Population Forecasts: Long-Term Projections for Clark County, Nevada 2015-2050

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Prepared for

Regional Transportation Commission of Southern Nevada, Southern Nevada Water Authority, Southern Nevada Regional Planning Coalition, and members of the Forecasting Group

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Executive Summary

Each year, the Regional Transportation Commission of Southern Nevada (RTC), the Southern Nevada Water Authority (SNWA), the Southern Nevada Regional Planning Coalition (SNRPC), the Center for Business and Economic Research (CBER) at the University of Nevada, Las Vegas, and a group of community demographers and analysts work together to provide a long-term forecast of economic and demographic variables influencing Clark County's population growth. The primary goal is to develop a long-term forecast of the Clark County population that is consistent with the structural economic characteristics of the county. Toward this end, we employ a general-equilibrium demographic and economic model developed by Regional Economic Models, Inc. (REMI), specifically for Clark County.

The model recalibration incorporates the most recent available information regarding local employment growth, and local transit investment. The resulting long-term forecast predicts positive population growth throughout the range of the forecast. By 2035, we predict that Clark County's population will reach approximately 2.78 million. By 2050, we predict that it will reach nearly 3.11 million.

Table 1 summarizes the population forecast. The population in Clark County is predicted to grow at a rate of 2.1 percent in 2015. Despite short-term economic uncertainties and modeling difficulties, we note that this forecast is intended for medium- to long-term planning purposes. In the medium term, the population growth rate declines to 1.7 percent by 2018 as the Southern Nevada economy moves closer to maturity. In the long term, population growth begins to taper off as the maturing economy attracts fewer economic migrants. By 2030, annual population growth has declined to 1.1 percent. By

2050, the growth reaches 0.7 percent, slightly above the projected[1] long-term national population growth rate. This represents a long-term convergence to the national average annual population growth rate.

As is typical of any forecast, there are potential risks which could lead to either over- or underestimated population growth in the short run. The principal risk to our forecast is the recovery of the Southern Nevada economy in the short term. The assumption underlying this forecast is that the local economy will continue to recover in 2015 and 2016. To the extent that the near-term economic outlook differs, the short-run forecasts will differ. We believe, however, that these risks tend to arise from short-term uncertainty; whereas, our forecasts are primarily meant to be long-term planning tools.

[1]Source: http://www.census.gov/population/projections/data/national/2014.html

Table 1: Clark County Final Population Forecast 2000 - 2050			
Year	**Population Forecast**	**Change in Population Forecast**	**Growth in Population (Percent)**
2000	1,428,689*		
2001	1,498,278*	69,589	4.9%
2002	1,578,332*	80,054	5.3%
2003	1,641,529*	63,197	4.0%
2004	1,747,025*	105,496	6.4%
2005	1,815,700*	68,675	3.9%
2006	1,912,654*	96,954	5.3%
2007	1,996,542*	83,888	4.4%
2008	1,986,145*	-10,397	-0.5%
2009	2,006,347*	20,202	1.0%
2010	1,951,269**	-55,078	-2.7%
2011	1,966,630*	15,361	0.8%
2012	2,008,654*	42,024	2.1%
2013	2,062,253	53,599	2.7%
2014	2,102,238*	39,985	1.9%
2015	2,146,000***	43,762	2.1%
2016	2,191,000***	45,000	2.1%
2017	2,225,000	34,000	1.6%
2018	2,262,000	37,000	1.7%
2019	2,299,000	37,000	1.6%
2020	2,335,000	36,000	1.6%
2021	2,371,000	36,000	1.5%
2022	2,407,000	36,000	1.5%
2023	2,441,000	34,000	1.4%
2024	2,475,000	34,000	1.4%
2025	2,507,000	32,000	1.3%
2026	2,538,000	31,000	1.2%
2027	2,568,000	30,000	1.2%
2028	2,598,000	30,000	1.2%
2029	2,626,000	28,000	1.1%
2030	2,654,000	28,000	1.1%
2031	2,679,000	25,000	0.9%
2032	2,704,000	25,000	0.9%
2033	2,729,000	25,000	0.9%
2034	2,753,000	24,000	0.9%
2035	2,776,000	23,000	0.8%
2040	2,887,000	22,000	0.8%
2045	2,996,000	22,000	0.7%
2050	3,109,000	23,000	0.7%

* SNRPC consensus population estimate.
** 2010 U.S. Census.
*** CBER 2015 Economic Outlook forecast, December 2014.

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I. Introduction

Each year, the Regional Transportation Commission (RTC), the Southern Nevada Water Authority (SNWA), the Southern Nevada Regional Planning Coalition (SNRPC), the Center for Business and Economic Research (CBER) at the University of Nevada, Las Vegas, and a group of community demographers and analysts work together to provide a long-term forecast of economic and demographic variables influencing Clark County. The primary goal is to develop a long-term forecast of the Clark County population that is consistent with the structural economic characteristics of the county. Toward this end, we employ a general-equilibrium demographic and economic model developed by Regional Economic Models, Inc. (REMI), specifically for Clark County.

The REMI model is a state-of-the-art econometric forecasting model that accounts for dynamic feedbacks between economic and demographic variables. Special features allow the user to update the model to include the most current economic information. CBER calibrates the model using information on recent local employment levels, the most recent national Gross Domestic Product (GDP) forecast, and spending on local capital projects.

The model employed divides Nevada into five regions: Clark County; Nye County; Lincoln County; Washoe County; and the remaining counties, which are combined to form a fifth region. These regions are modeled using the U.S. economy as a backdrop. The model contains over 100 economic and demographic relationships that are carefully constructed to concisely represent the Clark County economy. The model includes equations to account for migration and trade between Nevada counties and other states and counties in the country.

The demographic and economic data used to construct the model begin in 1990, the most important of which include the aggregate totals of employment, labor force, and population. The economic data for the most recent version of the model (REMI PI+ v1.6) are consistent with the North American Industry Classification System (NAICS). The REMI PI+ v1.6 model was released in 2014. Hence the model's most recent data are from 2012 because the Bureau of Labor Statistics (BLS) personal-income data are reported with a two-year lag. Over the years, the availability of the income data has been the key in setting the last year of history in the model.

The REMI model is the best model available for describing how economies interact geographically.[2] These interactions may take place within a single economy (such as the interaction between house-price growth and employment growth in Clark County) or between two economies (such as the interaction between Southern Nevada and Southern California). These and over 100 other interactions contained within the model are too complex to consider modeling on our own. Rather, we turn to the REMI model because it has a solid foundation in economic theory and the principles of general-equilibrium-based growth distribution, yet it still offers the flexibility required to model a regional economy like Clark County.

To guarantee that the most current data are used in the forecast, we make a series of adjustments to the model. In this way, we ensure that the forecast model includes the best available information at the time the forecast is made. First, the model's national GDP forecast is updated using the latest available national forecast from the University of Michigan's Research Seminar in Quantitative Economics (RSQE). The second adjustment updates the model with the employment figures from the Nevada Department

[2] See Schwer, R. K. and D. Rickman (1995), "A comparison of the multipliers of IMPLAN, REMI and RIMS II: Benchmarking ready-made models for comparison," *The Annals of Regional Science*.

of Employment, Training, and Rehabilitation (DETR). Next, we include planned new investment in public infrastructure using information from RTC. Lastly, we rebase the population forecast to the most recent population estimate for Clark County available from SNRPC.

In the following section, we first examine the changes in the REMI model from the prior year's model. Following that, in Section III, we present sequentially the changes we make to update the model and tailor it to local information. In Section IV, we present the population forecast and give a brief discussion of the economic environment surrounding the forecast. In Section V, we compare the population growth forecast with previous years' forecasts. We conclude with a discussion of the risks to the forecast.

II. Comparison of REMI Models: Current and Previous Year

Over the years, we have compared the most recent out-of-the-box REMI models, that is, the current forecast before any model recalibrations are made, with corresponding out-of-the-box forecasts from the previous models. This gives us the opportunity to examine how the new model differs from the previous versions and to explore the basis of these differences.

The most recent data used to develop this year's model are from 2012. Thus, we refer to the current model as last historical year 2012 (LHY2012) and the previous model as last historical year 2011 (LHY2011).

