



Capital Improvements Advisory Committee

Meeting Date: January 6, 2015

Subject: To Review Regional Road Impact Fee Land Use Assumptions and Capital Improvement Plan

Applicant: Engineering and Capital Projects Division

Agenda Item Number: 7.A.

Summary: Review and affirm the Regional Road Impact Fee land use assumptions; and, review the Regional Road Impact Fee Capital Improvement Plan and provide comments to the Washoe County Board of County Commissioners

Recommendation: **Affirm that the Regional Road Impact Fee land use assumptions are in conformance with the Washoe County Master Plan, review the Regional Road Impact Fee Capital Improvements Plan and direct staff to provide comments of the Committee regarding that Plan to the Washoe County Board of County Commissioners**

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Description

The Planning Commission will convene as the Capital Improvements Advisory Committee (CIAC) to review the Regional Road Impact Fee Land Use Assumptions and to affirm that those assumptions are in conformance with the Washoe County Master Plan. The CIAC will also review the Regional Road Impact Fee Capital Improvements Plan and provide comments on that Plan to the Washoe County Board of County Commissioners.

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Public Notice

There are no requirements within NRS or Washoe County Code Chapter 110 (Development Code) for notice of CIAC meetings. Therefore, staff followed the provisions of notice for a Development Code Amendment, which includes publishing a legal notice in the newspaper and notification to every chairperson and member of each Citizen Advisory Board in Washoe County 10 days prior to the public hearing. Such notification was accomplished and staff can provide proof of notification if requested.

Background

Land Use Assumption Discussion

The Regional Road Impact Fee (RRIF) was created as a funding mechanism for regional roadway capacity improvement projects which are directly related to new development. Nevada Revised Statutes (NRS) 278B allows the imposition of such a fee. An impact fee is defined as a charge imposed by a local government on new development to finance the costs of a capital improvement or facility expansion necessitated by and attributable to the new development. The RRIF has been in effect since February of 1996.

The General Administrative Manual, (GAM) establishes guidelines and procedures on how the fee will be administered. The proposed GAM is the fifth edition of the manual. The Regional Road Capital Improvements Plan and Impact Fee Methodology (Regional CIP) provides a list of regional roadway improvements based on a 10 year forecast. The Regional CIP also describes the method used to establish the cost per service unit of new roadway capacity. In accordance with the provisions of the Regional Road Impact Fee Interlocal Cooperation Agreement, the Regional Transportation Commission (RTC) is to conduct transportation, independent fee studies, and reviews as necessary and report the results of those studies no less than every two years to the local jurisdictions and to the RTC Board. As some of the overview of the existing RRIF system is technical and time consuming, RTC contracted with the consulting firm of TischlerBise to revise the RRIF Program, to include the Regional CIP. The draft documents and final product of the Regional CIP and GAM were reviewed by the RRIF Technical Advisory committee (RRIF TAC) The RRIF TAC consists of the Planning Directors and Public Works Directors from the Cities of Reno, and Sparks and from Washoe County or their designated staff, a Planning Commission member from each local jurisdiction, two RTC staff and four private sector members. The first step in updating the RRIF was to update the land use

assumptions used to model projected regional roadway requirements. Those land use assumptions are included as Attachment A.

As defined in NRS 278B.060, “land use assumptions” means projections of changes in land use, densities, intensities and population for a specified service area, over a period of at least ten years, and in accordance with the master plan of the local government. NRS 278B.100 defines “service area” as any specified area within the boundaries of a local government in which new development necessitates capital improvements or facility expansions and within which new development is served directly and benefited by the capital improvement or facility expansion as set forth in the capital improvements plan. The 2012 Consensus Forecast, as approved by the Truckee Meadows Regional Governing Board, was used to develop the updated RRIF (see Attachment B). Washoe County Planning Staff worked with the Truckee Meadows Regional Planning Agency (TMRPA) to insure that the 2012 Consensus Forecast was in compliance with the County Master Plan. The RRIF TAC had no objection to using the consensus forecast. The TMRPA [in partnership with RTC, the Nevada Department of Transportation (NDOT), Washoe County, Reno and Sparks] created an allocation based model using the population and employment forecasts from the consensus forecast to project where future growth is likely to occur within the service areas. The model used development factors such as approved building permits, existing land use, master plan categories and regulatory zoning, topography, existing and planned infrastructure, and public services along with a collaboration discussion with local government staff to determine the geographical distribution of future growth. This information was used in the RTC regional travel demand model to identify new capacity projects for the region.

Regional Road Impact Fee Capital Improvements Plan Discussion

An impact fee service area (RRIF Service Area) functions as the basis for the calculation of the RRIF impact fee. All new development within a given service area pays impact fees which are used to provide regional road capacity improvements to accommodate new growth. Initially, the RRIF Program established a single regional service area divided into three separate benefit districts to account for impact fee collections and expenditures. Subsequent to the creation of the Washoe County RRIF Program, NRS 278B.100 was revised to “exclude an entire local government from falling within a single service area, unless the total population was less than 15,000”. In order to comply with NRS, numerous options for revised RRIF Service Areas were explored. Ultimately, two service areas were selected – a North Service Area comprised of the previous Northeast and Northwest Benefit Districts (see Attachment C) and a South Service Area equal to the South Benefit District (see Attachment D). As a result, separate fees will be calculated for each Service Area.

The RRIF Capital Improvement Plan (CIP) represents the new regional road projects, regional road widening projects, freeway ramp and intersection improvements, and revenue needed to provide capacity for new development within the impact fee service areas over the 2014-2024 timeframe. The RRIF CIP is the fifth edition of the program. A CIP for each Service Area was established based on the 2035 Regional Transportation Plan and augmented with additional analysis using the Regional Transportation Commission’s (RTC) Travel Demand Model. The RRIF share for each of the projects listed in each CIP was determined taking into account other revenue sources, such as RTC Bonding, and Federal and State highway funds.

To determine the total Vehicle Miles Traveled (VMT’s) per service area, the total new trips were multiplied by the average trip length for each service area. Trip lengths represent the average distance traveled on the regional road network only and exclude travel on freeways and residential roads. The new trip lengths used for the North and South Service Areas represent a 25 percent reduction from the trip length used in the 4th Edition RRIF Program.

The fee rates resulting from this process are presented in the RRIF Schedule in Attachment E. Fees are slightly higher in the South Service Area as compared to the North Service Area due to more planned roadway improvements in the South. Overall, the fees in most land use categories are a reduction from the current fees. This can be attributed to a reduced RRIF CIP and a lower average trip length.

The 4th Edition RRIF Schedule had two fees per land use, one fee for permits pulled in the City of Reno and a separate fee for permits pulled in Sparks or Washoe County. Fees within the City of Reno were initially discounted to account for outstanding road improvement bonds issued prior to the implementation of the RRIF Program. Those bonds have now been retired.

Action by the Planning Commission

NRS 278B.150 requires that a Capital Improvements Advisory Committee (CIAC) be established before any local jurisdiction can impose an impact fee. The NRS section further outlines the duties of the CIAC pertinent to reviewing the land use assumptions and capital improvements plan which are the basis of an impact fee.

NRS 278B.150 Capital improvements advisory committee: Establishment; designation of planning commission; duties.

1. Before imposing an impact fee, the governing body of the local government must establish by resolution a capital improvements advisory committee. The committee must be composed of at least five members.
2. The governing body may designate the planning commission to serve as the capital improvements advisory committee if:
 - (a) The planning commission includes at least one representative of the real estate, development or building industry who is not an officer or employee of the local government; or
 - (b) The governing body appoints a representative of the real estate, development or building industry who is not an officer or employee of the local government to serve as a voting member of the planning commission when the planning commission is meeting as the capital improvements advisory committee.
3. The capital improvements advisory committee shall:
 - (a) Review the land use assumptions and determine whether they are in conformance with the master plan of the local government;
 - (b) Review the capital improvements plan and file written comments;
 - (c) Every 3 years file reports concerning the progress of the local government in carrying out the capital improvements plan;
 - (d) Report to the governing body any perceived inequities in the implementation of the capital improvements plan or the imposition of an impact fee; and
 - (e) Advise the local government of the need to update or revise the land use assumptions, capital improvements plan and ordinance imposing an impact fee.

The Washoe County Board of County Commissioners appointed the Washoe County Planning Commission as the Washoe County CIAC on November 12, 2014. Pursuant to NRS 278B.150, the Washoe County CIAC must review land use assumptions and determine whether the assumptions are in conformance with the Washoe County Master Plan. The land use assumptions which form the basis for the changes in the RRIF are included as Attachment A and B.

There are no guidelines or regulations in NRS or the Development Code to guide a determination of conformance with the County's Master Plan, so staff suggests using pertinent findings from Washoe County Code Section 110.820.15(d) for the review of a Master Plan Amendment as the foundation for a finding of conformance. The pertinent findings, and associated staff comments, appear below.

1. Consistency with Master Plan. The land use assumptions are in substantial compliance with the policies and action programs of the Master Plan.

Staff comment: Land use assumptions are based on land uses and densities allowed in the Master Plan. The latest version of the Washoe County Master Plan was adapted by the Washoe County Planning Commission on May 20, 2010.

2. Response to Change Conditions. The land use assumptions respond to changed conditions or further studies that have occurred since the plan was adopted by the Board of County Commissioners and the assumptions represent a more desirable utilization of land.

Staff comment: Projected population and employment are based on the 2012 Consensus Forecast, which is the latest adopted Consensus Forecast and provides the changed conditions from the current RRIF.

3. Availability of Facilities. There are or are planned to be adequate transportation and other facilities to accommodate the uses and densities projected by the land use assumptions.

Staff comment: Planning Staff reviewed and commented on the draft 2012 Consensus Forecast, based not only on master plan categories within the County's Master Plan but also on adopted regulatory zoning. This allowed staff to comment on the potential transportation facilities required to support future growth within the limits of adopted master plan categories and regulatory zones.

4. Desired Pattern of Growth. The land use assumptions will promote the desired pattern for the orderly physical growth of the County and guide development of the County based on the projected population growth with the least amount of natural resource impairment and the efficient expenditure of funds for public services.

Staff comment: The 2012 consensus forecast is approved by the Truckee Meadows Regional Governing Board and includes the County's Master Plan categories and resulting adopted regulatory zones. RTC translates the consensus forecast into geographic centric areas for projection of growth and resulting demands for future transportation improvements. The RTC geographic areas used in developing the RRIF, therefore, mirror the desired growth pattern as established in the Washoe County Master Plan.

Pursuant to NRS 278B.150, the Washoe County CIAC must review the RRIF CIP and provide written comments on the CIP to the Washoe County Board of County Commissioners. Staff suggests the following possible comments be considered as the CIAC's comments to the Board of County Commissioners. The CIAC should modify or drop these comments as appropriate, or add additional comments as needed.

1. *The Regional Capital Improvement Plan is based on the County Master Plan and the 2012 Consensus Forecast.*
2. *The Regional Capital Improvement Plan facilitates growth by constructing capacity improvements to the region's streets and highways that will benefit the efficient movement of persons and goods.*
3. *The North Service Area and South Service Area with separate Capital Improvements and Impact Fees are contributing to creating a reasonable nexus which is federal law.*
4. *The Regional Capital Improvement Plan will not adversely impact the public health, safety, or welfare.*

5. *The Regional Capital Improvement Plan is based upon due and careful consideration of the information provided in the "2014 Regional Road Capital Improvements Plan and Impact Fee Methodology"*

Recommendation

It is recommended that the Washoe County Capital Improvement Advisory Committee (CIAC) review the Regional Road Impact Fee Land Use Assumptions and affirm that those assumptions are in conformance with the Washoe County Master Plan. It is also recommended that the CIAC direct staff to provide its review and affirmation of Master Plan conformance to the Washoe County Board of County Commissioners.

It is further recommended that the CIAC review the Regional Road Impact Fee Capital Improvement Plan and direct staff to provide comments from the Committee in writing to the Washoe County Board of County Commissioners and that the CIAC direct the Committee Chair (the Planning Commission Chair) to review the written comments when prepared by staff and sign the comments on behalf of the Committee.

Motion

I move that after giving reasoned consideration to the information contained in the staff report and to information received during the meeting, the Washoe County Capital Improvements Advisory Committee affirm that the Regional Road Impact Fee Land Use Assumption are in conformance with the Washoe County Master Plan. I also move to direct staff to provide this Committee's affirmation of Master Plan conformance to the Washoe County Board of County Commissioners.

I further move that the Washoe County Capital Improvements Advisory Committee provide the following comments on the Regional Road Impact Free Capital Improvement Plan in writing to the Washoe County Board of County Commissioners, and that the Committee Chair review the written comments when prepared by staff and sign the comments on behalf of the Committee.

Staff Report xc:

Julie Masterpool, PE, RTC Senior Engineer
Dwayne E. Smith, PE, Director of Engineering & Capital Projects

APPENDIX A: LAND USE ASSUMPTIONS

As defined in NRS 278B.060, “land use assumptions” means projections of changes in land use, densities, intensities and population for a specified service area, over a period of at least ten years, and in accordance with the master plan of the local government. In NRS 278B.100 “service area” is defined as any specified area within the boundaries of a local government in which new development necessitates capital improvements or facility expansions and within which new development is served directly and benefited by the capital improvement or facility expansion as set forth in the capital improvements plan.

Key Growth Indicators

Population and job projections from the 2012 Consensus Forecast were used to derive the Regional Road Impact Fees (RRIF) for the north and south service areas. TischlerBise obtained 2010 and 2025 population and job data, with interim years derived using a compound growth equation. Dividing annual population projections by the average number of persons per housing unit yields projected housing units by service area.

Persons per Housing Unit

The 2010 census did not obtain detailed information using a “long-form” questionnaire. Instead, the U.S. Census Bureau has switched to a continuous monthly mailing of surveys, known as the American Community Survey (ACS), which is limited by sample-size constraints. For example, data on detached housing units are now combined with attached single units (commonly known as townhouses).

TischlerBise recommends that impact fees be imposed for two residential categories. According to the U.S. Census Bureau, a household is a housing unit that is occupied by year-round residents. Development fees often use per capita standards and persons per housing unit, or persons per household, to derive proportionate-share fee amounts. TischlerBise recommends that fees for residential development be imposed according to the number of year-round residents per housing unit. As shown Figure A1, the U.S. Census Bureau estimates Washoe County had 185,289 housing units in 2012. Dwellings with a single unit per structure (detached, attached, and mobile homes) averaged 2.49 persons per housing unit. Even though townhouses are attached, each unit is on an individual parcel and is considered to be a single unit. Dwellings in structures with multiple units averaged 1.77 year-round residents per unit. This category includes duplexes, which have two dwellings on a single land parcel. The overall average is 2.28 year-round residents per housing unit.

