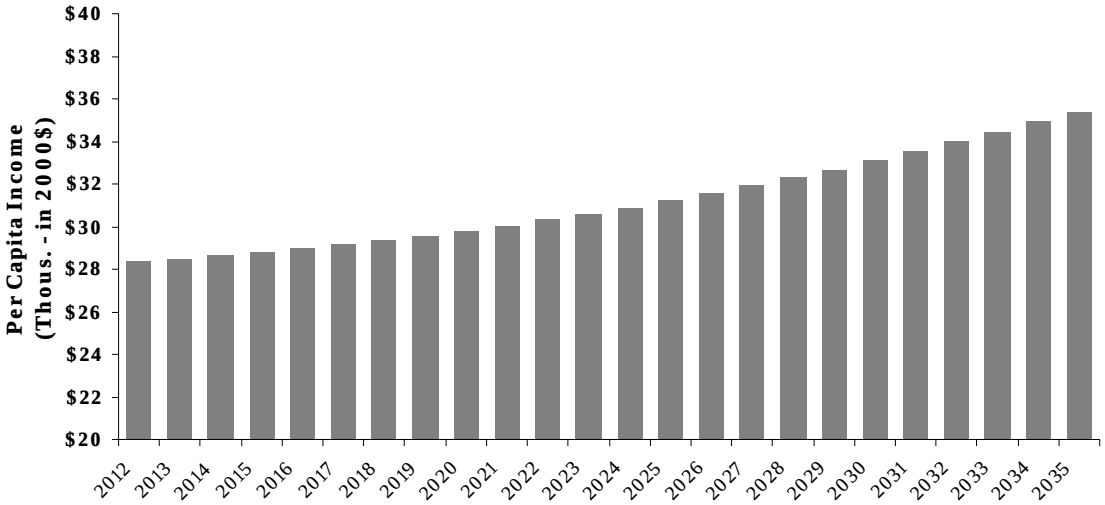
Southern Nevada Warehousing and Transportation Cost Impact on Total Employment Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035 (continued)