Each year the REMI staff and users discuss the workings of the model and propose changes for improvement. Based on research findings, each year's model incorporates improvements in addition to the inclusion of more recent data. The new model, identified as PI+ v1.6, offers one major improvement; it includes an updated equation of trade flow parameters. The distance decay (beta) parameters and

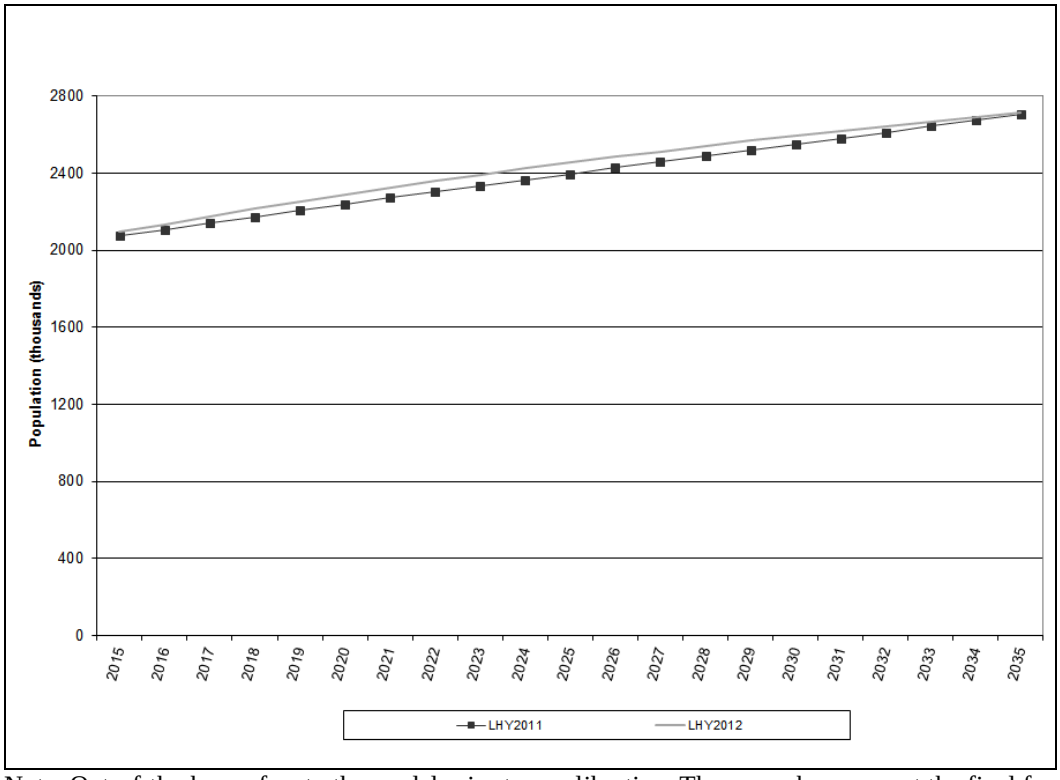
corresponding price elasticity of demand (sigma) parameters were reestimated based on state and county industry data for 1990 through 2012. In prior models, estimates of the trade flow parameters were based on data from 1990 through 2007. These model updates and the new data history for 2012 lead to the differences in the out-of-the-box population forecast between the LHY2012 model and the LHY2011 model.

Figures 1 and 2 compare the LHY2012 and LHY2011 population forecasts from the out-of-the-box models, i.e., without any updating for employment, infrastructure projects, or the national GDP forecast.[3] The out-of-the-box population forecast arising from the LHY2012 model predicts higher population levels for 2015 through 2035 than the LHY2011 model. With regards to population levels, the difference between the two forecasts is relatively small in 2014 but gets larger in the later years of the forecast. By 2025, the difference between the two forecasts begins to decline. By 2035, the out-of-the-box forecasted population in the LHY2012 model is roughly 6,000 people higher than in the LHY2011 model.

The higher out-of-the-box forecasted population levels from the LHY2012 model are due to the additional economic history from 2012 and the REMI's short-term economic migrant forecast for 2013 and 2014. The Las Vegas metropolitan area added 16,900 jobs in 2012. In addition, the LHY2012 model has a more optimistic forecast of economic migrants moving to Clark County for 2013 and 2014, 14,000 people, compared to the LHY2011 model's economic migrant forecast of 500 people for 2013 and 2014. This translates to the higher out-of-the-box population forecasts for the LHY2012 model compared to the LHY2011 model.

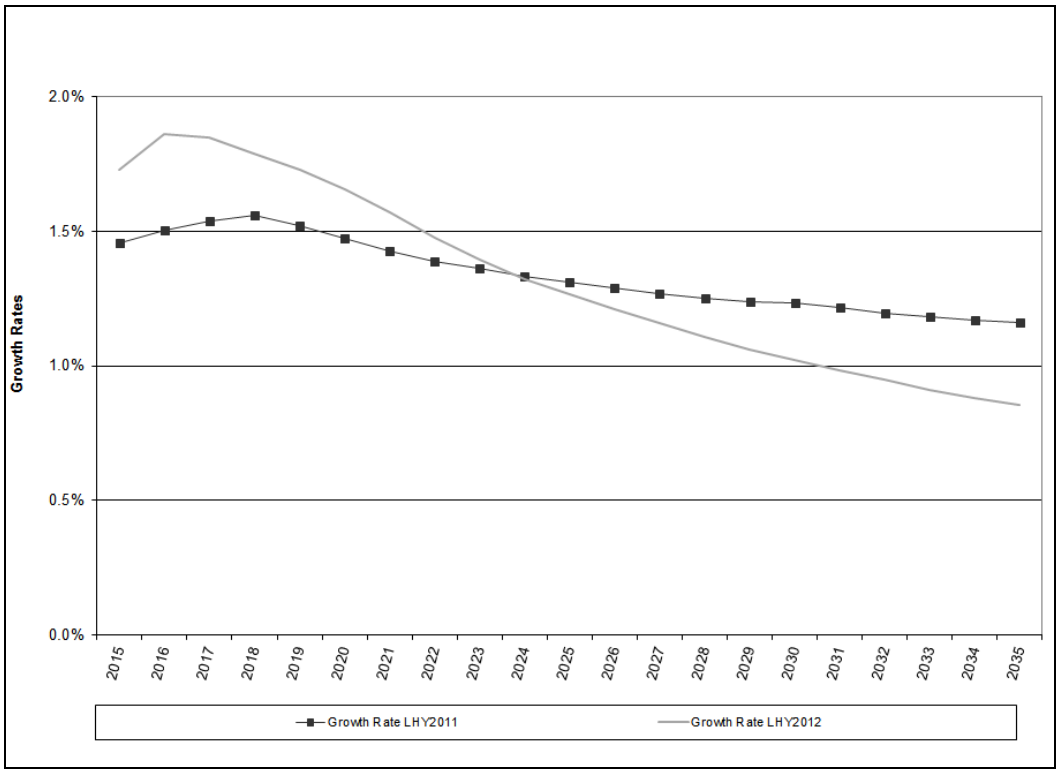
[3] The detailed out-of-the-box results through 2050 appear in Table A1 of the Appendix.

Figure 1: Clark County Population Forecasts: REMI Out-of-the-Box LHY2012 and LHY2011: 2015-2035



Note: Out-of-the-box refers to the model prior to recalibration. These numbers are not the final forecast.

Figure 2: Clark County Population-Growth-Rate Forecasts: REMI Out-of-the-Box LHY2012 and LHY2011: 2015-2035



Note: Out-of-the-box refers to the model prior to recalibration. These numbers are not the final forecast.

III. Recalibrating the Model

County-level personal income is only available with a two-year lag. As a result, the REMI model also has a two-year lag with the most recent historical data from 2012 for the current model, PI+ v1.6, released in 2014. To bring the model up to date, we update available pertinent model information, including the most recent national GDP forecast, more recent employment figures, and spending on capital projects to reflect local information in the forecast. We describe each update in turn.

In previous years, we made an adjustment to future hotel employment based on local expectations of hotel rooms that will be added in the near future. This ensures that the model includes a good short-term forecast of new hotel investment and employment. This year, the Las Vegas Convention and Visitors Authority (LVCVA) projects that 4,961 new hotel/motel rooms will be added to the local room stock by the end of 2017. Assuming a jobs-to-room multiplier of 1.6, this would imply roughly 7,938 new jobs for the accommodation sector. However, the REMI model's baseline employment forecast for the accommodation industry already predicts 10,787 additional jobs by the end of 2017. As a result, we did not make an additional adjustment for new hotel rooms. The current forecast relies on the REMI model's growth forecast for the accommodation sector in the near term. The REMI model's baseline employment growth forecast for the accommodation industry is roughly 3 percent in the years 2015 and 2016.