Figure A1 – Persons per Unit by Type of Housing in Washoe County

<i>Units in Structure</i>	<i>Renter & Owner</i>			<i>Housing Units</i>	<i>Persons per Housing Unit</i>	<i>Housing Mix</i>
	<i>Persons</i>	<i>Households</i>	<i>Persons per Household</i>			
Single Unit*	331,138	120,491	2.75	133,117	2.49	72%
2+ Units	92,154	43,411	2.12	52,172	1.77	28%
Subtotal	423,292	163,902	2.58	185,289	2.28	<i>Vacancy Rate</i>
Group Quarters	6,616					<i>Rate</i>
TOTAL	429,908	163,902		185,289		12%

* Single family includes detached, attached, and mobile homes.

Source: Tables B25024, B25032, B25033, and B26001.

2012 1-Year Estimates, American Community Survey, U.S. Census Bureau.

Customized Trip Generation Rates per Housing Unit

As an alternative to simply using the national average trip generation rate for residential development, the Institute of Transportation Engineers (ITE) publishes regression curve formulas that may be used to derive custom trip generation rates, using local demographic data. Key independent variables needed for the analysis (i.e. vehicles available, housing units, households and persons) are available from American Community Survey data for Washoe County. Customized average weekday trip generation rates by type of housing are shown in Figure A2. A vehicle trip end represents a vehicle either entering or exiting a development, as if a traffic counter were placed across a driveway. The custom trip generation rates for Washoe County are lower than national averages. For example, single-unit residential development in Washoe County is expected to produce 8.27 average weekday vehicle trip ends per dwelling, which is lower than the national average of 9.57 (see ITE code 210). For apartments (ITE 220) the national average is 6.65 trips ends per dwelling on an average weekday. The recommended custom rate of 5.37 for Washoe County is lower than the national average.

Figure A2 - Residential Trip Generation Rates by Type of Housing

Washoe County, Nevada		Households (2)			Vehicles per Household by Tenure
	Vehicles Available (1)	Single Unit per Structure	2+ Units per Structure	Total	
Owner-occupied	198,288	90,066	3,167	93,233	2.13
Renter-occupied	95,390	30,425	40,244	70,669	1.35
TOTAL	293,678	120,491	43,411	163,902	1.79
Housing Units (6) =>		133,117	52,172	185,289	

Units per Structure	Persons (3)	Trip Ends (4)	Vehicles by Type of Housing	Trip Ends (5)	Average Trip Ends	Trip Ends per Housing Unit
Single Units	331,138	856,992	232,621	1,344,672	1,100,832	8.27
2+ Units	92,154	319,710	61,057	240,860	280,285	5.37
TOTAL	423,292	1,176,702	293,678	1,585,532	1,381,117	7.45

Floor Area of Nonresidential Development

In Figure A3, gray shading indicates three nonresidential development prototypes used by TischlerBise to convert job projections into nonresidential floor area estimates. Average weekday vehicle trip generation rates are from the Institute of Transportation Engineers (ITE 2012). The prototype for industrial jobs is “Warehousing”. The prototype for commercial development, including retail and eating/drinking places, is an average-size shopping center. The prototype for all other service jobs is an average-size general office building.

Figure A3 – Employee and Building Area Ratios

<i>ITE Code</i>	<i>Land Use / Size</i>	<i>Demand Unit</i>	<i>Wkdy Trip Ends Per Dmd Unit*</i>	<i>Wkdy Trip Ends Per Employee*</i>	<i>Emp Per Dmd Unit</i>	<i>Sq Ft Per Emp</i>
110	Light Industrial	1,000 Sq Ft	6.97	3.02	2.31	433
130	Industrial Park	1,000 Sq Ft	6.83	3.34	2.04	489
140	Manufacturing	1,000 Sq Ft	3.82	2.13	1.79	558
150	Warehousing	1,000 Sq Ft	3.56	3.89	0.92	1,093
254	Assisted Living	bed	2.66	3.93	0.68	na
320	Motel	room	5.63	12.81	0.44	na
520	Elementary School	1,000 Sq Ft	15.43	15.71	0.98	1,018
530	High School	1,000 Sq Ft	12.89	19.74	0.65	1,531
540	Community College	student	1.23	15.55	0.08	na
550	University/College	student	1.71	8.96	0.19	na
565	Day Care	student	4.38	26.73	0.16	na
610	Hospital	1,000 Sq Ft	13.22	4.50	2.94	340
620	Nursing Home	1,000 Sq Ft	7.60	3.26	2.33	429
710	General Office (avg size)	1,000 Sq Ft	11.03	3.32	3.32	301
760	Research & Dev Center	1,000 Sq Ft	8.11	2.77	2.93	342
770	Business Park	1,000 Sq Ft	12.44	4.04	3.08	325
820	Shopping Center (avg size)	1,000 Sq Ft	42.70	na	2.00	500

* Trip Generation, Institute of Transportation Engineers, 9th Edition (2012).

Washoe County Consensus Forecast 2012 - 2032



May 2012

Acknowledgments

Washoe County Board of County Commissioners

David Humke, District 2

Bonnie Weber, Vice Chair, District 5

John Breternitz, District 1

Kitty Jung, District 3

Robert Larkin, Chair, District 4

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Washoe County

City of Reno

City of Sparks

Truckee Meadows Water Authority

Truckee Meadows Regional Planning Agency

Washoe County School District

Regional Transportation Commission of Washoe County

Northern Nevada Water Planning Commission

Western Regional Water Commission

Thanks To

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Jim Smitherman, Northern Nevada Water Planning Commission

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Introduction

The Consensus Forecast for Washoe County uses a number of leading forecasts, which has several advantages over using a single source for forecasting population. Not only does the consensus approach minimize the risk of large forecast errors, but consensus forecasts consistently outperform individual forecasts across a range of variables. The consensus approach is discussed in further detail in the article titled “Consensus Forecasts in Planning,” found in Appendix A.

Four reputable sources of long-term forecasts for Washoe County were used: Global Insight, a national forecasting firm in Massachusetts that prepares national, state and county forecasts; Woods and Poole, a national forecasting firm in Washington, DC, that forecasts for every county in the United States, as well as state and national forecasts; Truckee Meadows Water Authority’s *Population and Employment Econometric Model*; and the 2011 Nevada State Demographer’s Forecast.

The *Washoe County Consensus Forecast 2012-2032*, uses these sources and outlines the projected population, employment and income for Washoe County through the year 2032. The forecasts in this document are for all of Washoe County (Reno MSA) including both the cities of Reno and Sparks and the unincorporated areas of Washoe County, including Incline Village. A summary of the consensus forecast for Washoe County is shown in Table 1.

Table 1

Washoe County Consensus Forecast Summary

Year	Total Population	Total Employment	Total Personal Income \$ ('000)	Per Capita Income
2012	425,930	273,042	\$17,421,365	\$47,467
2017	458,322	295,122	\$21,160,211	\$57,366
2022	490,591	314,868	\$25,969,219	\$69,625
2027	524,657	337,369	\$31,575,402	\$84,353
2032	560,772	361,065	\$38,429,313	\$103,178

The population forecasts prepared by Global Insight, Truckee Meadows Water Authority, Woods and Poole, and the 2011 Nevada State Demographer's Forecast were compared for consistency and then averaged to arrive at a consensus number. When comparable numbers were not available from each of the four sources, only the numbers that were comparable were averaged. When less than four sources were used, it is noted in the text. Only Woods and Poole and Global Insight provided data for Total Establishment-Based Employment, Total Personal Income, and Per Capita Income.

Table 2

**The 2011 Nevada State Demographer's Forecast of Washoe County Population
(2010 – 2032)**

Year	Population
2010	417,379
2011	409,680
2012	419,590
2013	428,741
2014	437,132
2015	445,260
2016	453,126
2017	459,570
2018	464,440
2019	468,756
2020	473,616
2021	478,459
2022	482,755
2023	486,846
2024	490,825
2025	494,788

2026	498,846
2027	503,303
2028	507,964
2029	512,895
2030	517,889
2031*	523,350
2032*	528,811

Source: Washoe County and Nevada State Demographer.

**Note: The Nevada State Demographer's Forecast is only projected to the year 2030. Therefore, to match the forecast horizon of the other sources, the last two years of the forecast depicted above were extrapolated. The number of new persons added for each year from 2011 to 2030 was averaged (5,461) and applied to this existing forecast in order to extend the population figures to 2031 and 2032.*

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Population

Total population in Washoe County is projected to grow from 425,930 in 2012 to 560,772 in 2032. This represents an average annual growth rate of 1.38 percent. The highest forecasted population for 2032 was 588,950 from Woods and Poole , and the lowest forecasted population was 528,811 from the Nevada State Demographer. The 2012 and 2032 forecasted population by each source is shown in Table 3. The consensus population forecast for each year is shown in Table 4.

Table 3

Population by Forecast Source

Forecast Source	2012 Forecast Population	2032 Population
Global Insight	422,370	582,240
Truckee Meadows Water Authority (TMWA)	424,787	543,086*
Woods and Poole	436,971	588,950
2011 State Demographer's Forecast	419,590	528,811*
Consensus Forecast (Four Sources)	425,930	560,722

Source: Washoe County, Global Insight, Woods and Poole, 2011 State Demographer's Forecast, and TMWA.

**Note: The Nevada State Demographer and the Truckee Meadows Water Authority Forecasts are only projected to the year 2030. Therefore, to match the forecast horizon of the other sources, the last two years of these forecasts were extrapolated. The number of new persons added for each year from 2012 to 2030 were averaged and applied to the existing forecasts in order to extend the population figures to 2032.*

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Table 4**Washoe County Population (Draft Consensus Forecast), 2012 – 2032**

Year	Population
2012	425,930
2013	432,432
2014	438,722
2015	445,185
2016	451,801
2017	458,322
2018	464,503
2019	470,772
2020	477,238
2021	483,973
2022	490,591
2023	497,433
2024	504,162
2025	510,976
2026	517,697
2027	524,657
2028	531,645
2029	538,670
2030	545,707
2031*	553,227
2032*	560,772

Source: Washoe County, Global Insight, Woods and Poole, TMWA, and 2011 State Demographer's Forecast.

**Note: The Nevada State Demographer and the Truckee Meadows Water Authority Forecasts are only projected to the year 2030. Therefore, to match the forecast horizon of the other sources, the last two years of these forecasts were extrapolated. The number of new persons added for each year from 2012 to 2030 were averaged and applied to the existing forecasts in order to extend the population figures to 2032.*

The age distribution of the population is expected to shift over the next two decades, primarily in the working and retired age groups. Changes of note include the continued aging of the baby boomer population, a decrease in the working group (ages 20-64) and a marked increase in the retired group (ages 65 and older). The preschool (ages under 5) and school (ages 5-19) groups will remain relatively flat with only slight growth (.2%) as a percentage of the population. Population by cohort data is available from Global Insight and Woods and Poole, however, this data is not available from TMWA or the 2011 State Demographer's Forecast. Population by 5-year Age Cohort for 2012 - 2032 is shown in Table 6 on page 6.

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Table 5**Population and Percent Composition of Total Population by Generalized Age Groups**

Generalized Age Group	2012		2032	
	Population	Percent of Total	Population	Percent of Total
Preschool (Ages 0-4)	30,302	7.1%	42,683	7.3%
School (Ages 5-19)	86,294	20.1%	118,842	20.3%
Working (Ages 20-64)	258,978	60.3%	325,639	55.6%
Retired (Ages 65 and older)	54,102	12.6%	98,427	16.8%
Totals*	429,676	100%	585,591	100%

Source: Washoe County, Global Insight, and Woods and Poole.

Note: *Population by cohort is not available from Truckee Meadows Water Authority or the 2011 State Demographer's Forecast

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Table 6
 Consensus Population Forecast by 5-year Age Cohort, 2012 – 2032

Age	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
0-4	30,302	30,708	31,096	31,553	32,046	32,576	33,128	33,721	34,332	34,989
5-9	29,182	29,474	29,875	30,064	30,362	30,756	31,189	31,684	32,228	32,816
10-14	28,013	28,556	28,888	29,353	29,793	30,215	30,621	31,206	31,539	31,999
15-19	29,099	29,148	29,399	29,798	30,187	30,664	31,370	31,812	32,383	32,937
20-24	30,413	30,734	30,900	31,162	31,596	31,980	32,221	32,763	33,411	34,063
25-29	28,888	28,879	29,226	29,558	29,873	30,353	30,702	30,902	31,194	31,691
30-34	28,855	29,261	29,319	29,388	29,029	29,180	29,331	29,843	30,289	30,688
35-39	27,286	27,689	28,295	28,920	30,123	30,498	31,046	31,300	31,553	31,394
40-44	28,238	27,989	27,513	27,156	26,848	27,129	27,636	28,378	29,112	30,433
45-49	31,987	31,683	31,494	31,600	31,818	32,049	32,120	31,999	31,977	32,036
50-54	31,900	31,999	32,203	32,143	31,996	31,865	31,785	31,864	32,183	32,594
55-59	27,116	27,540	27,757	27,986	28,231	28,413	28,548	28,819	28,823	28,735
60-64	24,297	24,509	24,875	25,268	25,674	26,185	26,627	26,904	27,173	27,460
65-69	18,972	19,754	20,432	21,197	21,816	21,934	22,195	22,629	23,060	23,473
70-74	13,219	13,863	14,486	15,074	15,691	16,549	17,257	17,900	18,599	19,201
75-79	9,349	9,761	10,180	10,621	11,089	11,656	12,246	12,813	13,354	13,925
80-84	6,591	6,738	6,951	7,171	7,434	7,813	8,192	8,571	8,955	9,368
85+	5,973	6,183	6,405	6,667	6,940	7,218	7,504	7,815	8,178	8,566
Total	429,676	434,465	439,290	444,674	450,541	457,027	463,714	470,917	478,339	486,363