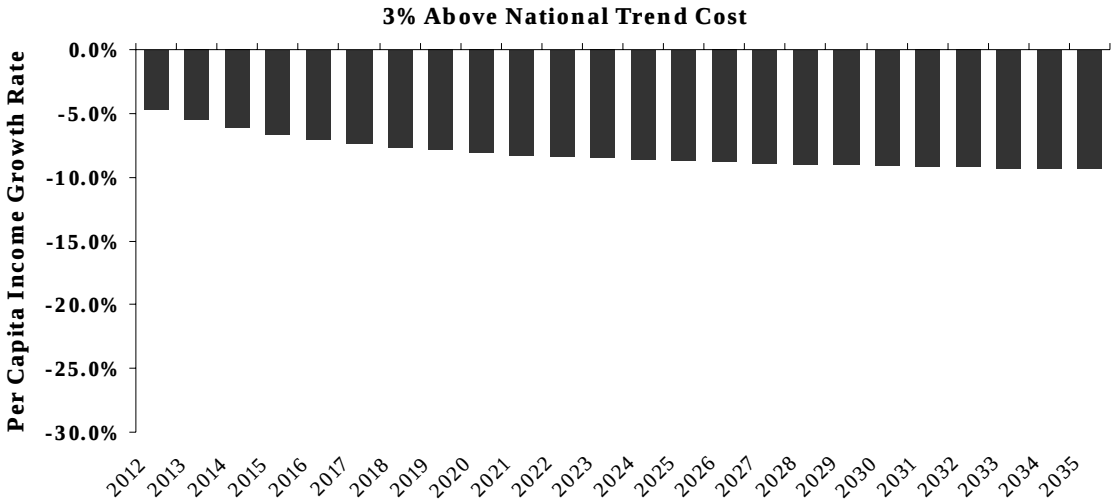
Normal Base Per Capita Income

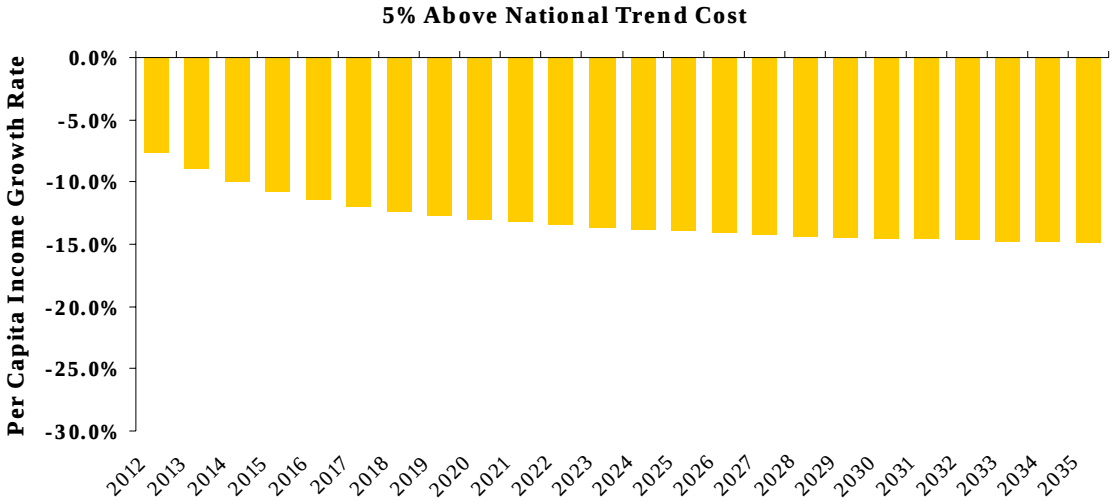
Southern Nevada Real Disposable Personal Income Projections: 2012 - 2035



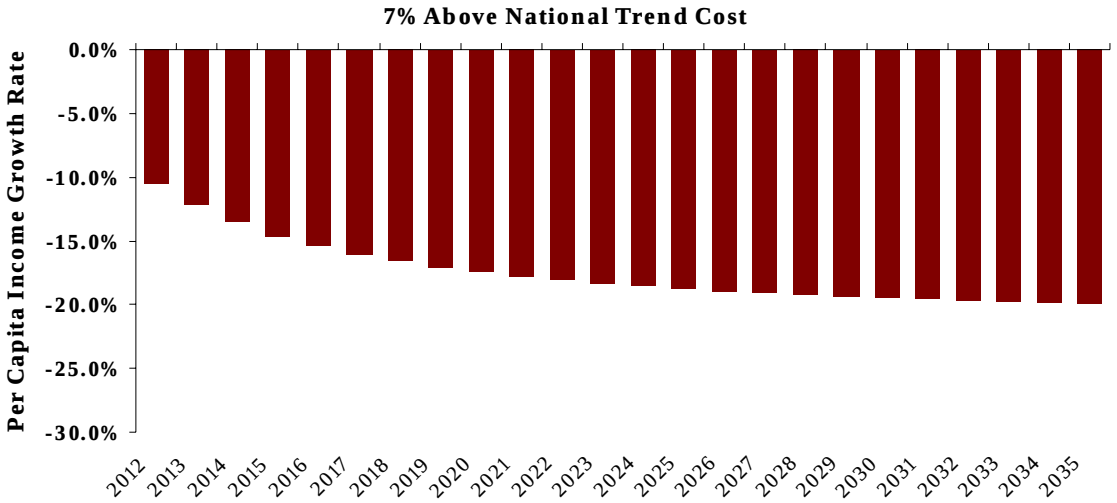
The following four graphs present the impacts (negative) on annual personal per capita income growth, resulting from various cost disadvantage scenarios above the national trend cost, compared to the normal base per capita income figures above. For example, a 3% cost disadvantage causes projected per capita income in Southern Nevada to be reduced by just under 5% in 2012.

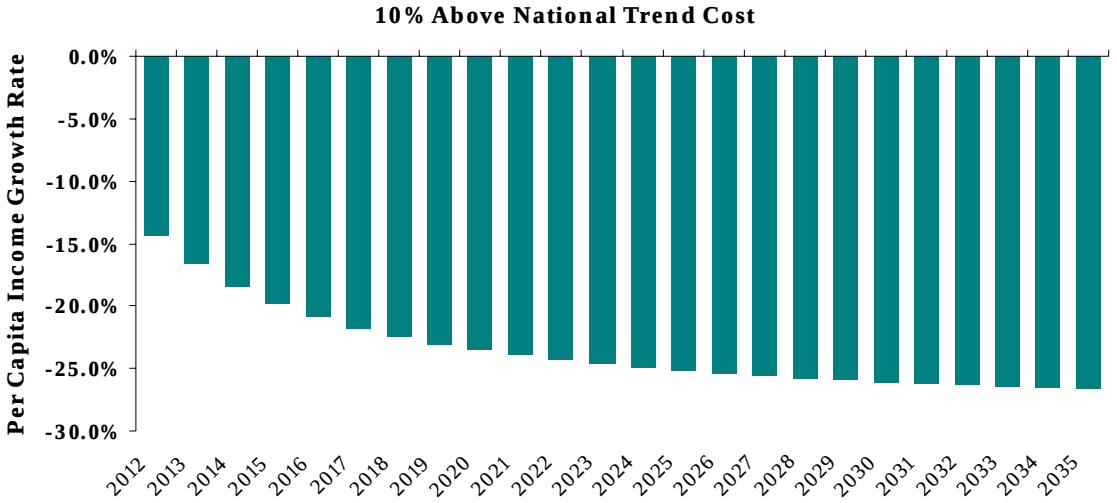
Southern Nevada Warehousing and Transportation Cost Impact on Real Disposable Personal Income Growth - 3% 5%, 7% and 10% Above National Trend: 2012 – 2035