In previous forecasts we also made an adjustment for disamenities related to population growth. This adjustment was appropriate during the years prior to the 2008 economic recession, as the Las Vegas metropolitan area was one of the fastest-growing communities in the United States. However, population growth rates have been lower in Clark County after the economic recession. As a result of this slower population growth,

we do not find it necessary to make an adjustment for disamenities related to population growth.

A. Adjustment of the national GDP forecast

The REMI model relies on a baseline national GDP forecast from the University of Michigan's Research Seminar in Quantitative Economics. The current REMI model, PI+ v1.6, utilizes the March 2014 GDP forecast from RSQE. We adjust the model's national GDP forecast using the March 2015 national GDP forecast from RSQE. Overall, we adjusted the national GDP components downward by about $105 billion in 2015 and $137 billion in 2016. The adjusted national forecast is used to generate a new baseline forecast for Clark County. The baseline forecast is then used for the subsequent adjustments.

B. Employment adjustment

One of the most noteworthy updates we make to the REMI model is the employment adjustment. The industry-level employment data used by REMI are the sum of the BLS wage and salary estimates for Clark County and REMI's BLS-based estimate of the number of proprietors. The most recent historical year in the model's employment data is 2012. However, more recent wage and salary employment data are available from the Nevada DETR for 2013 and 2014. Thus, we update the model to account for the more recent information.

The latest growth rates for the out-of-the-box REMI-model forecasts and recent DETR estimates are shown in Table 2 for 2013 and 2014. The actual growth rates from DETR differ noticeably from the REMI out-of-the-box forecasts, suggesting a clear need for adjustments. The employment update is as follows: We calculate the annual percentage change using DETR data and apply the percentage changes to generate new

estimates for 2013 and 2014. The underlying assumption of this procedure is that the proportion of self-employed in each industry classification grows at the same rate as does the ratio between full- and part-time workers.

Table 2: Employment Growth Rates for Clark County before Adjustment				
	REMI Baseline Forecast		DETR Estimates	
Industrial Classification	**2013**	**2014**	**2013**	**2014**
Construction	6.56%	5.11%	9.09%	10.78%
Air transportation	-1.17%	-1.06%	1.49%	2.45%
Rail transportation	0.54%	0.00%	2.56%	12.29%
Pipeline transportation	0.00%	0.00%	0.75%	7.46%
Monetary authorities, et al.	1.04%	1.50%	2.19%	-2.86%
Ins carriers, related activities	1.31%	2.63%	4.26%	-2.86%
Real estate	1.46%	2.21%	4.40%	5.79%
Professional, technical services	1.85%	2.05%	4.50%	10.06%
Management of companies	0.95%	0.90%	1.94%	5.06%
Administrative, support services	2.06%	2.62%	5.39%	2.56%
Ambulatory health care services	3.16%	4.78%	3.13%	5.17%
Hospitals	3.49%	4.74%	1.23%	5.49%
Amusement, gambling, and recreation	1.13%	2.70%	1.60%	4.72%
Accommodation	2.20%	3.22%	0.18%	-0.24%
Food services, drinking places	2.81%	3.78%	6.16%	1.30%
Total	1.79%	2.32%	2.88%	4.52%

Table 3 reports the updated employment data by category for the model. The Clark County job growth numbers in 2013 and 2014 suggest that general economic conditions are still improving in the Las Vegas area. While the Southern Nevada economy gained 2.1 percent of its total employment in 2012, the DETR estimates suggest that Clark County employment grew by about 2.9 percent and 4.5 percent in 2013 and 2014, respectively. Most sectors of Southern Nevada's economy experienced positive job growth in 2013. The construction sector experienced strong positive job growth in 2013 for the first time since the beginning of the economic recession. Strong employment gains

also occurred in key sectors such as health care, retail, and food services. Overall, Southern Nevada's economy gained roughly 26,000 jobs in 2013.

Table 3: Model Job Adjustments (in 000s) for 2013 and 2014

	Baseline	DETR Growth Rates		Adjusted Job Levels	
Industrial Classification	**History 2012**	**2013**	**2014**	**2013**	**2014**
Forestry et al.	0.25	1.61%	4.76%	0.25	0.26
Agriculture	0.14	4.32%	2.07%	0.15	0.15
Oil, gas extraction	0.03	3.70%	7.14%	0.03	0.03
Mining (except oil, gas)	1.51	3.24%	1.92%	1.56	1.59
Support activities for mining	0.07	1.49%	5.88%	0.07	0.07
Utilities	2.77	1.73%	2.09%	2.82	2.88
Construction	47.33	9.09%	10.78%	51.63	57.20
Wood product mfg	0.30	6.25%	4.64%	0.32	0.34
Nonmetallic mineral prod mfg	1.77	4.93%	3.94%	1.85	1.93
Primary metal mfg	0.87	5.77%	-0.65%	0.92	0.91
Fabricated metal prod mfg	2.12	2.69%	1.15%	2.18	2.20
Machinery mfg	0.53	-0.19%	-1.71%	0.53	0.52
Computer, electronic prod mfg	0.57	-2.97%	-2.52%	0.56	0.54
Electrical equip, appliance mfg	0.52	1.91%	-0.19%	0.53	0.53
Motor vehicle mfg	0.13	1.60%	0.00%	0.13	0.13
Transp equip mfg exc motor veh	0.06	1.59%	-1.56%	0.06	0.06
Furniture, related prod mfg	0.75	4.81%	3.31%	0.79	0.81
Miscellaneous mfg	6.25	3.79%	5.66%	6.49	6.86
Food mfg	2.97	1.82%	2.38%	3.02	3.09
Beverage, tobacco prod mfg	0.16	2.55%	3.73%	0.16	0.17
Textile mills; textile prod mills	0.28	5.99%	2.66%	0.30	0.31
Apparel mfg	0.22	-9.42%	-5.94%	0.20	0.19
Paper mfg	0.30	2.01%	1.97%	0.31	0.31
Printing, rel supp act	2.35	0.30%	0.47%	2.36	2.37
Petroleum, coal prod mfg	0.04	0.00%	2.50%	0.04	0.04
Chemical mfg	1.02	1.17%	0.68%	1.04	1.04
Plastics, rubber prod mfg	1.53	2.15%	1.08%	1.57	1.58
Wholesale trade	24.58	2.72%	1.80%	25.25	25.70
Retail trade	114.89	3.13%	2.12%	118.49	121.00
Air transportation	6.13	1.49%	2.45%	6.23	6.38
Rail transportation	0.19	2.56%	12.29%	0.19	0.21
Water transportation	0.21	0.48%	1.43%	0.21	0.21
Truck transportation	4.55	2.29%	1.61%	4.65	4.73

Table 3 Continued:	Baseline	DETR Growth Rates		Adjusted Job Levels	
Industrial Classification	**History 2012**	**2013**	**2014**	**2013**	**2014**
Couriers and messengers	3.30	-0.55%	-0.85%	3.28	3.26
Transit, ground pass transp	14.50	-0.76%	0.55%	14.39	14.47
Pipeline transportation	0.02	0.75%	7.46%	0.02	0.02
Scenic, sightseeing transp; supp	5.55	-0.07%	-1.33%	5.55	5.48
Warehousing, storage	5.07	3.17%	2.62%	5.23	5.37
Publishing, exc Internet	2.35	-0.55%	-0.81%	2.33	2.31
Motion picture, sound rec	3.37	0.92%	-1.15%	3.41	3.37
Internet serv, data proc, other	1.79	0.56%	0.67%	1.80	1.81
Broadcasting, exc Int;	1.64	1.28%	1.93%	1.66	1.69
Telecommunications	4.58	0.24%	0.70%	4.59	4.62
Monetary authorities, et al.	20.24	2.19%	-2.86%	20.68	20.09
Sec, comm contracts, inv	30.94	1.70%	2.58%	31.46	32.28
Ins carriers, rel act	12.20	4.26%	-2.86%	12.72	12.36
Real estate	70.93	4.40%	5.79%	74.05	78.34
Rental, leasing services	6.36	2.04%	2.11%	6.49	6.63
Prof, tech services	56.72	4.50%	10.06%	59.27	65.24
Mgmt of companies, enterprises	16.78	1.94%	5.06%	17.10	17.97
Administrative, support services	77.08	5.39%	2.56%	81.24	83.31
Waste mgmt, remed services	2.10	1.14%	1.93%	2.13	2.17
Educational services	9.95	0.45%	1.92%	9.99	10.18
Ambulatory health care services	37.31	3.13%	5.17%	38.48	40.47
Hospitals	19.08	1.23%	5.49%	19.32	20.38
Nursing, residential care facilities	7.69	1.61%	2.60%	7.81	8.01
Social assistance	17.23	0.94%	1.96%	17.39	17.74
Performing arts, spectator sports	20.44	0.13%	1.09%	20.47	20.69
Museums et al.	0.13	-1.56%	0.00%	0.13	0.13
Amusement, gambling, recreation	14.56	1.60%	4.72%	14.79	15.49
Accommodation	179.95	0.18%	-0.24%	180.28	179.84
Food services, drinking places	69.19	6.16%	1.30%	73.45	74.41
Repair, maintenance	9.73	-1.11%	-0.14%	9.62	9.61
Personal, laundry services	26.74	-1.63%	-0.06%	26.30	26.29
Membership assoc, organ	8.60	-0.50%	0.42%	8.55	8.59
Private households	5.98	0.87%	4.20%	6.03	6.28
State & local government	81.85	0.41%	1.03%	82.19	83.03
Federal civilian	12.31	-2.62%	-2.24%	11.99	11.72
Federal military	15.46	-7.62%	-4.55%	14.28	13.63
Farm	0.23	-0.44%	-2.19%	0.23	0.22
Total	1,097.33	2.88%	4.52%	1,123.57	1,151.82