Attachment B -2012 Consensus Forecast

Age	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
0-4	35,684	36,414	37,131	37,866	38,582	39,301	39,981	40,649	41,322	41,990	42,683
5-9	33,408	34,050	34,690	35,368	36,039	36,759	37,442	38,120	38,796	39,470	40,116
10-14	32,517	33,114	33,725	34,388	35,053	35,754	36,404	37,065	37,740	38,421	39,115
15-19	33,448	33,973	34,668	35,099	35,622	36,238	36,850	37,488	38,185	38,899	39,612
20-24	34,757	35,696	36,266	37,003	37,665	38,304	38,883	39,666	40,116	40,690	41,320
25-29	32,119	32,410	32,944	33,559	34,091	34,586	35,500	35,980	36,629	37,200	37,729
30-34	31,204	31,580	31,777	32,046	32,471	32,827	33,169	33,791	34,501	35,155	35,776
35-39	31,720	32,067	32,727	33,307	33,775	34,371	34,909	35,284	35,750	36,377	36,942
40-44	30,885	31,546	31,870	32,204	32,083	32,439	32,899	33,667	34,330	34,897	35,595
45-49	32,663	33,572	34,689	35,813	37,497	38,380	39,235	39,785	40,351	40,457	41,066
50-54	32,955	33,186	33,168	33,279	33,415	34,171	34,926	35,911	36,860	38,384	39,008
55-59	28,620	28,558	28,610	28,878	29,171	29,415	29,429	29,194	29,066	28,973	29,399
60-64	27,675	27,870	28,174	28,227	28,165	28,113	28,035	28,102	28,352	28,620	28,806
65-69	23,963	24,400	24,658	24,908	25,152	25,338	25,485	25,756	25,771	25,688	25,604
70-74	19,358	19,672	20,119	20,565	20,968	21,455	21,884	22,146	22,402	22,649	22,841
75-79	14,737	15,421	16,061	16,758	17,333	17,537	17,889	18,347	18,813	19,237	19,710
80-84	9,847	10,371	10,870	11,355	11,844	12,533	13,131	13,701	14,317	14,831	15,047
85+	8,979	9,434	9,909	10,409	10,933	11,529	12,220	12,882	13,539	14,255	15,226
Total	494,534	503,329	512,050	521,028	529,853	539,047	548,268	557,530	566,836	576,189	585,590

Source: Washoe County, Global Insight and Woods and Poole.

Note: Population by cohort is not available from Truckee Meadows Water Authority or the 2011 State Demographer's Forecast, therefore the total population number is higher than the Washoe County Consensus Forecast figures.

Employment

According to the Woods and Poole and Global Insight forecasts, total employment for all of Washoe County is projected to grow from 273,042 in 2012 to 361,065 in 2032. This represents an average annual growth rate of 1.41 percent.

The 2012 and 2032 forecasted employment and percent of total employment by industry group is shown below in Table 7. To allow for consistency within employment sectors, only employment data from the Woods and Poole forecast is used in this table as the methodologies of Woods and Poole and Global Insight use different employment assumptions to generate industry sectors data.

Table 7

Employment and Percent Composition of Total

Total Employment by Industry Group

Employment by Industry Group	2012		2032	
	Jobs	Percent of Total	Jobs	Percent of Total
Natural Resources	2,482	.9%	2,469	.69%
Construction	12,244	4.43%	16,450	4.59%
Manufacturing	13,137	4.75%	14,834	4.14%
Transportation, Communication and Public Utilities	18,674	6.75%	24,097	6.72%
Wholesale Trade	11,487	4.15%	13,944	3.89%
Retail Trade	28,889	10.44%	37,428	10.44%
Finance, Insurance, & Real Estate	32,041	11.58%	39,432	11%
Services	123,636	44.7%	163,210	45.53%
Government	33,995	12.29%	46,585	13%
Totals	276,585	100%	358,449	100%

Source: Washoe County and Woods and Poole.

Note: The employment data include wage and salary workers, proprietors, private household employees, and miscellaneous workers of full and part-time jobs. Because part-time workers are included, a person holding two part-time jobs would be counted twice. Jobs are counted by place of work and not place of residence of the worker. Therefore, a job in the Reno Metropolitan Area is counted in Washoe County, regardless of where the worker resides. Due to rounding, the "Percent of Total" may not add up to 100%.

Industry sectors remain remarkably stable from 2012 to 2032 with less than 1% change projected for all sectors. The greatest amount of projected change is in the Services sector at .83% growth followed by Government at .71% growth (as a percentage of total employment). The largest declines are in the Manufacturing and the Finance, Insurance, and Real Estate sectors with declines of .61% and .58% respectively. The Services sector represents by far the largest percentage of total employment in 2032 at 45.53%, followed distantly by the Finance, Insurance and Real Estate (11%), Retail Trade (10.44%), and Government (13%) industry sectors. The largest numeric increase is in the Services sector where 39,574 jobs are added.

The industries that represent the smallest percentage of total employment in 2032 are Natural Resources (.69%), Wholesale Trade (3.89%), Manufacturing (4.14%), and Construction (4.59%). The smallest numeric change is seen in the Natural Resources category (comprised of Mining, Forestry, Other, and Farm Based employment sectors) with a forecasted decrease of 13 jobs.

The consensus total employment forecast by year is provided on the next page.

Table 8**Washoe County Consensus Total Employment 2012 – 2032**

Year	Employment
2012	273,042
2013	275,229
2014	279,173
2015	284,542
2016	290,142
2017	295,122
2018	299,353
2019	303,210
2020	307,469
2021	311,251
2022	314,868
2023	318,704
2024	322,933
2025	327,393
2026	332,239
2027	337,369
2028	342,467
2029	347,527
2030	352,153
2031	356,510
2032	361,065

Source: Washoe County, Woods and Poole and Global Insight.

Note: Total employment is based on Global Insight and Woods and Poole forecasts. The Truckee Meadows Water Authority forecast and 2011 State Demographer's Forecast do not provide data regarding employment.

The methodologies for the employment forecasts for Global Insight and Woods and Poole are located in Appendices B and C.

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Income

Total personal income is expected to grow from \$17,849,009 in 2012 to \$36,932,760 in 2032. This represents the total personal income received by persons from wages and salaries, other labor income, and transfer payments less personal contributions for social insurance as adjusted for place of residence. All personal income data are presented in 2005 dollars. This is used to measure the “real” change in earnings and income when inflation is taken into account. The consensus forecast for total personal income for each year is shown in Table 9.

Table 9

Washoe County Total Personal Income, 2012 –2032

Year	Total Personal Income \$ (millions)
2012	17,849,009
2013	18,284,145
2014	18,910,525
2015	19,635,397
2016	20,426,013
2017	21,206,424
2018	21,988,065
2019	22,790,327
2020	23,633,958
2021	24,500,493
2022	25,378,380
2023	26,313,3441
2024	27,294,193
2025	28,323,516
2026	29,398,392

2027	30,562,618
2028	31,753,846
2029	32,998,363
2030	34,238,399
2031	35,552,183
2032	36,932,760

Source: Washoe County, Global Insight and Woods and Poole.

Note: Total personal income is based on Global Insight and Woods and Poole forecasts. The Truckee Meadows Water Authority forecast and the 2011 State Demographer's Forecast do not provide data regarding income.

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The consensus forecast for per capita personal income for each year is listed below:

Table 10

Washoe County Per Capita Personal Income, 2012 –2032

Year	Per Capita Personal Income
2012	45,383
2013	46,705
2014	48,429
2015	50,259
2016	52,226
2017	54,194
2018	56,134
2019	58,187
2020	60,278
2021	62,370
2022	64,577
2023	66,949
2024	69,376
2025	71,973
2026	74,684
2027	77,607
2028	80,733
2029	83,980
2030	87,304
2031	90,855

2032	94,631
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Source: Washoe County, Global Insight and Woods and Poole.

Note: Total per capita personal income is based on Global Insight and Woods and Poole forecasts. The Truckee Meadows Water Authority forecast and the 2011 State Demographer's Forecast do not provide data regarding income.

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Jurisdictional Splits

Reno, Sparks and Washoe County use the Governor's certified population estimates of 2011 as a starting point for determining jurisdictional forecast splits for the year 2032.

Table 11

2011 Governor's Certified Population Estimates*

Washoe County Total 2011	421,593
Reno City Total 2011	222,801
Sparks City Total 2011	92,302
Unincorporated Washoe County Total 2011	106,490

**Note: Cooperatively, Washoe County and the Nevada State Demographer prepare annual population estimates for Washoe County for July 1 of each year.*

In 2011, each jurisdiction contained the following percent of total population:

Table 12

2011 Jurisdictional Percent of Total Population

Reno Percent of Total	52.8%
Sparks Percent of Total	21.9%
Unincorporated Washoe County Percent of Total	25.3%

An analysis of historic census and estimated population figures since 1980 shows these jurisdictional percentages have remained relatively stable over time, with little apparent impact attributable to previous regional plans (prior to the 2007 Truckee Meadows Regional Plan Update) or conforming jurisdiction master plans.

In this 2012 Consensus Forecast, there was a desire to reflect a potential impact of the 2007 Truckee Meadows Regional Plan, as amended, on jurisdictional shares of population through the year 2032. The influence of plan policies on growth and development patterns, and the possible impacts on future settlement patterns are the subject of significant debate and reflect a different approach to forecasting in a multi-jurisdictional environment than forecasts based on a mere reflection and continuation of historic trends. While all forecasts reflect inherent uncertainties, especially in regions with highly variable decadal growth rates, forecasts associated with regional plan policies

can provide a useful guide, over time, as to the effectiveness and need for amendment of such growth policies.

The year 2032 Washoe County Consensus Forecast of 560,772 persons exceeds the 2011 Governor's certified estimate of 421,593 by a growth increment of 139,179 persons.

Reno, Sparks and Washoe County have decided to allocate the growth increment of 139,179 persons in the following manner:

Table 13

Growth Increment Allocation

25% of Growth Increment (34,795 persons) at Year 2032	Allocate to Centers, TOD Corridors, Emerging Employment Centers in Reno and Sparks
75% of Growth Increment (104,384 persons) at Year 2032	Allocate based on adjusted jurisdictional shares of population of 50% City of Reno, 24% City of Sparks and 26% Unincorporated Washoe County.

The approach that allocates 25% of the growth increment to Centers, TOD Corridors and Emerging Employment Centers recognizes that the 2007 Regional Plan policies may have increasing impact over time. Thus, the growth increment attributed to these policies increases from 2012 to 2032 in a linear fashion. Interpolation of jurisdictional population forecasts from 2012 to 2032 is the responsibility of each jurisdiction and is addressed in local population master plan elements, if desired. This consensus forecast establishes only the beginning (2011 certified estimates) and end points (allocated 2032 consensus forecast by jurisdiction) of that forecast series for each jurisdiction through the year 2032.

Analysis of the 25% population increment (34,795 persons) allocated to each jurisdiction's Centers, TOD Corridors and Emerging Employment Centers (EECs) yielded the following assumptions based on corridor, center and emerging employment center land areas and density assumptions:

- 21.3% (i.e. 85.2% of 34,795) of the increment will be allocated to the City of Reno (29,645 persons);
- 3.7% (i.e. 1.48% of 34,795) of the increment will be allocated to the City of Sparks (5,150 persons).

While the City of Sparks has major emerging employment centers in its jurisdiction, it is recognized that these EECs have lower densities than centers and corridors and that these EECs are located in or near to Sparks' traditional growth areas. Spark's EECs, however, are extremely important to jobs-housing balance and trip reduction policies.

In the near future, Washoe County is expected to designate at least one Secondary Transit Corridor and to designate Infill Opportunity Areas under the policies of the 2007 Regional Plan. Under the forecast approach of the Consensus Forecast, Washoe County may analyze the impact of these designations and include any appropriate and related population shares in its Population Element to be submitted to the Regional Planning Agency.

Allocation of the remaining (non-centers, corridors and EEC) growth increment (75% or 130,774 persons) to the jurisdictions is based upon a minor modification of the historic jurisdictional distribution of population, as follows:

Table 14**2032 Jurisdictional Distribution of Population (of remaining 75% of growth increment)**

City of Reno Year 2032 Allocation	50%	52,192 persons
City of Sparks Year 2032 Allocation	24%	25,052 persons
Unincorporated Washoe County Year 2032 Allocation	26%	27,140 persons

Table 15**Year 2032 Total Jurisdiction Forecasts**

Jurisdiction	2011 Certified Estimates	Centers, Corridors and EEC Increment	Remaining Increment	2032 Jurisdiction Forecast
Reno	222,801	29,645	52,192	304,638
Sparks	92,302	5,150	25,052	122,504
Unincorporated Washoe County	106,490	N/A	27,140	133,630
Total County	421,593	34,795	104,384	560,772

Appendix A

Consensus Forecasts in Planning

By Michael R. Sykes*

Externally produced macroeconomic forecasts are frequently used as an input to the planning process, often to provide the broad framework within which more specific questions can be addressed. However, the quality of the output is partially dependent on the quality of the macroeconomic inputs chosen. A consensus forecast aggregates the views of a number of leading macroeconomic forecasters who use different approaches and attach different weights to the importance of the various factors that impact the economy. Research suggests that few, if any, individual forecasters consistently outperform the consensus across a range of variables, although some forecasters may perform well for some individual series. Studies also suggest that the use of a consensus minimizes the risk of large forecast errors, which has obvious benefits for firms operating in sectors of the economy particularly sensitive to swings in overall economic activity. The consensus approach allows the user to examine the range or distribution of forecasts, and also permits comparison of individual forecasts, whether produced by external advisers or internal analysts, with the mainstream view.

MACROECONOMISTS generally summarize the economic outlook by producing projections for a handful of very broad aggregate indicators. On their own, these projections represent only a general template for planners looking at the outlook for a (comparatively) narrowly defined sector of the economy. But as most corporate and strategic

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planners know, in many industries macro forecasts are regularly used as inputs to the planning process, often to establish a starting point or a broad framework of assumptions within which the more specific problems under consideration can be examined.

For many businesses, product demand in a given market that is sensitive to the strength of economic activity may be well correlated with the behaviour of one or more broad macroeconomic indicators. For example, demand for semiconductor chips in many markets has historically been relatively well correlated with growth in overall industrial production, which is therefore often considered by sector analysts as the best indicator to use in predicting future chip demand. One major industrial company also focuses on expected industrial production growth in various (mainly European) markets, as an indicator of future demand for ball bearings and other products widely used in the industrial production processes.