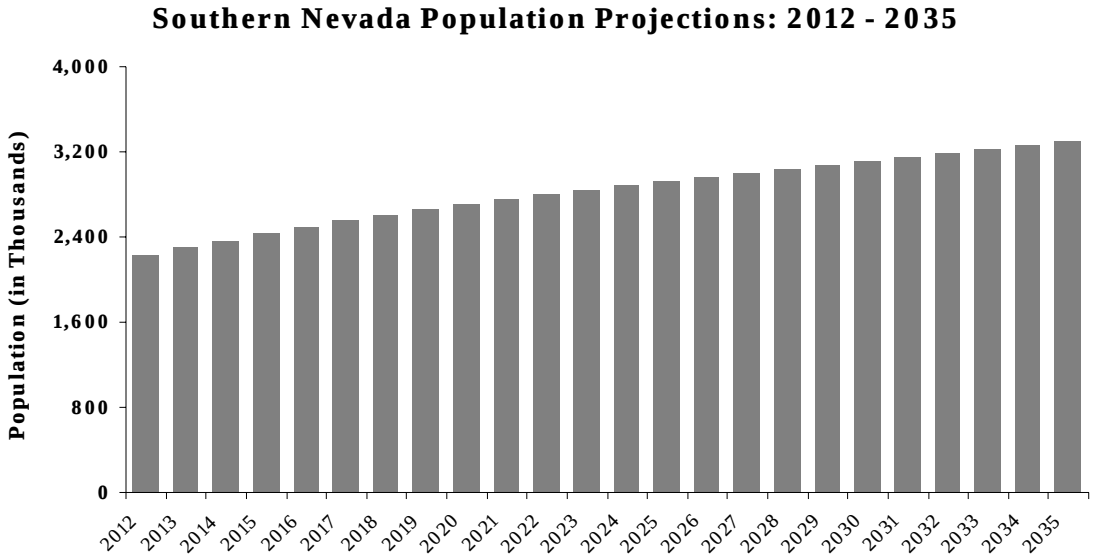


Southern Nevada Warehousing and Transportation Cost Impact on Real Disposable Personal Income Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035 (continued)