The local economic recovery continued in 2014 with stronger employment growth. Strong positive job growth took place in 2014 in key sectors such as construction, real

estate, professional services, and gaming. Overall, Southern Nevada's economy gained roughly 28,000 jobs in 2014.

C. Transportation and infrastructure improvements

Clark County has continued to invest in transportation infrastructure such as roads, highways, and mass transit. The model assumes that public-infrastructure investment will continue at a pace consistent with the model history. Thus, some local spending on public infrastructure, such as road building and additional services, is built into the model. However, one-time monies tend to come from outside the region (for example, federal transportation funding). These large, special projects need to be accounted for in the forecast.

The estimated federal funding in transportation-infrastructure investment is about $210 million in 2015, $1.81 billion between 2016 and 2025, and $1.47 billion between 2026 and 2035.[4] These expenditures are annualized and included in the REMI model as new construction projects.

D. Rebasing the population forecast

We rebase the population forecasts using the population update feature in the REMI model. We update the population in 2014 based on the most recent information available for use from the SNRPC. The SNRPC consensus population estimate for Clark County in 2014 is 2.1 million. In addition, we update the population levels in 2015 and 2016 to reflect the population growth rate forecast from CBER's *2015 Economic Outlook*, which was published in December 2014. The latter adjustment is intended to incorporate the views of local economic experts at CBER in the short-term population forecasts. CBER predicts that the Clark County population will grow by 2.1 percent in 2015 and 2016.

[4] Source: Regional Transportation Commission, March 2015.

These population growth-rate forecasts translate to a forecasted population of 2.15 million in 2015 and 2.19 million in 2016. We use these forecasted population levels to update the population in the REMI model.

IV. Analysis of the Economic and Demographic Forecast

The forecast predicts moderate rates of population growth for Southern Nevada over the forecast period extending out to 2050. The rate of growth, which has been decidedly greater than the national average over the past fifty years, is beginning to moderate and move toward the national rate of growth. The economic forecast calls for the continuation of the economic recovery in 2015 and steady employment growth through 2018. Tables 4 through 6, respectively, report the population, employment, and Gross Regional Product (GRP) predictions for Clark County from the calibrated model.

A. Population

In the short term, the current forecast predicts moderate rates of population growth in Southern Nevada. The population in Clark County is predicted to grow at a rate of 2.1 percent in 2015 and 2016 (Table 4). The population growth rate declines in the medium term as the Clark County economy moves closer to maturity. By 2030, the population growth rate falls to 1.1 percent as the Clark County economy is expected to mature; and it reaches 0.7 percent, slightly above the projected[5] long-term national population growth rate of 0.5 percent, by 2050. This pattern of long-term growth is expected as our economy matures and is very similar to previous forecasts.

Clark County is forecasted to add roughly 44,000 new residents in 2015. CBER's 2015 Southern Nevada Economic Outlook predicts that population growth will strengthen with employment in the near term, and it will not be a driver of economic growth as it

[5] Source: http://www.census.gov/population/projections/data/national/2014.html

was throughout much of Las Vegas' history. Rather, economic growth will drive population in the next few years. The population forecast predicts that the Clark County population will be roughly 3.11 million by 2050.

Table 4: Population History, REMI Forecast, and Rebased Forecast[6]

Year	Population REMI Forecast*	Population Rebased Forecast	Change in Population Rebased Forecast	Growth in Population Rebased Forecast
2014	2,060,000	2,102,238**		
2015	2,096,000	2,146,000***	43,762	2.1%
2016	2,135,000	2,191,000***	45,000	2.1%
2017	2,175,000	2,225,000	34,000	1.6%
2018	2,214,000	2,262,000	37,000	1.7%
2019	2,252,000	2,299,000	37,000	1.6%
2020	2,289,000	2,335,000	36,000	1.6%
2021	2,325,000	2,371,000	36,000	1.5%
2022	2,359,000	2,407,000	36,000	1.5%
2023	2,392,000	2,441,000	34,000	1.4%
2024	2,424,000	2,475,000	34,000	1.4%
2025	2,455,000	2,507,000	32,000	1.3%
2026	2,484,000	2,538,000	31,000	1.2%
2027	2,513,000	2,568,000	30,000	1.2%
2028	2,541,000	2,598,000	30,000	1.2%
2029	2,568,000	2,626,000	28,000	1.1%
2030	2,594,000	2,654,000	28,000	1.1%
2031	2,619,000	2,679,000	25,000	0.9%
2032	2,644,000	2,704,000	25,000	0.9%
2033	2,668,000	2,729,000	25,000	0.9%
2034	2,692,000	2,753,000	24,000	0.9%
2035	2,715,000	2,776,000	23,000	0.8%
2040	2,825,000	2,887,000	22,000	0.8%
2045	2,933,000	2,996,000	22,000	0.7%
2050	3,046,000	3,109,000	23,000	0.7%

* This forecast refers to the model prior to recalibration.
** Southern Nevada concensus population estimate.
*** CBER 2015 Economic Outlook forecast, December 2014.

[6] A table detailing the rebased population forecast appears in the Appendix – Table A2.

B. Employment

The forecast predicts a steady economic recovery for Southern Nevada in 2015. The Las Vegas economy is forecasted to add an additional 27,000 jobs in 2015, which represents a 2.3 percent growth in employment over 2014. See Table 5.[7] Employment growth is predicted to remain strong in 2016 as the economy is predicted to add 36,000 new jobs. The forecast also predicts a continuation of steady employment growth in the near term. It is predicted that the Las Vegas economy will exceed the 2007 peak employment level (1.18 million jobs) in 2016. Employment growth reaches a peak of 3.1 percent in 2016 and then eventually stabilizes at around 0.5 percent as the Southern Nevada economy reaches maturity.

[7] Unadjusted employment forecasts are shown in the Appendix.

Table 5: Employment History and Forecasts				
Year	Employment Forecast	Change in Employment Forecast	Growth in Employment Forecast	Employment-Population Ratio Forecast
2012	1,097,000*			0.55
2013	1,124,000	27,000	2.4%	0.54
2014	1,152,000	28,000	2.5%	0.55
2015	1,179,000	27,000	2.3%	0.55
2016	1,215,000	36,000	3.1%	0.55
2017	1,252,000	37,000	3.0%	0.56
2018	1,280,000	28,000	2.3%	0.57
2019	1,299,000	19,000	1.5%	0.57
2020	1,316,000	17,000	1.3%	0.56
2021	1,330,000	14,000	1.0%	0.56
2022	1,341,000	11,000	0.9%	0.56
2023	1,350,000	9,000	0.6%	0.55
2024	1,356,000	6,000	0.5%	0.55
2025	1,362,000	6,000	0.4%	0.54
2026	1,367,000	5,000	0.4%	0.54
2027	1,372,000	5,000	0.3%	0.53
2028	1,376,000	4,000	0.3%	0.53
2029	1,380,000	4,000	0.3%	0.53
2030	1,384,000	4,000	0.3%	0.52
2031	1,388,000	4,000	0.3%	0.52
2032	1,396,000	8,000	0.6%	0.52
2033	1,404,000	8,000	0.6%	0.51
2034	1,412,000	8,000	0.6%	0.51
2035	1,419,000	7,000	0.5%	0.51
2040	1,457,000	8,000	0.5%	0.50
2045	1,500,000	8,000	0.6%	0.50
2050	1,542,000	8,000	0.5%	0.50
* Actual employment.				