Obviously, obtaining a reliable set of forecasts for a macroeconomic variable in various countries or markets is far from being the whole story: the relationship between industrial production and demand for computer chips may vary quite widely across markets, depending, for example, on the level of technology employed. Information or knowledge that is more specific to the industry, or to the past experience of the individual firm, also will be necessary. Thus, extrapolating historical relationships between demand for a product and a macroeconomic indicator is a widely used approach but is dependent upon the quality of both the interpretation of events and the macro benchmark forecasts used.

THE ECONOMIC CYCLE

In the short term, predictions of the timing of turning points in the economic cycle also can be invaluable in reaching decisions on production, inventory and Manning levels, marketing strategies

and pricing. In the trough of an economic cycle, weak demand is likely to mean that producers are facing strong competition for the few available orders, are running plant at well below full capacity and have cut inventory and manning levels. In spite of the rising unit labour costs that usually accompany a downturn in output, producers may be under considerable pressure either to cut prices or to offer significant discounts, and profit margins are inevitably squeezed. The question of whether to cut employment further in order to reduce costs, or possibly to close or scrap plant, will depend to a considerable extent on when and from what level the economy is expected to begin recovering. Producers will not wish to find themselves having cut capacity and employment as the economy is about to turn up, and also will wish to be well positioned from a marketing standpoint as demand begins to revive.

The economic cycle in different industrial sectors is frequently out of phase with that of the economy overall, however. In many countries, for example, construction sector activity turns down ahead of demand in the economy as a whole and often leads the revival. Producers of construction-related materials and equipment therefore also will feel the effects of a downturn and the subsequent revival relatively early. On the other hand, business investment often responds more slowly to a recovery in overall output, as producers first take up the excess capacity resulting from recession before investing in new plant. But even so, in examining either the short-term influence of economic cycles or the longer-term outlook, once a general relationship between demand for a particular product and a broad indicator of total output (such as gross domestic product [GDP] or industrial production) has been established, macroeconomic forecasts adjusted for leads or lags can be used to "drive" a more specific model of demand for the individual sector or product.

CROSS COUNTRY COMPARISONS

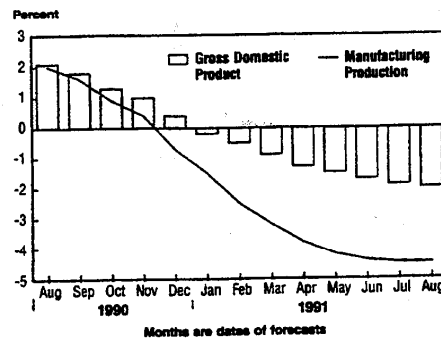
Over a longer time horizon, the expected *relative* performance of various economic indicators in different countries can be a useful guide in reaching decisions about the location of production units, distribution networks and marketing investment. Equally, expected developments in relative wage costs and inflation rates may have a significant bearing on investment or other location decisions. One of the problems here is likely to lie in finding forecasts for all the individual countries under consideration that have been produced on as simultaneous and consistent a basis as possible.

CHANGING EXPECTATIONS

Expectations regarding future trends in output, inflation or other macro variables can change quite rapidly over time, suggesting that forecasts for demand growth in different countries made even a few months apart might provide misleading comparisons. The outbreak of the Gulf crisis in August 1990, for example, marked the beginning of a nine-month period during which 1991 growth forecasts for most economies were revised sharply and continuously downwards. In the United Kingdom, where the gathering gloom was compounded by the realization that tight monetary policy was finally beginning to bite, the deterioration in the consensus outlook for GDP growth and Manufacturing Production was particularly severe (see Figure 1).

Such rapid shifts in expectations can obviously pose problems for companies where the planning cycle involves relatively infrequent reviews of the forecasts underlying the plan. A company conducting an annual forecast review for the United States in August 1990, for example, would, by the beginning of 1991, have found itself with a plan based on assumed GNP growth for 1991 of 2 percent. In the meantime, however, the average independent growth forecast had deteriorated to the point where the economy was expected to contract by around 0.3 percent. Changes in expectations of this magnitude, and wars in the Gulf, are thankfully relatively rare occurrences, but even under more normal circumstances, expectations can shift quite rapidly over a few months. Since the beginning of 1992, for example, consensus forecasts for growth in Japanese industrial production have declined

Figure 1
Consensus Forecasts for U.K. Growth
1991



from an average of +1.3 percent to the -3.0 percent now being predicted (early June 1992). Such developments highlight the need for a reliable stream of regularly updated forecasts and the close monitoring of shifts in expectations. In such circumstances a flexible approach to reviewing established plans outside the normal six months or one year cycle and a willingness on the part of business economists to raise the red flag are clearly important. It should at least be possible to draw the attention of others involved in later stages of the planning process to such developments, even if a full scale review is impractical. In view of the difficulties that may be involved in disrupting the planning process in this way, however, it is important that the forecasts used to trigger such changes derive from a consistent and credible source. The choice of this source is therefore an important decision.

THE FORECAST SOURCE

The choice of forecast source is complicated by the large number and wide diversity of economic forecasting operations. These may be large international consultancy-type firms specializing in economic forecasting and analysis, government or semigovernment institutions such as the OECD, university research units, divisions of major banks or securities firms, or the in-house economic units of large industrial companies. Our company surveys over 180 economic forecasters based in the G-7 countries and Australia every month (of which about 25 are in the United States), and this is by no means an exhaustive list of the available sources. Blue Chip Economic Indicators covers about 50 U.S. forecasters in its principal American panel.

Comparing forecasters' track records is made more complicated by the fact that forecast errors vary in type and can have different consequences for the forecast user. For example, forecasters may correctly predict the direction of change in a series, but get the magnitude wrong (under or overpredicting investment growth, for example). This kind of forecasting error is, however, probably less damaging to the forecast user than a prediction that gets the direction of change wrong (forecasting a rise when the series in fact falls). From the users' point of view, a forecaster who accurately predicts trends but fails to spot turning points may well deserve a lower rating than another who correctly predicts turning points but has a poorer track record at other times. More generally, a good track record does not guarantee consistent success. The fact that a forecaster performed well in predicting economic developments for one or two years does not mean that he or she will continue to do so. Indeed, some of

the more recent evidence from studies of forecasting accuracy (reviewed below) indicates that past success is no guarantee of future accuracy. The problem is compounded when forecasts for a range of different variables are considered. One forecaster may have a better track record on production growth, but a poor record on inflation. These results might be combined or weighted in some way, but how is a percentage error in forecasting inflation to be rated vis-a-vis an absolute error in volume terms in a forecast for housing starts, for example? The relative importance of the different variables will vary from user to user.

THE CONSENSUS APPROACH

All of this suggests that successfully differentiating among the large number of different forecasts available is a complex and challenging task. One possible solution to this problem of "picking winners" is to use aggregated or consensus forecasts, combining the predictions of a number of different forecasters into a single, mean forecast. The idea of using consensus projections is fairly well established in a number of countries, notably in the United States, where surveys of forecasters have been running for some time. Aside from reducing some of the problems of choice and weighting discussed above, the use of a consensus projection also appeals to many users because it does not rest on one particular view of the way an economy functions, but attempts to capture the information implicit in a range of forecasts. The results of these surveys have also attracted a good deal of academic interest and analysis, and several studies of the merits of consensus forecasting as an approach have been conducted.

Much of this work has concentrated on forecasts produced by various time series methods of extrapolation for individual series, although there have also been other studies comparing econometric and/or judgmental forecasts with the consensus. Most of these studies are based on data for the United States, where a long run of consistent back data is available from the surveys published in Blue Chip Economic Indicators over the past fourteen years.

As regards the accuracy of the consensus, the verdict of most of the academic work in this area has generally been favourable. In his study covering forecasts for seven variables made by twenty-two forecasters over nine years (1978 through 1986) Stephen McNees¹ concluded that "only four of the twenty-two individual forecasters were more accurate than the consensus in more than half their forecasts." For all seven variables weighted equally,

¹See footnote at end of text.

the consensus forecasts ranked 6 (out of 23, including the consensus) on the basis of the RMSE (root mean squared error) criterion.

In addition, McNees noted that:

"For any particular variable, the Blue Chip consensus was more accurate than most individual forecasters but less accurate than a minority of varying size depending on the predicted variable . . . Every forecaster, [except one], was more accurate than the consensus for at least one variable but none of the forecasters outperformed the consensus for all seven variables."²

Another study³ comparing seventy-nine individual forecasts of six macroeconomic variables with the group mean found that, on average, the consensus was more accurate than around three-quarters of the individual forecasts, although again this proportion varied depending on the variable considered. On the basis of this evidence, which is broadly consistent with our own experience, it seems reasonable to assume that for some variables some of the individual forecasts making up the consensus will prove to be more accurate than the group mean when the results become known. However, the problem for a user of external forecasts remains how to determine *in advance* which individual forecasters will be more accurate. This would be a relatively simple task if some forecasters were clearly superior to the others and consistently achieved better results.

In fact, the evidence on this question is rather mixed. Victor Zarnowitz⁴ examined forecasts submitted to the survey conducted by the American Statistical Association (ASA) and the National Bureau of Economic Research (NBER) from 1968 to 1979, and concluded (by comparing rank correlations of relative RMSEs across variables and forecast horizons) that "a small number of the more regular participants in the ASA-NBER surveys did perform better in most respects than the composite forecasts from the same surveys."

On the other hand a later analysis conducted by Roy Batchelor of the City University Business School⁵ in London concluded that there were "no significant differences in the accuracy rankings of individual forecasters." This conclusion supports the argument that, without the benefit of hindsight, it is extremely difficult to pick out an individual forecaster who is likely to outperform the consensus across a range of variables and time horizons. As noted above, however, for certain variables considered in isolation the evidence does suggest that selected forecasters can perform consistently well.

THE MARKET FOR FORECASTS

There are a number of problems involved with the use of consensus forecasts. One is the choice of which forecasters to include in the consensus. However, given the competitive nature of the forecasting business (large numbers of suppliers, fairly standardized products, very low or nonexistent barriers to entry, etc.) inaccurate forecasters, or those lacking professional credentials, might be expected to be driven out of business, leaving a group of forecasters producing work of a similar quality. This is supported by the Batchelor study, which finds no evidence of significant differences in forecasters' track records. In a separate study,⁶ Batchelor also finds that, perhaps because of this high level of competition in the forecasting business, some forecasters may attempt to differentiate their work by deliberately adopting a stance that is either pessimistic or optimistic in relation to their peers. Far from moving towards the consensus, some forecasters display "variety seeking" behaviour and attempt to distance themselves from the middle ground to some extent. Those that are determinedly optimistic year after year will almost certainly, at some stage, be proved correct when the outcome is better than the consensus predicted. Intuitively, this also ties in with the results showing that few forecasters beat the consensus consistently; neither the optimists nor the pessimists can always be right. This kind of behaviour probably reflects the fact that forecasts, like other types of information, are themselves a marketable commodity. From some perspectives, the middle ground may appear less valuable or interesting and thus more difficult to sell commercially. Thus accuracy may not always be the only consideration for the forecast producer, given that he is operating in a competitive market.

This leads to another caveat regarding the interpretation of consensus projections. The range or spread of different forecasts, which is often measured by the standard deviation of the sample, is frequently used as a measure of the "risk" or uncertainty attached to a consensus forecast. Clustering around the mean might, however, produce a range of forecasts that considerably understates the wide dispersion of likely outcomes, with the result that the deviation in the sample is considerably lower than the "risk" inherent in the forecast. This is reflected in the fact that the actual outcome for a particular variable is frequently outside the range of forecasts. In our experience, we have noted that the dispersion of forecasts may also vary widely from country to country. For example, the forecasts for the French economy produced (on a monthly basis) by a group of around sixteen French-based fore-

casters over the past two years have typically been much more closely grouped around the mean than those produced by a similar group of United States forecasters looking at the American economy. This may reflect structural differences between the two economies (the French economy may be more predictable, for example) or it may reflect more widespread attempts at product differentiation in the U.S. forecasting industry. So caution should be exercised when using forecast ranges to assess the uncertainty attached to the consensus. As always with a table of comparative forecasts, moreover, the astute analyst will endeavour to look past the numbers at the reasoning that lies behind them.

FOOTNOTES

¹Stephen McNees, "The Tyranny of the Majority," *New England Economic Review*, Federal Reserve Bank of Boston, Nov/Dec 1987.

²Ibid.

³Victor Zarnowitz, "The Accuracy of Individual and Group Forecasts from Business Outlook Surveys," *Journal of Forecasting*, Vol 3 (Jan-March 1984).

⁴Ibid, pp. 23-24.

⁵Roy A. Batchelor, "All Forecasters Are Equal," *Journal of Business and Economic Statistics*, 1990.

⁶Roy Batchelor and Pami Dua "Conservatism and Consensus-Seeking Among Economic Forecasters," Paper presented to the Ninth International Symposium on Forecasting, Vancouver, June 1989.

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Appendix B

Global Insight Background Analysis:

November 2011

Long-Term Forecast

Prepared by IHS GLOBAL INSIGHT

Washoe County, NV

PREFACE

This analysis accompanies a forecast prepared by IHS GLOBAL INSIGHT for the Washoe County Office of the County Manager. The forecast pertains to Washoe County, which comprises the cities of Reno and Sparks and the unincorporated remainder of the county. Some sections of this document will refer to the Reno-Sparks Metropolitan area, using it as an approximation of activity in Washoe County. These sections will be clearly marked using the notation Reno MSA.

RECENT PERFORMANCE

In 2010, Washoe County registered a total employment decline of 2.5% year-over-year (y/y), and this year has not been kind either. The Reno metropolitan area (MSA), which makes up the bulk of Washoe County, posted a y/y decline of 1% in October 2011, continuing a trend of job losses that began in late 2007.

The unemployment rate in the metro area is gradually receding from the painfully high rates reached during the recession, peaking at 14.6% in November 2010. By September of this year, unemployment had edged down to 12.8%, an encouraging trend, however the rate is still three times its 2007 pre-recession level.

Ironically, the MSA's construction sector, which was devastated over the recession, has been an unlikely source of payroll growth this year. The commercial construction sector is likely the key driver of these job gains, as the residential market remains in the doldrums.