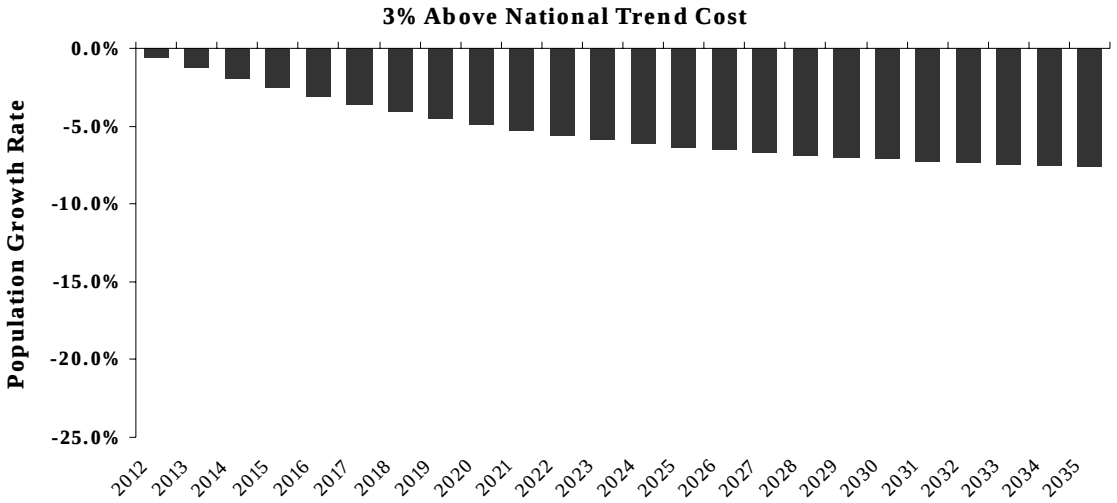


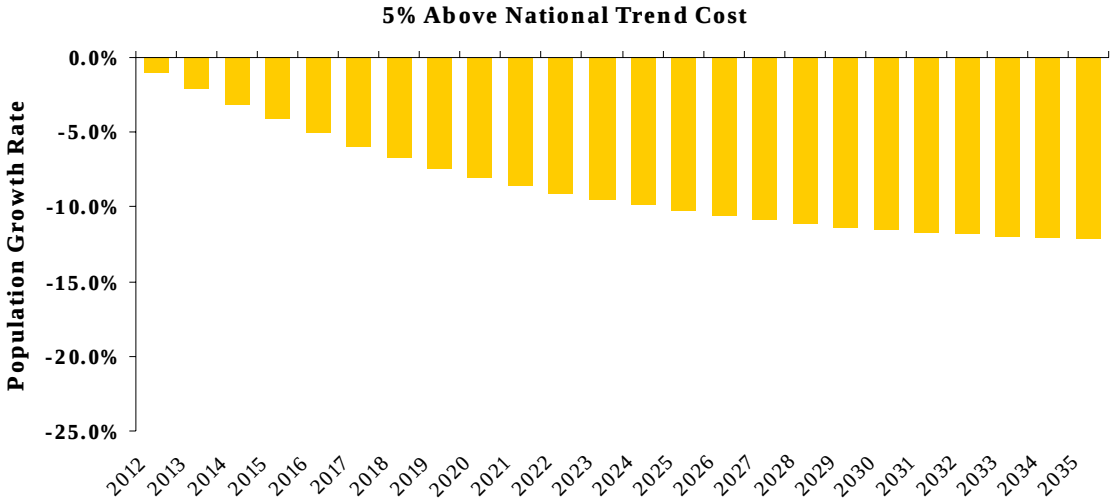
Normal Base Population



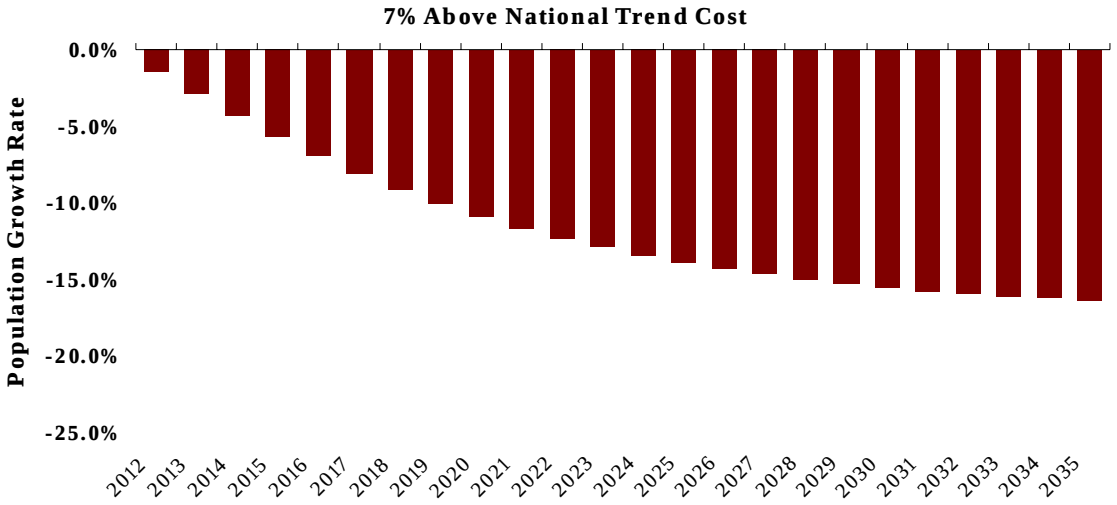
The following four graphs present the impacts (negative) on annual population growth, resulting from various cost disadvantage scenarios above the national trend cost, compared to the normal base population figures above. For example, a 3% cost disadvantage in 2020 for Southern Nevada relative to the national trend cost reduces by 5% the number of new residents projected to be added to the region's 2020 normal base population illustrated above.