C. Gross regional product

Gross Regional Product (GRP) is defined as the dollar value of all final goods and services for sale in a regional economy. As such, it reflects the output of a local economy and avoids double-counting initial and intermediate goods. The forecast for growth in the Clark County GRP, shown in Table 6, basically mirrors the growth pattern of local

employment. The GRP growth forecast starts at 3.6 percent in 2015, and climbs up to 4.6 percent in 2017. The GRP growth forecast finally stabilizes at around 1.5 percent as the Southern Nevada economy reaches maturity.

Table 6: Gross Regional Product History and Forecasts

Year	GRP (Billions of Chained 2015$) REMI Forecast	Change in GRP (Billions of Chained 2015$) REMI Forecast	Growth in GRP (Billions of Chained 2015$) REMI Forecast	GRP per Capita (Chained 2015$) REMI Forecast
2012	103.08*			51,518
2013	106.28	3.20	3.1%	51,534
2014	110.51	4.24	4.0%	52,569
2015	114.51	4.00	3.6%	53,351
2016	119.76	5.25	4.6%	54,648
2017	125.29	5.53	4.6%	56,303
2018	130.16	4.87	3.9%	57,549
2019	134.2	4.04	3.1%	58,386
2020	138.08	3.88	2.9%	59,124
2021	141.71	3.63	2.6%	59,754
2022	145.22	3.51	2.5%	60,335
2023	148.52	3.30	2.3%	60,834
2024	151.63	3.11	2.1%	61,273
2025	154.64	3.01	2.0%	61,686
2026	157.76	3.13	2.0%	62,156
2027	160.84	3.07	1.9%	62,620
2028	163.89	3.05	1.9%	63,091
2029	167.08	3.18	1.9%	63,623
2030	170.25	3.18	1.9%	64,161
2031	172.37	2.12	1.2%	64,336
2032	175.08	2.71	1.6%	64,740
2033	177.8	2.72	1.6%	65,155
2034	180.55	2.76	1.6%	65,592
2035	183.31	2.76	1.5%	66,033
2040	197.75	2.88	1.5%	68,495
2045	213.54	3.26	1.6%	71,267
2050	230.4	3.45	1.5%	74,112

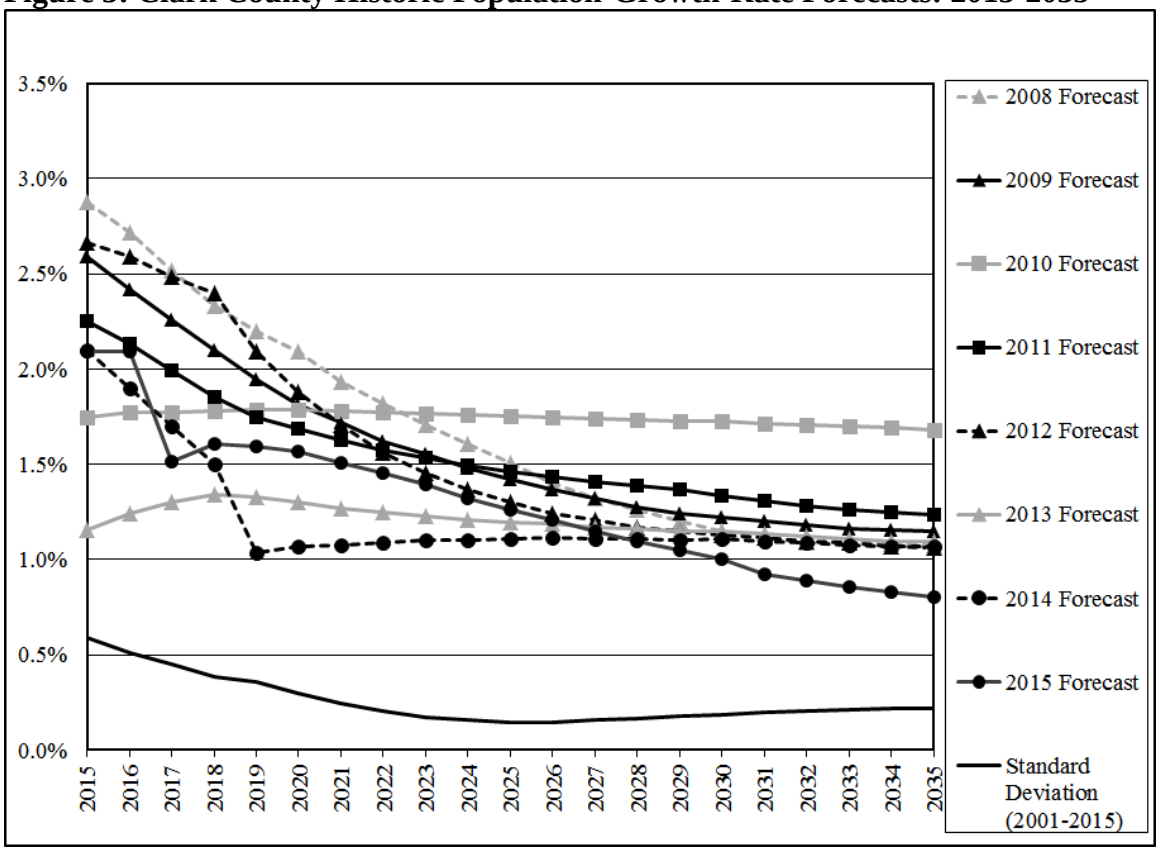
* Actual GRP.

V. Comparing Current Forecast with Previous Years of the Forecast

This section compares this year's final population growth forecasts with the final population growth forecasts from previous years. This exercise allows us to assess the consistency of the forecast methodology and to assess the variability in the population growth forecasts over the last eight years. Figure 3 shows the population-growth-rate forecasts obtained from 2008 to 2015. Figure 3 also shows the standard deviation of the population-growth-rate forecast in the last 15 years (2001-2015).[8] The population-growth-rate forecasts exhibit a high level of variability in the near term. The standard deviation of the population-growth-rate forecast for the year 2015 is roughly 0.6 percent. This reflects a high degree of uncertainty in the short-term forecast (see Section VI). The variability among the population-growth-rate forecasts falls dramatically in the long term. By 2030, the forecasted growth rates converge to about 1.3 percent, with a standard deviation of 0.2 percent. Hence, there is a large degree of consistency in the long-term growth predictions obtained during the last 15 years, as evidenced by the low standard deviation among the forecasts. This observation further confirms the fact that our forecasts are primarily meant to be long-run planning tools.

[8] The standard deviation is a measure of the variability among data points. For data that follow a normal distribution, 99.7 percent of data points will fall within approximately 3 standard deviations of the mean.

Figure 3: Clark County Historic Population-Growth-Rate Forecasts: 2015-2035



VI. Risks to the Forecast

Our Southern Nevada population forecasts rest on economic and demographic models set in the context of a structured framework. This structure keeps our long-term forecasts consistent with our objectives. We have separated the long-term trend from the noise that one finds in time-series data. These noise factors include the business cycle and seasonal and irregular events.

The main risks to the population forecasts arise from short-term fluctuations in both U.S. and Southern Nevada economic conditions. Based on our assessment of the national and regional trends, we believe that the Southern Nevada economy will continue to see improvements in 2015 and 2016. This outlook for the Southern Nevada economy is based on the idea that improving economic conditions in the United States, particularly in

the West, will benefit the Southern Nevada economy. As the growth of the U.S. economy accelerates, the Southern Nevada economy will further strengthen. This would result in higher population growth rates than those we are seeing in the current forecast. The Southern Nevada economy could see slower growth if the U.S. economy proves weaker than we have predicted. This would result in lower population growth rates than those we are seeing in the current forecast.

Therefore, although we feel the population forecasts are sound, there are significant risks to the forecasts that could lead to either over- or underestimated growth. We say again, however, that these risks tend to arise from short-term uncertainty; whereas, our forecasts are primarily meant to be long-term planning tools.