Breaking down the local economy, we can get a better look at where the recession hit the hardest, and where the rebound is likely to come from:

- **Personal Income:** Personal income in Washoe County decreased by 5.1% in 2009, according to the Bureau of Economic Analysis, the latest data available. It is expected to increase at a modest pace in 2010 and 2011 as, according to IHS Global Insight analysis, the local economy slowly emerges from the recession.
- **Trade, Transportation, and Utilities:** This sector, which is the largest in the Washoe County economy (at 22% of employment), was healthy through 2007, but posted a decline of 2.2% in 2008, and plunged 8.7% in 2009 before losses decelerated to 3.6% in 2010. The pace of contraction has continued to decelerate this year; the Reno MSA registered an October decline of 2.2% y/y.
- **Services:** Leisure and hospitality employment, which includes accommodations and eating and drinking establishments, is the second largest employment sector in Washoe County and in the Reno MSA, accounting for close to 18% of total employment. This sector saw employment growth decline during the recession in 2001, and reached its lowest point in 2005. Thereafter, a strong national economy helped growth turn positive, and the sector remained strong through 2007, before turning down again beginning in 2008. That weakness carried through all of 2009 as a direct result of weak economic conditions and restrained consumer spending. However, the leisure and hospitality sector began to gradually turn around in the Reno MSA in 2010, and this year employment ticked higher by 400 jobs y/y in October 2011, though levels remain well below prerecession highs. The professional and business services sector was also hit

hard by the weak economy, after having being an economic strong point for several years. The education and health services sector, accounting for 12% of total employment, was the only major sector that was not pulled down by the recession and it advanced by another 2.7% y/y in October. Job growth in this sector remained steady even during the recessionary years because of inelastic demand for health and educational services.

- **Housing:** The combined construction and mining employment sector in Washoe County declined at a rate of 18.6% y/y in 2010, losing more than 2,000 jobs. While this was a painful contraction, it was less severe than the losses incurred over the previous few years. Fortunately, between October 2010 and October 2011, the Reno MSA construction sector began to recover and gained 300 jobs (or 3% y/y), which suggests that Washoe will likely see a modest increase in construction jobs this year. This does not necessarily mean that the woes in the construction sector are completely behind us, but it is a clear indication that the worst has passed. This is a welcome turnaround for this sector, where job levels are still more than 50% below their peak in early 2006, and are currently at levels not seen since early 1994. It will be a bumpy recovery, though - through September 2011, the number of permits issued year to date in the Reno MSA was 39.5% lower than in the same period in 2010, and in the third quarter of 2011, housing starts in the Reno MSA were down by 7.5% from one year earlier, according to IHS Global Insight data.
- **Manufacturing:** This sector accounts for 5.8% of total employment in Washoe County, and had flat to positive growth between 2003 and 2007 – indeed, the Reno MSA is one of the few metro areas in the nation that did not see significant declines in manufacturing through the early years of this decade, slowing only during 2002. Employment levels increased each year through 2007, but in 2008 the sector finally felt the impacts of the recession, leading to payroll losses that topped out in 2009, before decelerating in 2010. Declines in the Reno MSA continued into 2011 but less severely, and October saw a y/y loss of 500 jobs, one of the lowest amounts since the sector began its decline in 2008.

As mentioned above, leisure and hospitality employment is the second-largest sector in the Reno MSA, accounting for 18% of all jobs. This sector was dealt some major blows early in the decade, with the events of September 11, 2001, which affected tourism nationwide, and the increase in tribal gaming across the border in California. Both served to reduce tourism to the metro area. The area recovered, however, and through 2006 saw growth in gaming revenue. The numbers for 2007 through 2010 were mostly down as the state and national economies began to contract and consumers pulled back their spending on non-essential things like travel. For the fiscal year 2011, gaming win is down by 2.7% through the end of September, a decline that is close to the state as a whole.

DEMOGRAPHICS AND LABOR FORCE

The Census Bureau and IHS Global Insight estimated Washoe County's population to be 424,196 residents in 2010, up from 417,263 persons in 2009, confirming that population in the county continues to grow. The annual population growth rate between 2009 and 2010 was 1.7%, ranking 6th out of the sixteen counties in the state. Comparatively, growth rates in the Las Vegas metro area, in Nevada, and in the United States over the same period were 0.9%, 0.8%, and 0.9%, respectively.

Population data from the Census Bureau on cities and towns in the United States show that the city of Reno's population increased over the year by 2,027, to reach a total of 219,636 as of July 1, 2009, a growth rate of 0.9%. Since April 1, 2000, the city of Reno has seen population growth of 20%, which places it 49th out of the 276 areas with populations of more than 100,000. For the period between April 1, 2000 and July 1, 2009, North Las Vegas City saw an increase in population of 94% and Henderson City saw an increase of 46.1%, ranking them 3rd and 14th in the nation. The total number of households in Washoe County, a primary indicator of growing demand for housing units, infrastructure, and government services, rose from 134,719 in 2000 to 164,097 in 2010 (American Community Survey data). Average household size in Washoe County increased slightly from 2.55 persons in 2000 to 2.59 persons in 2010. In 2000, 70.9% of the population were 21 years and older, while 10.5% were 65 years and older; by 2010, these proportions had risen to 71.8% and 12.2%, respectively.

Washoe County's population density increased from 54.2 persons per square mile in 2000 to 66.9 persons per square mile in 2010. By comparison, Nevada's population density in 2010 was only 24.7 persons per square mile, while the U.S. figure was 87.6 persons per square mile.

In the Reno MSA, the seasonally adjusted unemployment rate was 12.8% in September 2010; by comparison, the rates for Nevada and the United States were 13.4% and 9.2%, respectively, in September. Both Reno's and Nevada's unemployment rates have surged over the past few years as a result of weak economic conditions.

Hampered by stubbornly high unemployment, the Reno MSA's total labor force has been steadily declining over the past 16 months. The metro area labor force slipped to a total of 213,839 persons in September 2011, a decrease of 3.8% from September 2010. Looking at the annual rates, labor force growth has been cyclical through this decade. Early on, growth slowed with the recession in 2001, and then picked up, reaching 2.9% in 2006. Growth decelerated in the years thereafter as the economy softened; the labor force contracted by 0.5% in 2010 and is on pace for another year of decline in 2011.

INCOME AND WAGES

According to the Bureau of Economic Analysis, in 2010 per capita personal income in the Reno MSA was \$41,783, the 56th highest in the United States, and well above the Nevada and U.S. figures of \$36,866 and \$39,894, respectively. The Reno MSA's 2010 per capita personal income was up 1% over 2009, compared to increases of 1% in Nevada and 2.8% for the United States. The weakness in per capita personal income growth can be attributed to the lag in the local economy as it slowly rebounds from the severe downturn. According to the BLS, in the first quarter of 2011, the average weekly wage in Washoe County was \$789, up 3.4% from the first quarter of 2010. The average weekly wage in Clark County (Las Vegas) was similar, at \$790, while the figure for the United States was \$935.

The State of Nevada has released the following average weekly wage data for industries in Washoe County and Nevada for 2010:

Average Weekly Wages, Annual 2010		
Sector	Washoe County	Nevada
Natural Resources and Mining	\$2,122	\$1,444
Construction	925	1,066
Manufacturing	998	968
Trade, Trans, & Utilities	736	717
Information	1,039	1,046
Financial Activities	1,016	956
Professional & Business Svcs	980	1,004
Education & Health Services	940	914
Leisure & Hospitality	419	570
Other Services	652	609
Public Administration	1,146	1,168
Total, All Industries	815	818

ECONOMIC STRUCTURE

Washoe County's 20 largest employers are listed below (as reported by the state of Nevada for the first quarter of 2011).

- Washoe County School District, elementary and secondary schools, 8,500 to 8,999 employees
- University of Nevada-Reno, colleges and universities, 4,000 to 4,499 employees
- Washoe County Comptroller, executive and legislative combined, 2,500 to 2,999 employees

- Renown Regional Medical Center, general medical and surgical hospitals, 2,000 to 2,499 employees
- Peppermill Hotel and Casino, casino hotels, 2,000 to 2,499 employees
- International Game and Technology, misc. manufacturing, 2,000 to 2,499 employees
- Silver Legacy Resort, casino hotels, 1,500 to 1,999 employees
- St. Mary's Hospitals, general medical and surgical hospitals, 1,500 to 1,999 employees
- Atlantis Casino Resort, casino hotels, 1,500 to 1,999 employees
- Grand Sierra Resort and Casino, casino hotels, 1,000 to 1,499 employees
- City of Reno, executive and legislative combined, 1,500 to 1,999 employees
- Eldorado Hotel and Casino, casino hotels, 1,000 to 1,499 employees
- Sparks Nugget, casino hotels, 1,000 to 1,499 employees
- Circus Circus Casinos - Reno, casino hotels, 1,000 to 1,499 employees
- Sierra Nevada Healthcare Systems, general medical and surgical hospitals, 1,000 to 1,499 employees
- Truckee Meadows Community College, junior colleges, 900 to 999 employees
- United Parcel Service, couriers, 900 to 999 employees
- Harrah's Reno, casino hotels, 800 to 899 employees
- West Customer Management Group, telemarketing bureaus 800 to 899 employees
- Cal-Neva Club, casinos (except casino hotels), 600 to 699 employees

Of the MSA's 20 largest employers, nine are casinos. Because of the dominant presence of the casino industry, Washoe County has a unique economic structure compared to the U.S. economy. The leisure and hospitality sector, which includes accommodations and eating and drinking establishments, accounted for 18.1% of Washoe County's total employment in 2010, compared to 10% for the U.S. economy. Because of the large declines in the construction industry in recent years, the combined construction and mining sector accounted for only 4.9% of Washoe County's total employment in 2010, down from 10.8% in 2006. The concentration is now near the U.S. average of 4.8%, it was almost twice as large just four years prior. The metro's manufacturing sector is relatively small, accounting for 5.8% of Washoe County's 2010 employment, compared to 8.9% in the United States.

The following table compares employment distribution by major sector for Washoe County, Nevada; the Mountain Census region (i.e., AZ, CO, ID, MT, NV, NM, UT, and WY); and the United States. The table confirms the importance of the leisure and hospitality sector in both Washoe County and in Nevada, and shows clearly how much the structure of their economies varies from the rest of the Mountain region states and from the United States.

Employment by Sector, Annual 2010 (NAICS) Sector				
	Washoe County	Nevada	Mountain	US
Construction and Mining	4.9%	6.4%	6.5%	4.8%
Manufacturing	5.8%	3.4%	5.9%	8.9%
Trade, Transportation, and Utilities	21.7%	18.7%	18.8%	19.0%
Information	1.2%	1.1%	2.1%	2.1%
Financial Activities	4.7%	4.7%	5.8%	5.8%
Professional and Business Services	12.9%	12.1%	13.1%	12.9%
Educational and Health Services	11.7%	9.0%	12.8%	15.1%
Leisure and Hospitality	18.1%	27.7%	12.9%	10.0%
Other Services	3.7%	3.0%	3.6%	4.1%
Government	15.4%	13.9%	18.5%	17.4%

To gain even greater insight in to the local economy, IHS Global Insight conducted a shift-share analysis to identify the changes in Washoe County's economic structure during the last 20 years. This change, as measured by the distribution of private sector employment by three-digit NAICs code, was compared to the employment

changes that occurred in the United States over the same period. The purpose of the analysis was to identify four types of economic sectors, enumerated below.

Type D: Competitive Advantage and Specialized. Competitive advantage means that an individual sector's employment growth rate in Washoe County over the last 20 years was higher than its employment growth rate at the U.S. level over the same period. Specialized means that the same sector's percent share of total Washoe County employment is higher than the sector's percent share of total U.S. employment (i.e., its location quotient is >1.0). Sectors in this category are major sources of growth in a regional economy, as they have both above-average shares of regional activity, and above-average growth rates. Higher growth rates for these sectors presumably occur because of competitive advantages (e.g., labor costs, agglomeration effects, skilled labor, proximity to market, lower cost of living, etc.) that attracted them into a region in the first place. Approximately 59.7% of Washoe County's 2010 employment, or 91,826 workers, are in sectors classified as type D. The top-five sectors in this category, based on total employment, are:

- Administrative and Support Services (NAICS 561)
- Food Services & Drinking Places (NAICS 722)
- Professional, Scientific, and Technical Services (NAICS 541)
- Ambulatory Healthcare Services (NAICS 621)
- Hospitals (NAICS 622)

While this analysis excluded the government sector, both the federal and local government sectors are definable as Type D sectors.

Type C: Competitive Advantage but not Specialized. This type consists of sectors whose employment growth rate in Washoe County over the past 20 years was higher than the sector's growth rate at the U.S. level, but also where the current shares of total county employment are less than their shares of total U.S. employment. Economic sectors classified as Type C present targets of opportunity, as Washoe County may have competitive advantages that enable these sectors to achieve above-average growth rates. Approximately 11% of Washoe County's 2010 employment is classified as Type C. The top-five private sectors in this category, based on total employment, are:

- Religious, Civic, and Professional Organizations (NAICS 813)
- Credit Intermediaries and Related Services (NAICS 522)
- Nursing and Residential Care Facilities (NAICS 623)
- Insurance Carriers and Related Services (NAICS 524)
- Educational Services (NAICS 611)

Type B: Competitive Disadvantage but Specialized. This type is comprised of sectors whose employment growth rates in Washoe County over the last 20 years were below their employment growth rates at the U.S. level, but whose share of total Washoe County employment is higher than their shares of U.S. employment. Type B sectors often comprise major parts of a region's economy, but their boom years are in the past. Approximately 26.6% of Washoe County's 2010 employment is classified as Type B. The top five private sectors in this category, based on total employment, are:

- Accommodations (NAICS 721)
- Specialty Trade Contractors (NAICS 238)
- Amusement, Gambling and Recreation (NAICS 713)
- Social Assistance (NAICS 624)
- Real Estate (NAICS 531)

Type A: Competitive Disadvantage and not Specialized. This type is comprised of sectors whose employment growth rates in Washoe County over the last 20 years were below their employment growth rates at the U.S.

level and whose share of total Washoe County employment is less than their shares of U.S. employment. Type A economic sectors make little contribution to new regional economic growth, and sectors in this class comprised only 2.6% of Washoe County's total employment in 2010. The top five sectors in this class are:

- Telecommunications (NAICS 517)
- Retail Trade – Gasoline Stations (NAICS 447)
- Securities & Other Financial Investments (NAICS 523)
- Air Transportation (NAICS 481)
- Animal Production (NAICS 112)

Our IHS Global Insight analysis also estimated that the high-technology sector (NAICS definition) would be classified as Type A, accounting for 3.7% of the Reno MSA's total non-agricultural employment in 2010, well below the sector's average share of 6% for the United States.