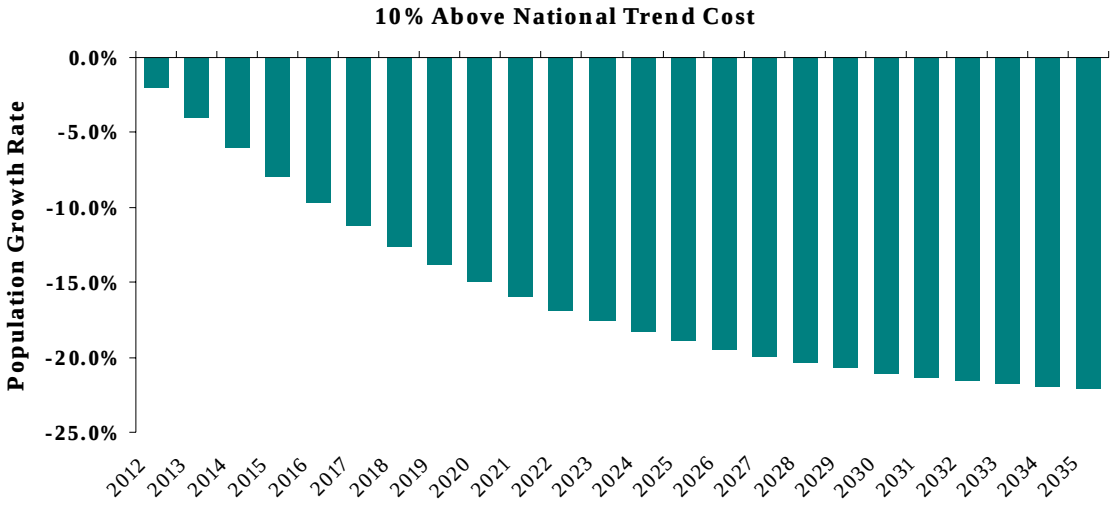
Southern Nevada Warehousing and Transportation Cost Impact on Population Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035



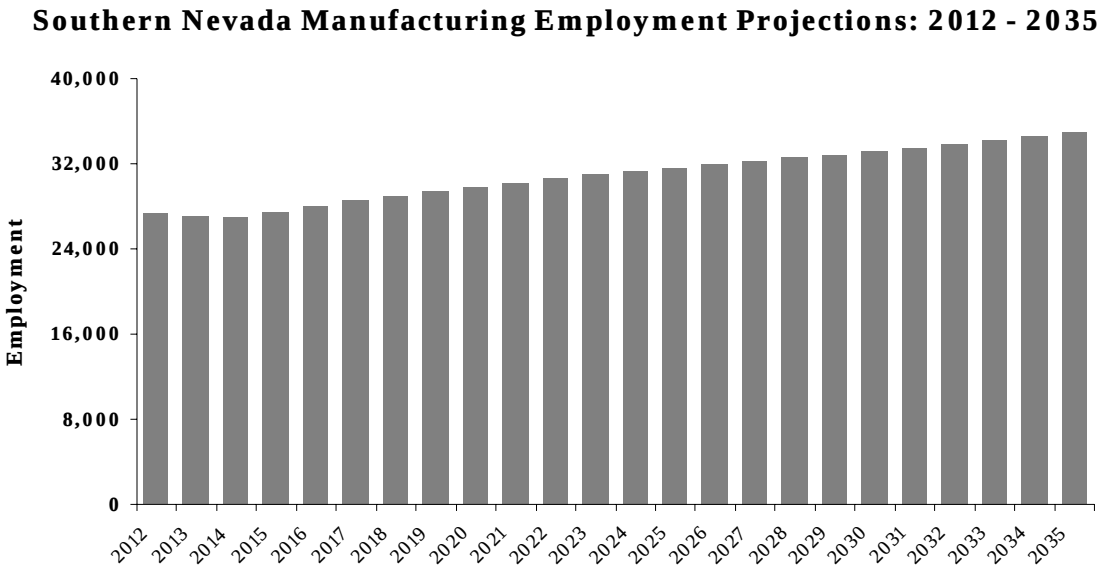


Southern Nevada Warehousing and Transportation Cost Impact on Population Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035 (continued)