VII. Conclusion

The latest REMI model projects long-term population growth patterns that are consistent with previous population forecasts. In the short term, the population forecast mirrors last year's forecast. In the medium term, the population forecast is higher than last year's forecast. By 2043 the population forecast falls below last year's forecast. These patterns are a reflection of the new data incorporated into the model that take into account the recent economic recovery. We note that, despite short-term economic uncertainties and model difficulties, the long-term population forecast, which is the main focus of this forecasting exercise, remains consistent with past forecasts. By 2035, we predict that Clark County's population will be about 2.78 million. In 2050, Clark County is expected to have nearly 3.11 million residents.

Appendix:

Detailed Report Tables

Table A1: Out-of-the-Box Clark County Population and Population Growth Forecasts from REMI Models LHY2012 and LHY2011

Year	LHY2012 Population (Thousands)	LHY2011 Population (Thousands)	LHY2012 Population Growth	LHY2011 Population Growth
2015	2,096	2,076		
2016	2,135	2,108	1.9%	1.5%
2017	2,175	2,140	1.8%	1.5%
2018	2,214	2,173	1.8%	1.6%
2019	2,252	2,206	1.7%	1.5%
2020	2,289	2,239	1.7%	1.5%
2021	2,325	2,271	1.6%	1.4%
2022	2,359	2,302	1.5%	1.4%
2023	2,392	2,334	1.4%	1.4%
2024	2,424	2,365	1.3%	1.3%
2025	2,455	2,396	1.3%	1.3%
2026	2,484	2,427	1.2%	1.3%
2027	2,513	2,458	1.2%	1.3%
2028	2,541	2,488	1.1%	1.3%
2029	2,568	2,519	1.1%	1.2%
2030	2,594	2,550	1.0%	1.2%
2031	2,619	2,581	1.0%	1.2%
2032	2,644	2,612	0.9%	1.2%
2033	2,668	2,643	0.9%	1.2%
2034	2,692	2,674	0.9%	1.2%
2035	2,715	2,705	0.9%	1.2%
2040	2,825	2,862	0.8%	1.1%
2045	2,933	3,027	0.8%	1.1%
2050	3,046	3,198	0.7%	1.1%

Note: Out-of-the-box refers to the model prior to recalibration. These numbers are not the final forecast.

Table A2: Detailed Final Population Forecast: 2000 – 2050			
Year	**Population Forecast**	**Change in Population Forecast**	**Growth in Population (Percent)**
2000	1,428,689*		
2001	1,498,278*	69,589	4.9%
2002	1,578,332*	80,054	5.3%
2003	1,641,529*	63,197	4.0%
2004	1,747,025*	105,496	6.4%
2005	1,815,700*	68,675	3.9%
2006	1,912,654*	96,954	5.3%
2007	1,996,542*	83,888	4.4%
2008	1,986,145*	-10,397	-0.5%
2009	2,006,347*	20,202	1.0%
2010	1,951,269**	-55,078	-2.7%
2011	1,966,630*	15,361	0.8%
2012	2,008,654*	42,024	2.1%
2013	2,062,253	53,599	2.7%
2014	2,102,238*	39,985	2.0%
2015	2,146,000***	43,762	2.1%
2016	2,191,000***	45,000	2.1%
2017	2,225,000	34,000	1.6%
2018	2,262,000	37,000	1.7%
2019	2,299,000	37,000	1.6%
2020	2,335,000	36,000	1.6%
2021	2,371,000	36,000	1.5%
2022	2,407,000	36,000	1.5%
2023	2,441,000	34,000	1.4%
2024	2,475,000	34,000	1.4%
2025	2,507,000	32,000	1.3%
2026	2,538,000	31,000	1.2%
2027	2,568,000	30,000	1.2%
2028	2,598,000	30,000	1.2%
2029	2,626,000	28,000	1.1%
2030	2,654,000	28,000	1.1%
2031	2,679,000	25,000	0.9%
2032	2,704,000	25,000	0.9%
2033	2,729,000	25,000	0.9%
2034	2,753,000	24,000	0.9%
2035	2,776,000	23,000	0.8%
2036	2,799,000	23,000	0.8%
2037	2,821,000	22,000	0.8%
2038	2,843,000	22,000	0.8%
2039	2,865,000	22,000	0.8%
2040	2,887,000	22,000	0.8%
2041	2,909,000	22,000	0.8%
2042	2,930,000	21,000	0.7%
2043	2,952,000	22,000	0.8%
2044	2,974,000	22,000	0.7%
2045	2,996,000	22,000	0.7%
2046	3,019,000	23,000	0.8%
2047	3,041,000	22,000	0.7%
2048	3,063,000	22,000	0.7%
2049	3,086,000	23,000	0.8%
2050	3,109,000	23,000	0.7%

* SNRPC consensus population estimate.
** 2010 U.S. Census.
*** CBER 2015 Economic Outlook forecast, December 2014.
Note: The average annual forecasted growth rate is 1.1 percent.

Table A3: Economic Forecast										
Variable	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Total Employment (in 000s)	1178.85	1214.91	1251.60	1280.21	1299.45	1316.14	1329.60	1341.27	1349.74	1356.41
Total Employment as % of Nation	0.63	0.64	0.65	0.66	0.67	0.68	0.68	0.68	0.68	0.68
Private Non-Farm Employment (000s)	1070.28	1105.24	1139.96	1167.26	1186.00	1202.40	1215.77	1227.45	1236.11	1242.98
Private Non-Farm Employment as % of Nation	0.67	0.68	0.69	0.70	0.71	0.71	0.72	0.72	0.72	0.72
Gross Domestic Product (billions of fixed 2015 $)	114.51	119.76	125.29	130.16	134.20	138.08	141.71	145.22	148.52	151.63
Personal Income (billions of fixed 2015 $)	0.62	0.63	0.64	0.65	0.66	0.66	0.66	0.67	0.67	0.67
Personal Income as % of Nation	180.66	188.84	197.41	204.85	210.87	216.54	221.71	226.60	231.41	236.10
Disposable Personal Income (billions of fixed 2015 $)	114.14	119.35	124.85	129.68	133.69	137.54	141.14	144.63	147.89	150.98
PCE-Price Index (2009=100)	83.35	85.74	87.94	89.52	90.56	91.53	92.20	92.83	93.23	93.44
Real Disposable Personal Income (billions of fixed 2015 $)	0.56	0.57	0.58	0.58	0.59	0.59	0.60	0.60	0.60	0.60
Real Disposable Personal Income as % of Nation	76.07	78.26	80.25	81.69	82.64	83.52	84.14	84.72	85.09	85.29
Population (in 000s)	0.57	0.58	0.59	0.60	0.60	0.61	0.61	0.62	0.62	0.62
Population as % of Nation	108.72	110.57	112.69	114.94	117.38	119.71	122.23	124.63	127.14	129.75

Table A3: Economic Forecast continued										
Variable	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2035**	**2040**	**2045**	**2050**
Total Employment (in 000s)	1361.80	1367.05	1371.60	1375.94	1380.33	1384.19	1419.36	1456.99	1500.16	1542.09
Total Employment as % of Nation	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.68	0.68	0.68
Private Non-Farm Employment (000s)	1248.67	1254.21	1259.07	1263.73	1268.44	1272.62	1310.71	1351.18	1396.78	1440.72
Private Non-Farm Employment as % of Nation	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.71	0.71	0.71
Gross Domestic Product (billions of fixed 2015 $)	154.64	157.76	160.84	163.89	167.08	170.25	183.31	197.75	213.54	230.40
Personal Income (billions of fixed 2015 $)	0.67	0.67	0.67	0.67	0.67	0.67	0.66	0.65	0.65	0.64
Personal Income as % of Nation	240.54	245.03	249.35	253.79	258.32	262.68	281.49	302.73	325.88	350.44
Disposable Personal Income (billions of fixed 2015 $)	153.96	157.06	160.11	163.13	166.29	169.44	182.40	196.73	212.40	229.13
PCE-Price Index (2009=100)	93.63	93.79	93.95	94.06	94.23	94.39	93.56	92.99	92.35	91.58
Real Disposable Personal Income (billions of fixed 2015 $)	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.62	0.63	0.63
Real Disposable Personal Income as % of Nation	85.47	85.63	85.79	85.90	86.07	86.22	85.54	85.08	84.57	83.92
Population (in 000s)	0.62	0.62	0.62	0.62	0.63	0.63	0.63	0.64	0.64	0.65
Population as % of Nation	132.34	135.03	137.70	140.48	143.25	146.12	161.39	178.22	196.98	217.56