Additionally, IHS Global Insight calculated the Hachman Index of structure diversity for the Reno MSA for 2010. The purpose of this index is to compare the economic structure of a MSA or state to the structure of the U.S. economy. The closer the index value is to 1.0, the more similar the structure of the MSA or state economy is to the structure of the U.S. economy. In general, larger economies such as those for big states and MSAs tend to be more economically diverse and have higher index values than the economies of smaller states and MSAs that may specialize in certain industries based on their competitive advantages. Economic structure is measured by the distribution of an economic indicator, such as employment, income, output, or business establishments, by NAICS code. IHS Global Insight used private employment at the three-digit NAICS code level as obtained from our Business Markets Insight database. This database includes estimates for self-employed workers, and thus is larger in scope than employment data from the Bureau of Labor Statistics' current employment survey. Consideration of self-employed workers is important in regional economies dependent on tourism because these economies usually have larger proportions of self-employed workers and sole proprietors in the retail and services sectors.

Given its unusual dependence on the tourism and gaming industry, one would expect that Washoe County's index of structural diversity would be low, making the structure of its economy significantly different than the structure of the U.S. economy. Indeed, in 2010, the index of structural diversity for Washoe County was 0.215. Similarly, the structure index value for the State of Nevada was 0.307 in 2010, the second lowest value among all the states. These results show that Washoe County's economy is far less diverse than the nation, on average, but only slightly less diverse than the state economy. As a basis of comparison with its neighbors, the structural index value for the State of California was 0.893 in 2010, the 3rd highest value among all the states; in Utah the index was 0.902, the 9th highest in the nation; and in Arizona the index was 0.910, the 6th highest.

REGIONAL ECONOMIC OUTLOOK

This year the Mountain region is finally emerging from the recession, posting positive job growth through the first three quarters of 2011. This follows three consecutive years of declines from 2008-2010 as the Mountain region endured a reversal of its boom over the middle of the decade. The national slowdown, largely driven by a downturn in the housing sector – both in construction and finance – has impacted all areas of the regional economy, and although conditions are improving it will take time before the Mountain region is back to full speed.

Western States

Hit hard by the recession, the region's job growth finally returned to positive territory this year, with an employment gain of 1.6% year-over-year (y/y) in October 2011, ranking third among the nine Census regions. The South Atlantic region posted the smallest gain, at 0.5%, while the West South Central region saw the fastest growth, at 2.1%. In the Mountain region, all states experienced job growth, with Utah leading the way, at 2.6% y/y. The worst-performing states were New Mexico (up 0.6%) and Idaho (up 0.7%).

While the Mountain region saw economic pain spread to nearly all sectors of its economy during the recession, the beginning stages of the recovery have been almost equally widespread. The professional and business

services sector and the trade, transportation, and utility sector, which together account for more than one-third of the region's total jobs, have grown consistently through the first three quarters of this year. The leisure and hospitality sector accounts for 13.3% of the regional economy, the largest share among the nine regions, and well above the national average of 10.2%. This sector has been the top performing this year, up 4.2% y/y in October. Nevada, which accounts for just 12% of the Mountain region's employment, comprises a fourth of its leisure and hospitality payrolls. In 2009, during the height of the recession, Nevada's ever important gaming industry was hit hard by shaky consumer confidence, which kept people away from the tourist hotspots, in addition to people cutting back on such luxuries such as eating out and travel. However, this is working in the opposite direction now, with tourism ramping back up as consumer sentiment improves and pent-up demand for leisure activities is attracting people back to the Mountain region. Meanwhile, education and health services continues to expand heartily thanks to the inelastic demand for health services and the region's fast growing share of residents over the age of 65. In fact, this sector was the only one that expanded every year from 2008-2010 when most were in decline.

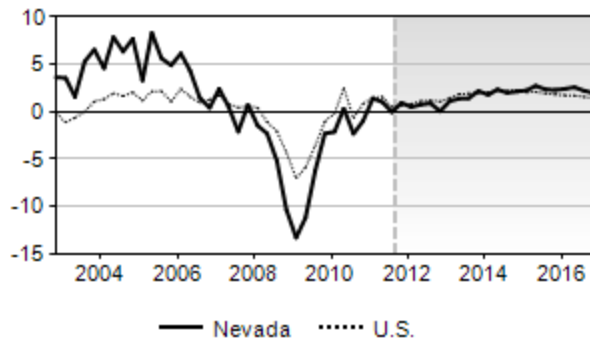
Currently, the main drags on the regional economy are coming from the finance, information, and government sectors. The finance sector has not yet recovered from the collapse in the housing market and the ensuing fallout in the financial markets. Through the third quarter of 2011, financial payrolls have been on the decline for an astonishing four and a half years, or 18 consecutive quarters. The government sector, which lagged the initial downturn, is now facing pressure to cut jobs in the face of lower tax revenues. State and local government employment hit the skids in 2009, and will remain in decline through next year as states get their finances in order.

Total employment in the Mountain region declined by 1.5% in 2010, on the heels of a sharp 5.9% drop in 2009. Fortunately, payrolls have reversed course in 2011 and we expect a 0.9% gain for the year. Job losses in financial services and government will be more than offset by broad-based gains in most of the other key employment sectors. The Mountain region is made up of states that were at the forefront of the housing boom, and have thus been affected by the bust more so than other areas. From 2007 to 2010 the region purged 340,000 construction jobs, with more than half of those losses coming from Arizona and Nevada alone. While these deep cuts are painful, with bubbles come extremes at the top and bottom meaning that when the housing market recovers over the next decade there will be more room for growth because it is starting at such a low base. The region is also home to states that benefited from the natural resource boom. These states have weathered the economic downturn fairly well so far. Wyoming, Colorado, and Montana were the best performing in the region from 2008-2011 but their recoveries will not be as strong as the hardest hit states in part because they not coming back from as severe losses.

Nevada

Economy in 2011: Employment here is expected to grow in 2011 for the first time in three years, with a 0.1% gain projected; growth will remain positive over the next five years, averaging 1.7% annually through 2016. Educational and health services will continue to see strong growth over the medium term, averaging a solid 2.2% through 2016. Construction losses will remain a drag on growth in the near term, but much less so than in years prior. Personal income growth will be sluggish, as consumers and businesses remain cautious, but income growth in 2011 will be notably stronger than the last three years as the state already endured the worst of the downturn. Nevada's population growth, which has been decelerating since 2007, will start to pick up over the latter part of this year and help push employment and housing growth in the coming years.

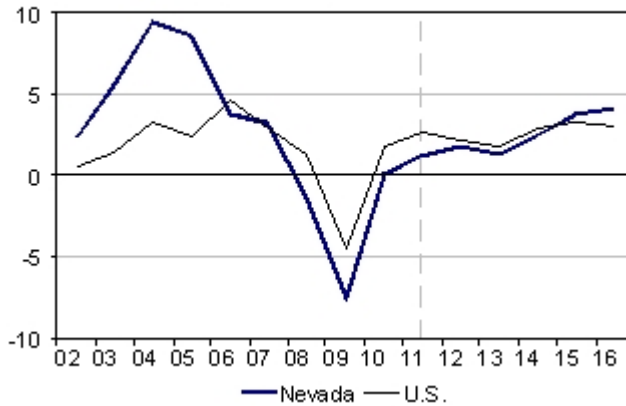
Total Employment
(Quarterly change, compound annual rate)



Economy through the Next Five Years:

Nevada, one of the fastest-growing states in the country for most of the last two decades, was hit hardest of all by the housing bust and Great Recession. Employment growth will accelerate modestly in 2012 with a gain of 0.6%, 39th among states. Gradual improvement thereafter will result in the regaining of 2007 employment levels only by 2020. The unemployment rate will recede from double-digit levels only in late 2015. The strongest sectors over the forecast period will be professional and business services and construction. Personal income growth will slow in the near term, before bouncing back along with the rest of the economy.

Real Personal Income
(Percent change, annual rate)



Housing:

The housing market in Nevada continues to decline, with few signs of the bottom being reached. According to the Federal Housing Finance Agency’s purchase only index, home prices dropped another 3.6% during the second quarter of 2011—and we expect further declines before a bottoming out in late 2012. Fueled by high employment growth, high population growth, and a low-interest-rate environment, housing prices in the state skyrocketed beginning in 2004. Price increases were also boosted by investor activity in the market. As 2006 ended, home sales were slowing and price growth was nearly flat. Beginning in 2007, prices began to decline in reaction to an excess supply of homes for sale—many of which are now empty, resulting in a homeowner vacancy rate of 4.6%. This is largely due to the lax lending standards leading up to the crash that left Nevada with a large pool of subprime mortgages (seventh highest in the country). As many as 25% of these subprime

loans went into foreclosure – one of the country's highest foreclosure rates. For growth to return, the current inventory of homes needs to be absorbed so new homes can be built again. Some good signs are that home vacancy rates are easing from the recessionary highs, and the percent of mortgages in foreclosure has fallen to 7.9%, down from over 10% a year earlier. Although these figure are still very high, a falling vacancy and foreclosure rate indicates that at least some progress is being made even though a strong recovery is not imminent.

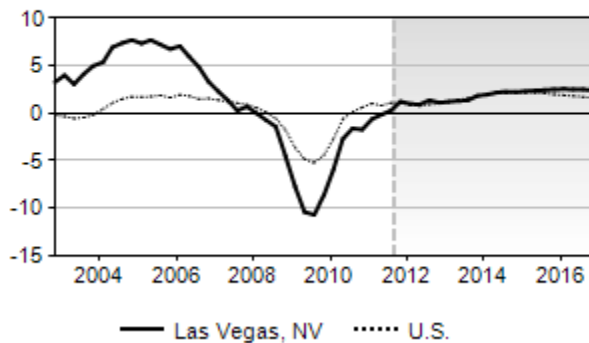
With a dropping vacancy rate, it looks as if housing starts have bottomed out at 5,100 (annualized) in the third quarter of 2010. Starts are not expected to hit prerecession levels for another decade.

Las Vegas

Economy in 2011:

Total employment fell another 3% in Las Vegas in 2010, but 2011 will be a different story. Following growth in two of the first three quarters of this year, employment growth is now seen as rebounding. The vast majority of the gains are coming from three sectors: professional/business services, education/health, and leisure and hospitality. Professional and business services will show consistent and increasing payroll additions and will be one of the city's fastest-growing sectors in the near and mid-term. Education and health, which is typically a consistent grower, will continue to perform well over the medium term. Ultimately, however, the Las Vegas economy will only go as far as the leisure and hospitality sector can take it. Representing 33% of total employment, sustained growth in leisure and hospitality is essential to an employment recovery in Vegas. Over the first three quarters of 2011, we saw just that, as the sector added nearly 9,000 new jobs. Although expectations should be tempered by the volatility in the sector and the fact that it is bouncing back from an absolutely miserable 2008-2009, employment numbers should return to just under 2008 highs by the end of 2012. Overall, in the near term Las Vegas will make concrete steps toward a recovery. For a full recovery to be realized, however, the city will need to see a turnaround in construction employment, which will decline through the rest of 2011. The accompanying cuts in government payrolls will not help matters for the still struggling gaming and vacation hot-spot.

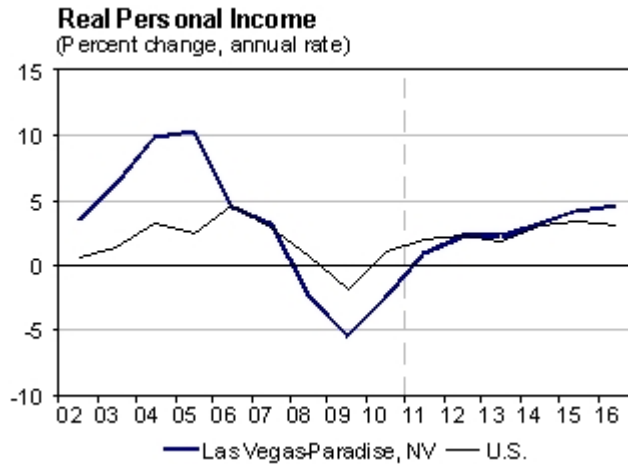
Total Employment
(Quarterly change, compound annual rate)



Economy through the Next Five Years:

Las Vegas has, in recent history, been one of the fastest growing metro areas in the nation, in terms of both its population and its economy. Although it has been hit particularly hard by this past recession, in large part because of its real estate market, strong population growth will not only continue here but is expected to help pull the metro out of its decline. Population growth will average 1.3% per year over the next five years, which will aid the expansion of employment by creating more demand for homes and services. Total employment numbers will continue to rise through 2011, and will expand 1.9% annually during 2011–16. One of the strongest gainers

will be construction, which will average 4.4% annual growth during that period as it attempts to recoup some of the massive recessionary layoffs. Also posting large employment gains will be professional and business services, which will become more prominent in the Las Vegas economy by averaging an impressive 5.1% annual growth over the next five years. Significant employment gains and rising wages will cause personal income growth to rise steadily from 2011 to 2016, averaging better than 5% annual increases over that period. Still, total employment will not reach pre-recession levels until 2019 and the housing market will continue to lag behind. If Las Vegas hopes to recover more quickly, the key lies in its largest sector: leisure and hospitality services. Unfortunately, Las Vegas is highly leveraged in a sector that does not have vibrant growth prospects. Leisure and hospitality will average just 0.4% annually from 2011-16 at the US level and even though Las Vegas will outpace that with 1% annual growth it will not be fast enough to jump start a fast recovery.



Housing:

The real estate downturn was a major factor for many metros in this past recession, and Las Vegas is no exception. Currently, the metro area remains in a housing slump, with excess inventory and declining prices. The median home price in Las Vegas has collapsed since the recession first hit. From its 2007 peak of \$295,000 the median price plummeted over 60% to \$110,830 as of the second quarter of 2011. The housing boom left the metro area with an excess inventory of housing that will need to be burned off before the market can return to a positive growth trend. The metro area was also a "hotspot" for speculative activity, and as these investors pulled out of the market, there was a buildup of inventory. Foreclosure activity, which has soared in the state, has also added many homes to the market. As a result of this excess supply of homes, construction activity has slowed significantly, with housing starts down substantially.