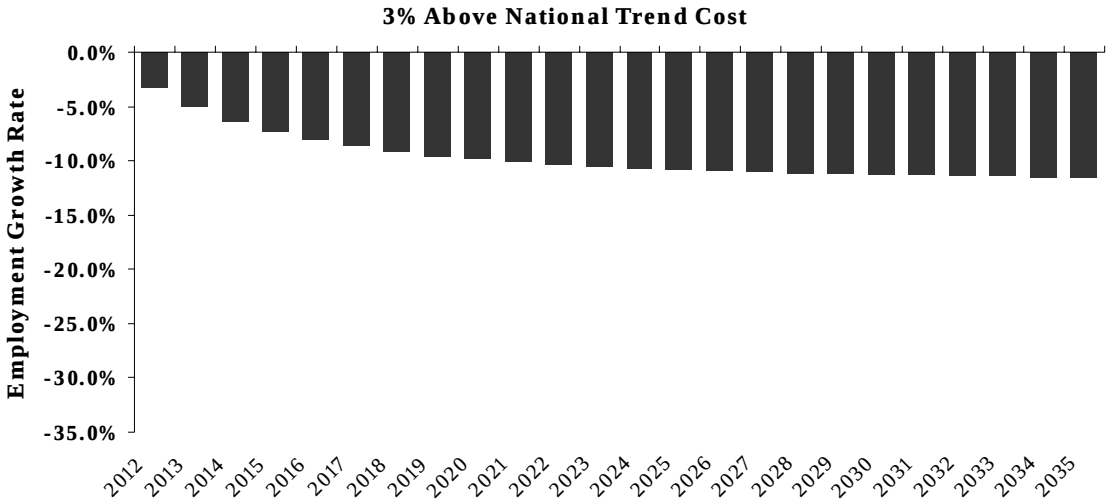


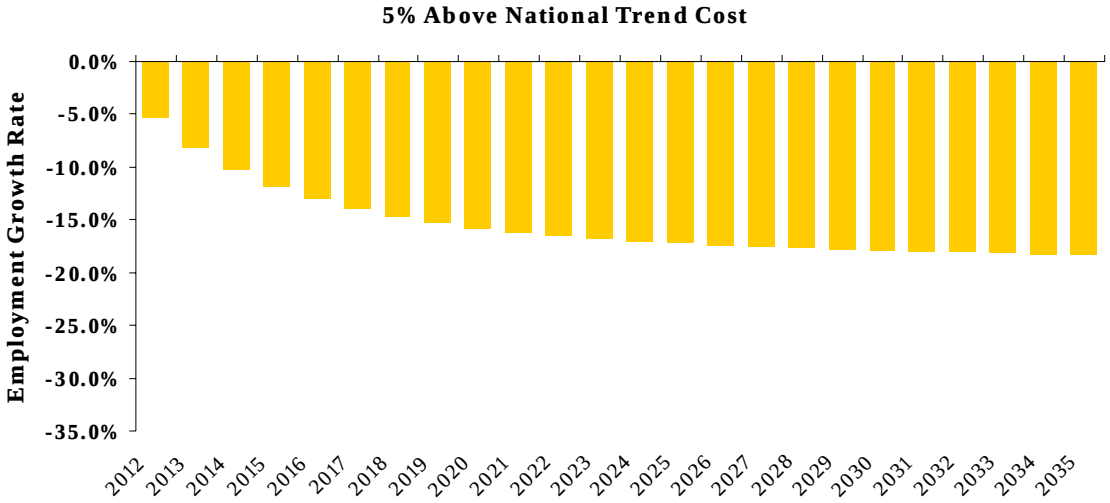
Normal Base Manufacturing Employment



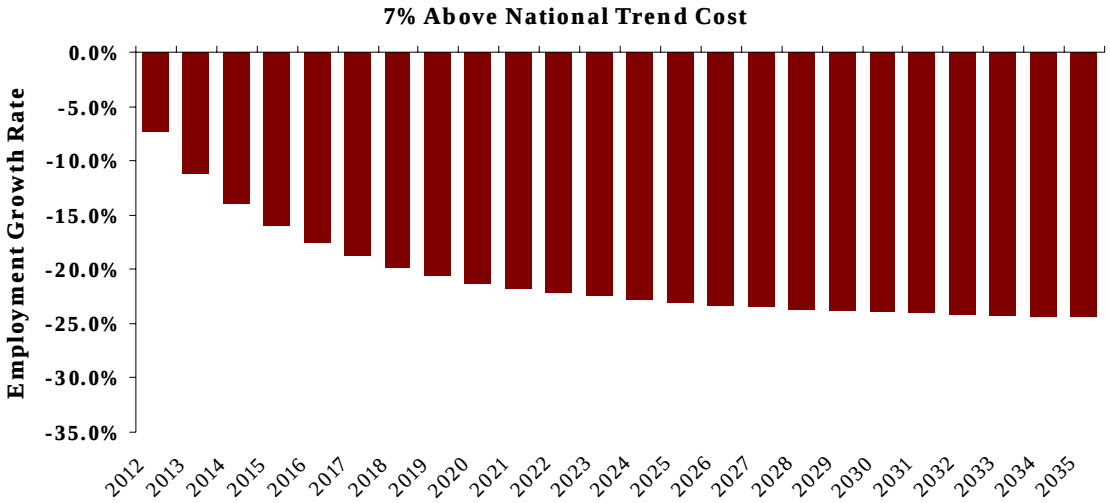
The following four graphs present the impacts (negative) on annual manufacturing job growth, resulting from various cost disadvantage scenarios above the national trend cost, compared to the normal base figures shown above. For example, a 3% cost disadvantage in 2013 for Southern Nevada relative to the national trend cost reduces by 5% the number of jobs expected to be added to the region's 2013 normal base of manufacturing employment illustrated above.