Table A4: Employment (in 000s)										
Variable	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Private Non-Farm	1070.28	1105.24	1139.96	1167.27	1186.00	1202.40	1215.78	1227.45	1236.11	1242.98
Forestry, Fishing, Other	0.43	0.44	0.44	0.45	0.45	0.45	0.46	0.46	0.47	0.47
Mining	1.73	1.80	1.87	1.93	1.96	1.99	2.00	2.02	2.01	2.03
Utilities	2.94	3.00	3.05	3.08	3.08	3.07	3.06	3.04	3.00	2.97
Construction	60.12	67.13	73.60	79.43	84.28	88.42	91.71	94.17	95.65	97.03
Manufacturing	24.55	24.86	24.88	24.82	24.67	24.57	24.48	24.43	24.39	24.26
Wholesale Trade	26.17	26.85	27.57	28.09	28.39	28.61	28.75	28.82	28.80	28.74
Retail Trade	123.56	126.96	130.97	134.08	136.08	137.76	138.95	139.80	140.14	140.34
Transportation and Warehousing	40.25	40.64	41.00	41.15	41.09	41.03	40.96	40.92	40.87	40.72
Information	13.82	13.93	14.10	14.16	14.12	14.04	13.92	13.77	13.59	13.38
Finance and Insurance	66.18	67.85	69.50	70.58	71.07	71.38	71.48	71.48	71.30	71.05
Real Estate and Rental and Leasing	86.84	89.46	91.92	93.82	95.11	96.28	97.29	98.24	99.02	99.66
Professional and Technical Services	66.58	68.63	70.76	72.51	73.80	75.04	76.17	77.28	78.31	79.28
Mngmt of Companies and Enterprises	18.13	18.38	18.62	18.73	18.70	18.64	18.53	18.41	18.25	18.09
Admin and Waste Services	87.70	90.42	93.19	95.34	96.85	98.20	99.35	100.43	101.33	102.11
Educational Services	10.38	10.58	10.75	10.89	10.98	11.08	11.19	11.32	11.48	11.61
Health Care and Social Assistance	90.05	93.49	97.07	100.16	102.64	105.12	107.52	109.96	112.37	114.54
Arts, Entertainment, and Recreation	36.96	37.64	38.29	38.71	38.91	39.08	39.23	39.39	39.53	39.58
Accommodation and Food Services	262.87	271.86	280.82	287.72	292.42	296.39	299.61	302.43	304.54	306.21
Other Services, except Govt	51.03	51.34	51.58	51.62	51.41	51.27	51.14	51.09	51.06	50.92
Government	108.35	109.46	111.43	112.74	113.25	113.55	113.63	113.63	113.45	113.25
State and Local	83.88	85.46	87.58	89.16	90.05	90.74	91.22	91.58	91.75	91.90
Federal Civilian	11.46	11.37	11.33	11.22	11.01	10.79	10.54	10.28	10.01	9.76
Federal Military	13.01	12.63	12.52	12.37	12.18	12.02	11.88	11.77	11.69	11.59
Farm	0.22	0.21	0.21	0.21	0.20	0.20	0.19	0.19	0.18	0.18

Table A4: Employment (in 000s) continued										
Variable	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2035**	**2040**	**2045**	**2050**
Private Non-Farm	1248.67	1254.21	1259.07	1263.74	1268.44	1272.62	1310.71	1351.18	1396.78	1440.72
Forestry, Fishing, Other	0.47	0.47	0.47	0.47	0.47	0.46	0.45	0.44	0.42	0.41
Mining	2.05	2.07	2.09	2.11	2.13	2.15	2.28	2.43	2.58	2.73
Utilities	2.93	2.90	2.86	2.82	2.78	2.74	2.55	2.38	2.23	2.09
Construction	98.37	99.78	101.24	102.79	104.50	106.28	118.21	130.53	142.95	154.21
Manufacturing	24.08	23.89	23.68	23.45	23.24	23.00	22.20	21.71	21.45	21.17
Wholesale Trade	28.67	28.60	28.53	28.45	28.38	28.30	28.31	28.29	28.29	28.18
Retail Trade	140.49	140.61	140.63	140.56	140.51	140.37	141.21	141.98	142.94	143.41
Transportation and Warehousing	40.59	40.49	40.39	40.32	40.29	40.26	41.06	42.15	43.55	45.09
Information	13.19	13.01	12.87	12.76	12.67	12.58	12.32	12.08	11.93	11.80
Finance and Insurance	70.78	70.50	70.20	69.88	69.60	69.29	68.75	68.24	67.94	67.52
Real Estate and Rental and Leasing	100.16	100.65	101.06	101.43	101.78	102.07	104.70	107.32	110.37	113.27
Professional and Technical Services	80.22	81.16	82.08	83.00	83.96	84.89	90.92	97.33	104.40	111.59
Mngmt of Companies and Enterprises	17.92	17.75	17.56	17.36	17.17	16.97	16.18	15.38	14.62	13.84
Admin and Waste Services	102.80	103.47	104.05	104.62	105.16	105.66	109.46	113.39	117.79	122.06
Educational Services	11.71	11.81	11.89	11.97	12.04	12.08	12.44	12.72	12.96	13.11
Health Care and Social Assistance	116.45	118.33	120.15	122.04	123.87	125.74	137.38	150.60	165.51	181.66
Arts, Entertainment, and Recreation	39.60	39.62	39.62	39.62	39.63	39.61	40.02	40.51	41.25	42.11
Accommodation and Food Services	307.44	308.51	309.26	309.80	310.16	310.18	312.19	313.51	315.17	315.92
Other Services, except Govt	50.75	50.59	50.44	50.28	50.13	49.99	50.08	50.20	50.43	50.54
Government	112.96	112.67	112.37	112.04	111.73	111.41	108.52	105.69	103.28	101.29
State and Local	91.97	92.00	92.00	91.94	91.88	91.79	90.10	88.28	86.71	85.41
Federal Civilian	9.51	9.28	9.07	8.88	8.70	8.54	7.93	7.51	7.20	6.98
Federal Military	11.49	11.39	11.30	11.22	11.15	11.07	10.49	9.90	9.37	8.90
Farm	0.18	0.17	0.17	0.16	0.16	0.16	0.14	0.12	0.10	0.09

Table A5: Gross Regional Product (Billions of fixed 2015 $)*										
Variable	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Personal Consumption Expenditures	86.997	91.153	95.411	99.141	102.157	105.055	107.714	110.261	112.708	115.014
Motor vehicles and parts	3.582	3.76	3.958	4.142	4.277	4.416	4.543	4.675	4.776	4.885
Furnishings and durable household equipment	2.662	2.861	3.075	3.265	3.419	3.561	3.683	3.791	3.89	3.981
Recreational goods and other durable goods	4.902	5.446	6.033	6.578	7.03	7.433	7.761	8.017	8.271	8.506
Food and beverages	6.426	6.682	6.919	7.112	7.259	7.396	7.516	7.619	7.717	7.806
Clothing and footwear	2.484	2.592	2.703	2.799	2.883	2.972	3.056	3.142	3.219	3.311
Motor vehicle fuels, lubricants, and fluids	2.583	2.644	2.732	2.816	2.877	2.942	3.016	3.097	3.179	3.228
Fuel oil and other fuels	0.079	0.087	0.096	0.104	0.111	0.116	0.121	0.124	0.127	0.13
Other nondurable goods	6.416	6.711	7.027	7.302	7.533	7.773	8.001	8.239	8.472	8.7
Housing	15.053	15.595	16.093	16.509	16.84	17.171	17.495	17.831	18.149	18.439
Household utilities	1.871	1.963	2.052	2.126	2.194	2.254	2.311	2.364	2.406	2.451
Transportation services	2.7	2.819	2.934	3.033	3.112	3.178	3.227	3.26	3.294	3.316
Health care	14.529	15.344	16.199	16.975	17.639	18.29	18.912	19.526	20.151	20.77
Recreation and other services	23.711	24.65	25.59	26.38	26.984	27.553	28.072	28.576	29.057	29.489
Gross Private Domestic Fixed Investment	17.513	19.327	21.141	22.926	24.575	26.148	27.679	29.053	30.332	31.576
Residential	4.319	5.148	5.965	6.771	7.499	8.164	8.794	9.289	9.699	10.087
Nonresidential structures	2.861	3.228	3.596	3.947	4.258	4.509	4.719	4.863	4.949	5.027
Nonresidential equipment	10.333	10.951	11.58	12.208	12.819	13.474	14.165	14.9	15.684	16.462
Change in Private Inventories	0.145	0.167	0.188	0.206	0.221	0.234	0.243	0.248	0.246	0.242
Exogenous Final Demand	0.193	0.189	0.218	0.214	0.21	0.206	0.103	0.101	0.099	0.098
Government Consumption Expenditures	16.487	16.878	17.24	17.509	17.683	17.853	18.05	18.221	18.323	18.387
Federal Military	5.461	5.433	5.418	5.368	5.329	5.302	5.275	5.286	5.304	5.304
Federal Civilian	2.094	2.122	2.13	2.123	2.103	2.08	2.055	2.025	1.995	1.962
State and Local Government	8.932	9.323	9.691	10.018	10.251	10.471	10.72	10.911	11.025	11.121
Total Exports	63.588	66.114	68.867	71.166	72.969	74.643	76.227	77.735	79.494	81.138
Total Imports	71.206	75.039	78.923	82.321	85.09	87.677	90.042	92.222	94.595	96.827

* Note: The sum of the components may not add up to the total GRP due to rounding.