This is not to say that there is not still residential activity going on in the metro area. Some 80 miles north of Las Vegas, in Mesquite, Pulte Homes, one of the nation's largest home builders, has broken ground on a master-planned community that will have more than 4,000 homes when completed. The first was ready for residents in early 2008, with the entire community planned for completion by 2013. Focus Property Group also has several planned communities in the works: one in Henderson at Inspirada, and one in Las Vegas called Kyle Canyon Gateway. Also in Henderson, Plise Development & Construction has broken ground on its \$2-billion City Crossing project. The mixed-use project will have office space, retail, hotels, residential units, and outdoor areas spread over 126 acres..

FORECAST SUMMARY

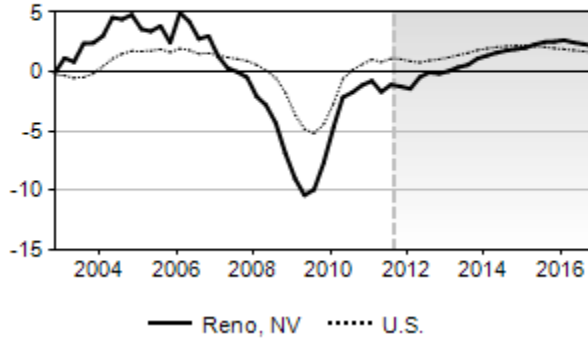
Economy in 2011:

Total employment in the Reno-Sparks metropolitan area will decline again in 2011, by 1.2%. Though employment continues to fall year-over-year, the 1.2% contraction of 2011 represents a vast improvement over

declines of 2.5% and 9.3% in 2010 and 2009, respectively. Poor second and third quarters are the source of this year's weak employment numbers. Pulling down payrolls in the second quarter were the struggling trade, finance, and government sectors with all of those seeing significant cuts. The trade sector will rebound in the coming quarters, but the finance and government sectors will continue to contract over the next year. The service sectors will be the biggest growing over the near-term led by professional/business, education/health, and leisure and hospitality. Unfortunately, construction payrolls will regress back to decline after showing promise over much of 2011, indicating that builders in the industry do not yet have confidence in the housing recovery.

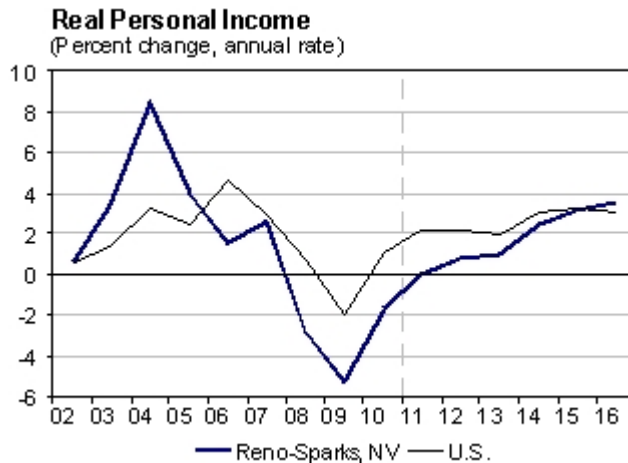
Total Employment

(Quarterly change, compound annual rate)



Economy through the Next Five Years:

Population in the Reno-Sparks metropolitan area is expected to grow at an average annual rate of 1.7% over the next five years, which will spur continuing gains in the service sector and help pull the metro economy out of recession. Rebounding growth will be led by the professional and business services sector, adding an average of 3.8% to payrolls from 2011 to 2016. The education and health services sector will also see strong growth as it keeps up with a population that is progressively getting older. Leisure and hospitality, which is a large component of the metro economy, will see stable, though underwhelming, growth of 0.6% per year through 2016. One of the biggest boons to the job market will be the resurrection of the construction sector, which will see a brief rebound in 2011 thanks to an improving economy, but fall back down again in 2012 while excess inventory is worked through. Thanks to a strong 2014–16, though, construction and mining will add 4.6% yearly to payrolls over the next five years. During 2011–16, IHS Global Insight forecasts Reno will average 1.3% annual job gains. This rate would be considered very healthy for normal times, but during a recovery from job losses on the scale that Reno faced the past few years it is rather pedestrian. By year-end 2016 employment in Reno will still be well below its 2007 highs, meaning that the "Biggest Little City in the World" will be recovering from the Great Recession for the entirety of the next decade. Thus, while things will certainly improve for the area in coming years, the long-term outlook for the area remains rather bleak.



Housing:

The residential housing market in Reno has been hit very hard by the housing downturn, as has the housing markets in many other metro areas in the nation. At issue is an excess supply of housing that needs to be absorbed before the market can see any equalization between supply and demand. During the boom, demand was much higher than supply, leading to accelerated rates of price appreciation (27.5% in 2005, for example). As demand has fallen off and the overall economy has seen slower growth, price appreciation has taken a turn for the worse. As of the second quarter of 2011, Reno's median home price was \$142,900, having declined in all but one quarter of the past three years. This has led to a staggering 56% crash in the median price from its peak of \$327,200.

LONG-TERM OUTLOOK

Table 1 shows that we forecast employment growth in Washoe County to expand by an average rate of 1.3% between 2011 and 2016, with employment growth remaining stable after 2020, when it will grow at an annual rate of 1.4%. The highest long-term employment growth will be seen in the service sectors. The personal income growth rate will remain steady over the 25-year forecast horizon at about 4.4%, although it could rise if economic development policies are able to attract additional high-paying jobs to the region. Finally, we forecast that real gross county-level product will grow at an annual rate of 2.4% over the next five years. By comparison, the growth rate for Nevada's real GSP during that time will be slightly faster at 2.7%.

Table 2 presents a special population forecast prepared by IHS Global Insight for 2011 through 2036. Over the next five years, we forecast an annual population growth rate of 0.7% which is a departure from the 2.3% annual growth rate recorded between 1990 and 2011. Over the longer term, we forecast that total population will grow at an annual rate of 1.1% over the next 10 years, and 1.6% over the 25-year period between 2011 and 2036. The fastest-growing age cohorts over the next 25 years will be the over 85 years old, 80 to 84 years old, 75 to 79 years old, and 70 to 74 years old cohorts. By contrast, annual population growth rates in the cohorts containing working age population between the ages of 25 and 55 will be much lower, with the highest growth rates in the 45 to 49 years old, and 50 to 54 years old cohorts.

As shown in Table 2, over the 25-year forecast period, we forecast that Reno's annual household growth rate will be 1.7%, close to the population growth rate over the same period. However, between 2011 and 2016, the differential between the household and population growth rates will be greatest, with households growing at 1.1% during this period compared to annual population growth of 0.7%. This differential is due to the household size decreasing following the Great Recession. An improving housing market will spur pent up demand for new units and in turn drive household growth as young adults move out of their parents house, roommates disband to get their own residence, and homelessness eases. After 2021, we forecast an average annual household growth rate of 2%, with the largest growth rates occurring in the 65 years and older cohorts.

Appendix C

Woods and Poole Background Data

Chapter 2. Technical Description of the Woods & Poole Economics, Inc. 2012 Regional Projections and Database

Introduction

The Woods & Poole Economics, Inc. database contains more than 900 economic and demographic variables for every county in the United States for every year from 1970 to 2040. This comprehensive database includes detailed population data by age, sex, and race; employment and earnings by major industry; personal income by source of income; retail sales by kind of business; and data on the number of households, their size, and their income. All of these variables are projected for each year through 2040. In total, there are over 200 million statistics in the regional database. The regional model that produces the projection component of this database was developed by Woods & Poole. The regional projection methods are revised somewhat year to year to reflect new computational techniques and new sources of regional economic and demographic information. Each year, a new projection is produced based on an updated historical database and revised assumptions.

The fact that the proprietary Woods & Poole economic and demographic projections rely on a very detailed database, makes them one of the most comprehensive county-level projections available. A description of some characteristics of the database and projection model is contained in this chapter.

Overview of the Projection Methods

The strength of Woods & Poole's economic and demographic projections stems from the comprehensive historical county database and the integrated nature of the projection model. The projection for each county in the United States is done simultaneously so that changes in one county will affect growth or decline in other counties. For example, growth in employment and population in Houston will affect growth in other metropolitan areas, such as Cleveland. This reflects the flow of economic activity around the country as new industries emerge or relocate in growing areas and as people migrate, in part because of job opportunities. The county projections are developed within the framework of the United States projection made by Woods & Poole. The U.S. projection is the control total for the 2012 regional projections and is described in the "Overview of the 2012 Projections" chapter included in Woods & Poole publications.

The regional projection technique used by Woods & Poole — linking the counties together to capture regional flows and constraining the results to a previously determined United States total — avoids a common pitfall in regional projections. Regional projections are sometimes made for a city or county without regard for potential growth in surrounding areas or other areas in the country. Such projections may be simple extrapolations of recent historical trends and, as a result, may be too optimistic or pessimistic. If these county projections were added together, the total might differ considerably from any conceivable national forecast scenario; this is the result of each regional projection being generated independently without interactive procedures and without being integrated into a consistent national projection.

Woods & Poole Economics, Inc. is a small, independent corporation that specializes in long-term county economic and demographic projections. Woods & Poole's database for every county in the U.S. contains projections through 2040 for more than 900 variables.

The methods used by Woods & Poole to generate the county projections proceed in four stages. First, forecasts to 2040 of total United States personal income, earnings by industry, employment by industry, population, inflation, and other variables are made. In the 2012 Woods & Poole model the US. forecast included an estimate of the lingering impact of the 2008-09 recession using preliminary employment data for 2010 and 2011 from the Bureau of Labor Statistics. Second, the country is divided into 179 Economic Areas (EAs) as defined by the US. Department of Commerce, Bureau of Economic Analysis (BEA). The EAs are aggregates of contiguous counties that attempt to measure cohesive economic regions in the United States (a list of all EAs and their component counties can be found in Appendix 6 following this chapter); in the 2012 Woods & Poole model, EA definitions released by the BEA in May 2007 are used. For each EA, a projection is made for employment, using an "export-base" approach; in some cases, the employment projections are adjusted to reflect the results of individual EA models or exogenous information about the EA economy. The employment projection for each EA is then used to estimate earnings in each EA. The employment and earnings projections then become the principal explanatory variables used to estimate population and number of households in each EA.

The third stage is to project population by age, sex, and race for each EA on the basis of net migration rates projected from employment opportunities. For stages two and three, the US. projection is the control total for the EA projections. The fourth stage replicates stages two and three except that it is performed at the county level, using the EAs as the control total for the county projections.



The "Export-Base" Approach

The specific economic projection technique used by Woods & Poole to generate the employment, earnings, and income estimates for each county in the United States generally follow a standard economic "export-base" approach. This relatively simple approach to regional employment projections is one that has been used by a number of researchers (see [5] and [9]). Although this approach has been criticized by several empirical studies (e.g., [8]), given the availability of regional data it remains one of the most feasible methodologies.

Certain industrial sectors at the regional level are considered "basic." This means that these sectors produce output that is not consumed locally but is "exported" out of the region for national or international consumption. This assumption allows these sectors to be linked closely to the national economy and hence follow national trends in productivity and output growth. Normally the "basic" sectors are mining, agriculture, manufacturing, and the Federal government. In contrast, "non-basic" sectors are those such as retail trade, utilities, real estate, and construction, the output of which is usually consumed locally. The growth of the "non-basic" sectors depends largely on the growth of the "basic" sectors that form the basis of the region's economy.

Intuitively this approach has great appeal and there are numerous examples that seem to support the "export-base" theory. Automobile production in Detroit, for instance, is obviously much more sensitive to national and international price and demand for transportation equipment

2012 TECHNICAL DESCRIPTION

than to local demand. In Texas, oil and natural gas exploration and production are tied closely to the worldwide demand and supply of petroleum resources and not tied primarily to energy consumption in Texas.

Although the theory is appealing, some shortcomings do exist in the "export-base" approach. For example, some "basic" commodities produced locally are consumed locally. Producers of durable equipment used in other manufacturing processes are often affected not by the national demand for their product but by the regional demand. Machine tool makers that supply the local automobile industry in Detroit will prosper to the extent Detroit's automobile producers prosper. In Houston, the strength of the local oil industry will affect the demand and production of equipment for oil and natural gas production and exploration. In both of these instances, some durable manufacturing industries exist to serve local, not national, markets.

However, despite the shortcomings, the availability of relatively clean data for sub-national geographic areas makes the "export-base" approach very useful. The analytical framework for projections using the "export-base" approach entails estimating either demand equations or calculating historical growth rate differentials for output by sector. The principal explanatory variable, or the comparative data series for growth rate differentials, is the national demand for the output of that sector. Employment-by-sector data are often used as a surrogate variable since county output-by-sector data are not available; employment-by-sector data is used by Woods & Poole. Earnings projections are then obtained by using earnings-per-employee data either estimated as part of the model or imposed exogenously on the system. The complementary relationship could also be estimated, i.e., using an earnings forecast to derive employment based on earnings-per-employee data; this procedure has been used previously in some Woods & Poole regional models.

A modification of the "export-base" approach is used by Woods & Poole to account for regional variants to normal "basic"/"non-basic" industry definitions. Some "non-basic" sectors can be more appropriately modeled as "basic" sectors in certain regional economies. The finance and insurance sector or wholesale trade sector in New York City, for example, and the accommodation and food services sector in Las Vegas, are cases in which traditionally "non-basic" sectors are really "basic." New York is a worldwide financial and trade center and thus "exports" these services outside of the region; Las Vegas, as a vacation and entertainment center, similarly "exports" the output of its accommodation and food services sectors to other parts of the country. Activity in these sectors, in these specific geographic areas, is therefore linked more closely to the performance of these same sectors in the surrounding regions and the nation as a whole than to the other "basic" industries in the region.

A list of Economic Areas that have traditionally "non-basic" sectors modeled as "basic" sectors is presented in Table 1. Areas with "non-basic" sectors modeled as "basic" are those areas with a proportion of "non-basic" sector employment relative to total employment greater than 1.5 standard deviations above the national mean for a specific sector. With the exception of two sectors that are always considered "non-basic," construction and state and local government, all "non-basic" sectors are evaluated for each EA using this method (see [5]).

The remainder of the Woods and Poole technical documentation is available upon request.