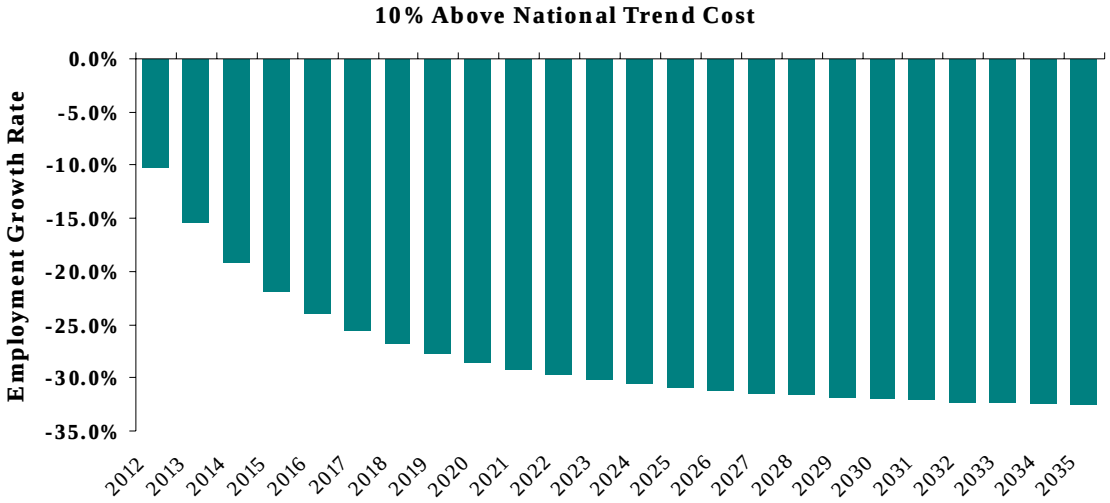
Southern Nevada Warehousing and Transportation Cost Impact on Manufacturing Employment Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035





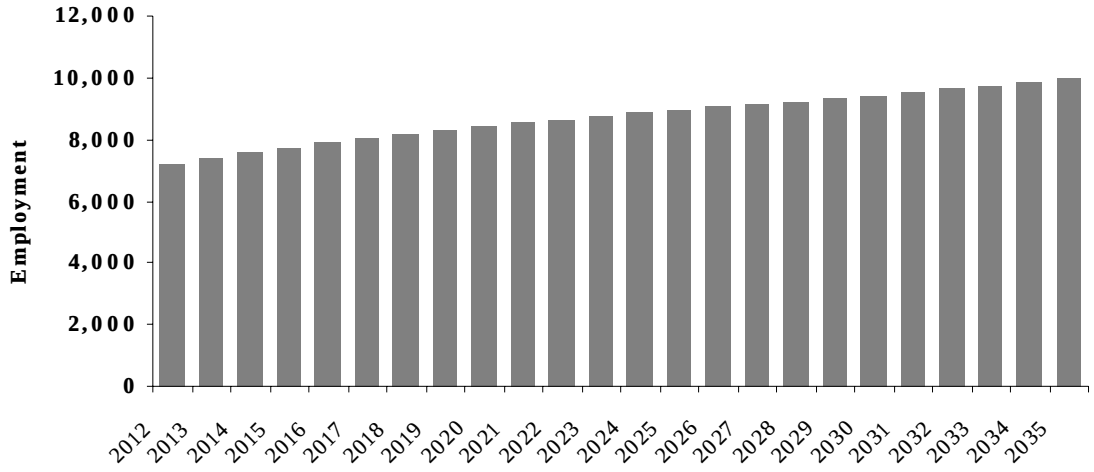
Southern Nevada Warehousing and Transportation Cost Impact on Manufacturing Employment Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035 (continued)





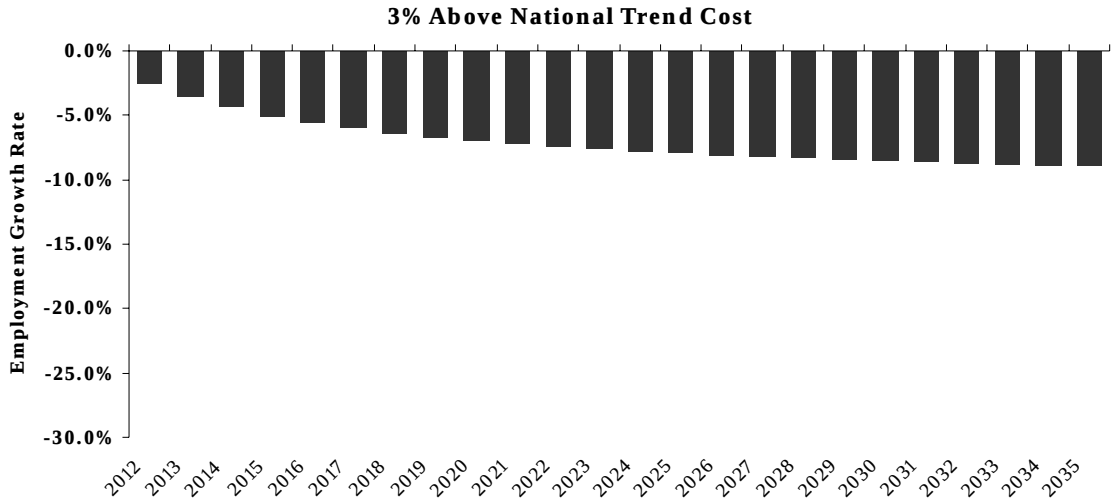
Normal Base Scientific Professional Employment

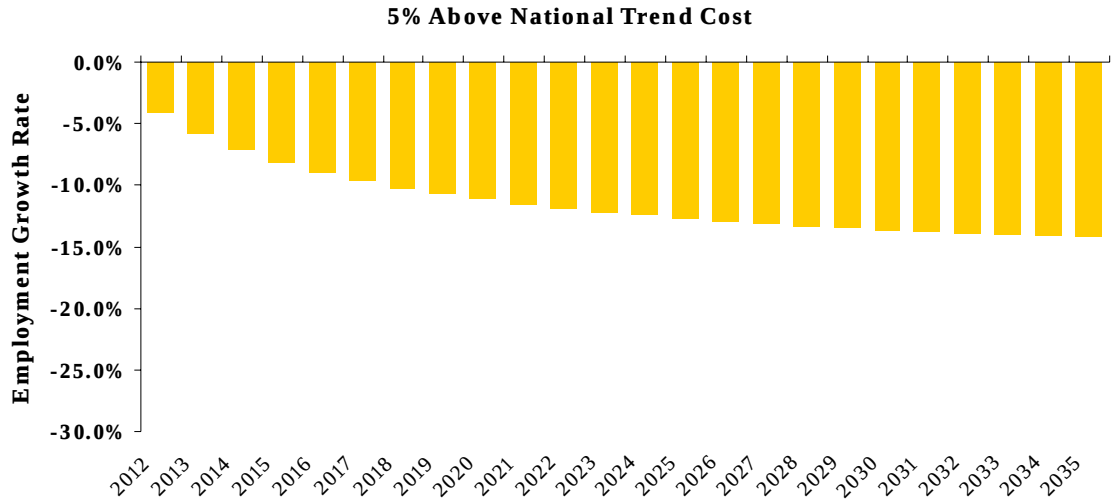
Southern Nevada Scientific Professional Employment Projections: 2012 - 2035



The following four graphs present the impacts (negative) on annual scientific professional job growth, resulting from various cost disadvantage scenarios above the national trend cost, compared to the normal base figures shown above. For example, a 3% cost disadvantage in 2015 for Southern Nevada relative to the national trend cost reduces by 5% the number of jobs expected to be added to the region's 2015 normal base of scientific professional employment illustrated above.

Southern Nevada Warehousing and Transportation Cost Impact on Scientific Professional Employment Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035





Southern Nevada Warehousing and Transportation Cost Impact on Scientific Professional Employment Growth - 3% 5%, 7% and 10% Above National Trend Cost: 2012 – 2035 (continued)