Appendix D

The Nevada State Demographer's projections are developed using the Regional Economic Models, Incorporated (REMI) model through 2028.

The REMI model is a comprehensive model that encompasses a wide range of demographic and economic activity. It relates a region or set of regions to each other and the nation as whole. It also comes with differing levels of industrial detail. The model is used by the Nevada Commission on Economic Development, the Nevada Department of Administration, and the University of Nevada, Las Vegas. The model used in producing these projections is a 17 region model with a breakdown into 23 industrial sectors. Documentation about the model can be found at <http://www.remi.com/support/documents.shtml>.

The overall linkages of the REMI model are shown in Figure 1.

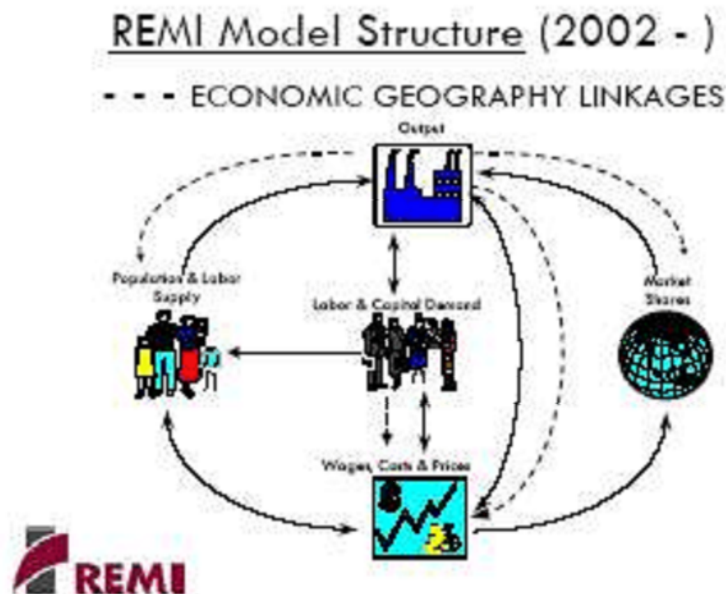
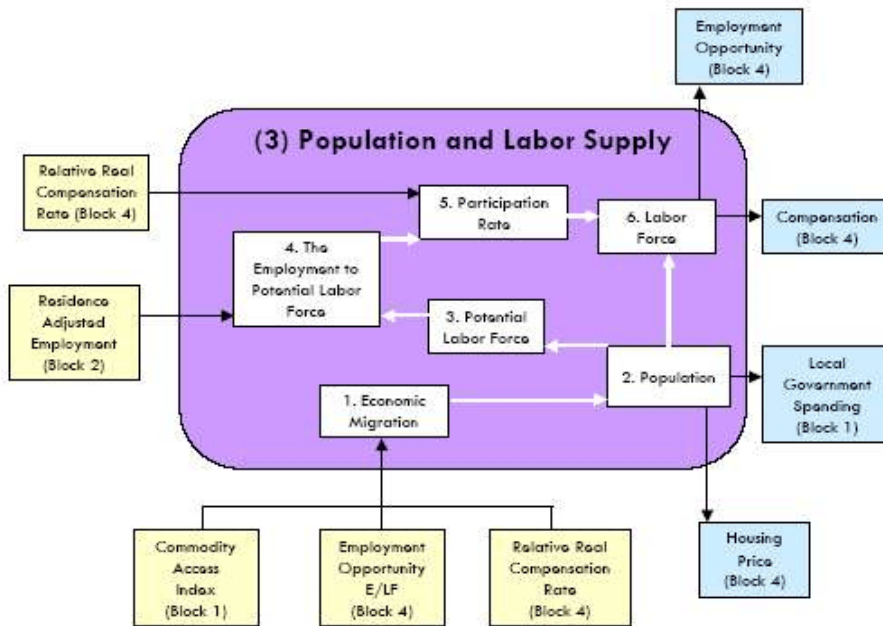


Figure 1

The REMI model comes with a baseline forecast, what has come to be referred to as an out of the box projection (see Appendix pages). The user can do things such as update employment for all sectors and by specific sectors through what are called policy variables. For the most part, those kinds of changes were made to the model in producing the projections. One area of concern in looking at the model was the performance of the Population and Labor Supply Block which is illustrated in Figure 2.

Figure 2:

Block 3. Population and Labor Supply



LIMITATIONS TO THE PROJECTIONS

REMI has a number of strengths. The model is under constant research and has been available for over 25 years. It has been examined and reviewed through peer-reviewed articles. The User Guide and other information is available to anyone with a computer, that is much of the detail of their methodology is publicly available. One of the major limitations with the model is that there is currently limited historic data from which it is built. This is because of the change from the Standard Industrial Classification (SIC) to the North American Industrial Classification System (NAICS) in 2001. Limited history limits the amount of information that a model can be constructed from for portraying the area that is being modeled. Another limit is that Nevada has a number of small counties as well as areas with limited numbers of employees or employers in various economic sectors. This leads to missing information through data suppression which REMI and this office has to then estimate values to substitute for that missing information.

Also, REMI is built on federal data including the annual estimates that are done by the Census Bureau. So any projections done within the model have to be re-based off of Nevada's generated estimates.

Appendix E

TMWA Background Data – additional documentation should be requested from TMWA.



Quality. Delivered.

Memorandum

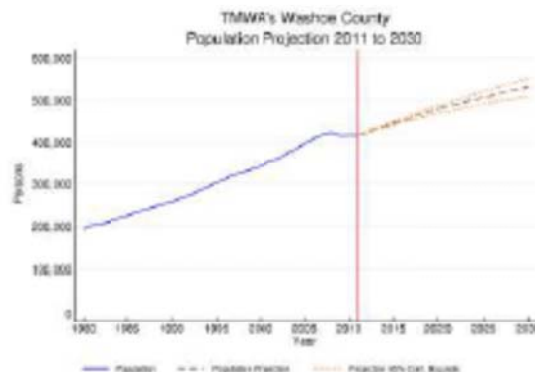
1355 Capital Blvd. • P.O. Box 30013 • Reno, NV 89520-3013
 ☎ 775.834.8080 • 📠 775.834.8003

TO: Distribution
 FROM: Shawn Stoddard, Senior Resource Economist
 DATE: January 4, 2012
 SUBJECT: Washoe County Population Projection 2011 to 2030

At the request of Washoe County, TMWA's population projections have been updated for inclusion in the County's Consensus Population Forecast. The population forecast is created using a logistic curve model as described in TMWA's 2010 to 2030 Water Resource Plan.

- The water resource plan (WRP) projected 440,000 persons in 2010, actual population was 417,379. This population decline is directly caused by the recession and collapse of the housing market.
- A population of 440,000 persons is not projected to occur until the year 2014, a four year deferral.
- The rate of growth compared to the WRP is also reduced. Current projection of 531,000 persons in 2030 was projected to occur in 2023, a seven year deferral in population growth and the need for associated facilities.
- As a direct result of the change in population growth, it might be possible to delay the timelines for many facilities by four to seven years.
- The population data used for this analysis is the published Nevada State Demographer's population estimates for years 1990 to 2010. Population for 2011 is estimated to be the same as 2010, 417,379 persons.
- The following Table and Graph shows TMWA's 2011 Population Projection.

Year	Population	Year	Population
2010	417,379	2021	484,698
2011	417,379	2022	490,541
2012	424,787	2023	496,216
2013	432,058	2024	501,722
2014	439,185	2025	507,059
2015	446,163	2026	512,228
2016	452,968	2027	517,231
2017	459,696	2028	522,069
2018	466,163	2029	526,743
2019	472,507	2030	531,256
2020	478,686		



Truckee Meadows Water Authority is a not-for-profit, community-owned water utility, operated by elected officials and citizen appointees from Reno, Sparks and Washoe County.

North Service Area Capital Improvements Plan

#	Project Description	Extent	Estimated Cost (2014 dollars)	RRIF Share	RRIF Funding
1	Additional Ramps	TBD - (5 ramps)	\$50,000,000	50%	\$25,000,000
2	Sparks Blvd (4 to 6 lanes)	I-80 to Baring Blvd	\$10,906,100	100%	\$10,906,100
3	Additional Intersections	TBD - (5 intersections)	\$15,000,000	50%	\$7,500,000
4	Traffic Signals / ITS / Roundabouts	locations to be determined as needed (avg of \$500,000 per year)	\$14,060,800	36%	\$5,000,000
5	McCarran Blvd Intersection	@ N Virginia St	\$4,326,400	100%	\$4,326,400
6	4th St/Prater Way	I-80 to Vista Blvd	\$23,443,800	14%	\$3,282,100
7	Oddie Blvd/Wells Ave	Phase 1 US 395 to Pyramid Way	\$20,009,600	14%	\$2,801,300
8	La Posada Dr Roundabout	@ Cordoba Blvd	\$2,163,200	100%	\$2,163,200
9	Oddie Blvd/Wells Ave	Phase 2 I-80 to US 395	\$13,852,800	14%	\$1,939,400
10	Sun Valley Blvd	2nd Ave to Pyramid/Sun Valley/395 Connector	\$9,626,200	14%	\$1,347,700
11	Pedestrian & Bicycle Facilities within ROW	based on Bike/Ped Master Plan	\$5,408,000	14%	\$757,100
12	Sutro St	I-80 to McCarran Blvd	\$1,601,800	14%	\$224,300
13	Keystone Ave	I-80 to 7th St	\$1,051,500	14%	\$147,200
14	Pyramid Hwy	@ McCarran Blvd	\$71,385,600	0%	\$0
TOTAL			\$242,835,800	27%	\$65,394,800
Revenue from Sources Other Than RRIF =>				73%	\$177,441,000

Attachment D, South Service Area Capital Improvement Plan

South Service Area Capital Improvements Plan

#	<i>Project Description</i>	<i>Extent</i>	<i>Estimated Cost (2014 dollars)</i>	<i>RRIF Share</i>	<i>RRIF Funding</i>
1	Additional Ramps	TBD - (5 ramps)	\$50,000,000	50%	\$25,000,000
2	McCarran Blvd (4 to 6 lanes)	Mira Loma Dr to Greg St	\$16,224,000	100%	\$16,224,000
3	Mill St Extension (4 lanes)	McCarran Blvd to SE Connector	\$14,817,900	100%	\$14,817,900
4	Pembroke (2 to 4 lanes)	McCarran Blvd to SE Connector	\$15,381,000	50%	\$7,690,500
5	Additional Intersections	TBD - (5 intersections)	\$15,000,000	50%	\$7,500,000
6	Wells Ave	Mill St to Kuenzli Ln	\$12,000,000	50%	\$6,000,000
7	Traffic Signals / ITS / Roundabouts	locations to be determined as needed (avg of \$500,000 per year)	\$14,060,800	36%	\$5,000,000
8	Kietzke Ln	Virginia St to Galletti Way	\$22,497,300	18%	\$4,049,500
9	4th St/Prater Way	Keystone Ave to I-80	\$15,493,800	18%	\$2,788,900
10	Virginia St	Plumb Ln to Liberty St	\$12,979,200	18%	\$2,336,300
11	Sparks Blvd (4 to 6 lanes)	Greg St to I-80	\$2,181,200	100%	\$2,181,200
12	Mill St/Terminal Way	Airport to Lake St	\$9,193,600	18%	\$1,654,800
13	Damonte Ranch Pkwy Intersections	@ I-580, Double R Blvd, Virginia St	\$1,622,400	100%	\$1,622,400
14	Keystone Ave	California Ave to I-80	\$8,250,300	18%	\$1,485,100
15	Oddie Blvd/Wells Ave	(Phase 2 Kuenzli to I-80	\$6,156,800	18%	\$1,108,200
16	Pedestrian & Bicycle Facilities within ROW	based on Bike/Ped Master Plan	\$5,408,000	18%	\$973,400
17	Sutro St	4th St to I-80	\$236,900	18%	\$42,600
18	Geiger Grade (4 lanes)	Virginia St to Toll Rd	\$57,108,500	0%	\$0
19	Plumb Ln	McCarran Blvd to Ferris Ln	\$6,489,600	0%	\$0
20	SouthEast Connector (6 lanes)	South Meadows Pkwy to Greg St	\$228,866,600	0%	\$0
TOTAL			\$513,967,900	20%	\$100,474,800
Revenue from Sources Other Than RRIF =>				80%	\$413,493,100

Regional Road Impact Fee Schedule

<i>RRIF Input Variables</i>			<i>North</i>		<i>South</i>	
Average Miles per Trip			2.87		2.82	
RRIF Share of CIP			\$65,394,800		\$100,474,800	
VMT Increase Over Ten Years			258,081		350,027	
Capital Cost per VMT			\$253.39		\$287.05	
<i>ITE Code</i>	<i>Development Type</i>	<i>Development Unit</i>	<i>VMT North</i>	<i>2014 RRIF North</i>	<i>VMT South</i>	<i>2014 RRIF South</i>
<i>Residential</i>						
210	Single Unit	Dwelling	14.93	\$3,784	14.67	\$4,212
220	2+ Units per Structure	Dwelling	9.70	\$2,457	9.53	\$2,735
<i>Industrial</i>						
110	Light Industrial	1000 Sq Ft	7.30	\$1,850	7.17	\$2,059
140	Manufacturing	1000 Sq Ft	4.00	\$1,013	3.93	\$1,128
150	Warehouse	1000 Sq Ft	3.73	\$944	3.66	\$1,051
151	Mini-Warehouse	1000 Sq Ft	2.62	\$663	2.57	\$738
<i>Commercial</i>						
820	Retail and Eating/Drinking Places	1000 Sq Ft Leasable	26.69	\$6,763	26.23	\$7,528
RTC	Casino Gaming Area	1000 Sq Ft	48.24	\$12,223	47.40	\$13,605
<i>Office & Other Services</i>						
320	Lodging	Room	5.90	\$1,494	5.79	\$1,663
412	Regional Park	Acre	2.39	\$605	2.35	\$673
520	Schools and Daycare	1000 Sq Ft	10.67	\$2,703	10.48	\$3,008
610	Hospital	1000 Sq Ft	13.85	\$3,509	13.61	\$3,905
620	Nursing Home	1000 Sq Ft	7.96	\$2,017	7.82	\$2,245
710	Office and Other Services	1000 Sq Ft	11.55	\$2,927	11.35	\$3,258
720	Medical Office	1000 Sq Ft	37.85	\$9,590	37.19	\$10,674