Table A5: Gross Regional Product (Billions of fixed 2015 $) continued*										
Variable	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2035**	**2040**	**2045**	**2050**
Personal Consumption Expenditures	117.217	119.503	121.721	123.92	126.258	128.573	138.116	148.808	160.657	173.551
Vehicle & parts	4.988	5.108	5.216	5.325	5.441	5.578	6.121	6.719	7.321	7.904
Computers & furniture	4.07	4.162	4.256	4.347	4.447	4.547	4.985	5.471	5.979	6.499
Other durables	8.735	8.983	9.225	9.477	9.751	10.03	11.38	12.988	14.82	16.839
Food & beverages	7.877	7.959	8.031	8.107	8.184	8.252	8.46	8.693	8.986	9.327
Clothing & shoes	3.395	3.48	3.556	3.633	3.711	3.781	4.095	4.44	4.805	5.211
Gasoline & oil	3.309	3.358	3.442	3.487	3.572	3.616	3.899	4.196	4.515	4.812
Fuel oil & coal	0.133	0.135	0.139	0.141	0.144	0.146	0.158	0.171	0.186	0.2
Other non-durables	8.918	9.156	9.383	9.614	9.863	10.115	11.218	12.476	13.846	15.323
Housing	18.705	18.977	19.236	19.483	19.739	19.986	20.819	21.677	22.628	23.662
Household operation	2.493	2.542	2.584	2.632	2.674	2.726	2.906	3.114	3.351	3.631
Transportation	3.336	3.358	3.377	3.394	3.414	3.433	3.471	3.532	3.621	3.739
Medical care	21.36	21.964	22.548	23.156	23.77	24.399	27.155	30.253	33.753	37.677
Other services	29.897	30.321	30.727	31.122	31.548	31.964	33.451	35.076	36.847	38.727
Gross Private Domestic Fixed Investment	32.812	34.097	35.38	36.723	38.115	39.569	46.616	54.612	63.196	72.166
Residential	10.47	10.858	11.274	11.703	12.165	12.649	15.169	18.126	21.21	24.245
Nonresidential structures	5.096	5.161	5.217	5.283	5.356	5.426	5.685	6.002	6.354	6.758
Nonresidential equipment	17.246	18.077	18.888	19.736	20.595	21.494	25.762	30.483	35.631	41.163
Change in Private Inventories	0.238	0.234	0.23	0.226	0.222	0.218	0.199	0.183	0.166	0.147
Exogenous Final Demand	0.096	0.12	0.118	0.116	0.114	0.111	0.086	0	0	0
Government Consumption Expenditures	18.4	18.441	18.464	18.486	18.492	18.51	18.376	18.31	18.334	18.464
Federal Military	5.268	5.262	5.242	5.225	5.191	5.165	4.991	4.835	4.718	4.624
Federal Civilian	1.93	1.901	1.871	1.843	1.816	1.793	1.666	1.58	1.526	1.505
State and Local Government	11.203	11.278	11.351	11.418	11.485	11.552	11.719	11.895	12.09	12.335
Total Exports	82.737	84.338	85.865	87.365	89.047	90.47	96.34	102.854	109.905	117.169
Total Imports	98.944	101.152	103.206	105.314	107.637	109.777	119.518	130.713	143.087	156.226

* Note: The sum of the components may not add up to the total GRP due to rounding.

Table A6: Income (Billions of fixed 2015 $)										
Variable	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Total earnings by place of work	59.485	61.132	62.917	64.289	65.098	65.815	66.26	66.656	66.847	66.89
Total wage and salary disbursements	42.714	43.899	45.191	46.191	46.787	47.318	47.653	47.955	48.103	48.141
Supplements to wages and salaries	10.579	10.872	11.192	11.437	11.584	11.721	11.813	11.902	11.955	11.984
Employer contributions for employee pension and insurance funds	7.261	7.462	7.682	7.85	7.951	8.045	8.108	8.169	8.206	8.225
Employer contributions for government social insurance	3.318	3.41	3.51	3.587	3.633	3.676	3.705	3.733	3.75	3.758
Proprietors' income with inventory valuation and capital consumption adjustments	6.095	6.271	6.445	6.569	6.627	6.673	6.685	6.689	6.669	6.637
Less: Contributions for government social insurance	5.885	6.048	6.224	6.359	6.438	6.511	6.558	6.602	6.626	6.635
Employee and self-employed contributions for government social insurance	2.567	2.638	2.714	2.772	2.805	2.835	2.853	2.869	2.876	2.877
Employer contributions for government social insurance	3.318	3.41	3.51	3.587	3.633	3.676	3.705	3.733	3.75	3.758
Plus: Adjustment for residence	-0.615	-0.646	-0.686	-0.712	-0.728	-0.74	-0.746	-0.75	-0.754	-0.756
Gross in	0.86	0.873	0.882	0.886	0.888	0.891	0.892	0.894	0.895	0.895
Gross out	1.475	1.519	1.568	1.599	1.616	1.63	1.638	1.645	1.649	1.65
Equals: Net earnings by place of residence	53.088	54.541	56.09	57.266	57.931	58.529	58.881	59.2	59.324	59.316
Plus: Rental, personal interest, and personal dividend income	16.126	16.615	16.969	17.202	17.4	17.596	17.761	17.919	18.058	18.167
Plus: Personal current transfer receipts	14.134	14.588	14.876	15.048	15.227	15.403	15.562	15.706	15.843	15.957
Equals: Personal income	83.348	85.744	87.935	89.516	90.559	91.529	92.204	92.825	93.225	93.44
Less: Personal current taxes	7.278	7.483	7.683	7.831	7.921	8.005	8.059	8.109	8.137	8.148
Equals: disposable personal income	76.07	78.262	80.253	81.685	82.637	83.524	84.145	84.716	85.088	85.292
Real personal income	83.3	85.693	87.859	89.413	90.424	91.365	92.014	92.609	92.986	93.182
Real disposable personal income	76.025	78.215	80.183	81.591	82.514	83.374	83.971	84.519	84.87	85.057
PCE-price index, 2009=100	108.717	110.569	112.689	114.938	117.38	119.711	122.226	124.627	127.14	129.748
Real personal income with housing price	87.763	90.188	92.367	93.929	94.914	95.833	96.446	97.008	97.347	97.505
Real Disposable personal income with housing price	80.099	82.317	84.297	85.712	86.612	87.452	88.016	88.534	88.85	89.003
PCE-price index with housing price, 2009=100	103.188	105.059	107.189	109.412	111.827	114.129	116.608	118.975	121.444	123.995
Relative housing price	0.649	0.655	0.659	0.664	0.667	0.671	0.674	0.677	0.68	0.683

Table A6: Income (Billions of fixed 2015 $) continued										
Variable	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2035**	**2040**	**2045**	**2050**
Total earnings by place of work	66.887	66.88	66.848	66.769	66.743	66.683	65.113	63.732	62.414	61.093
Total wage and salary disbursements	48.141	48.137	48.115	48.055	48.031	47.979	46.78	45.756	44.774	43.79
Supplements to wages and salaries	12.003	12.018	12.029	12.028	12.036	12.035	11.785	11.549	11.316	11.087
Employer contributions for employee pension and insurance funds	8.238	8.249	8.257	8.256	8.261	8.261	8.089	7.927	7.767	7.61
Employer contributions for government social insurance	3.764	3.769	3.773	3.772	3.775	3.774	3.696	3.622	3.548	3.476
Proprietors' income with inventory valuation and capital consumption adjustments	6.606	6.579	6.55	6.521	6.503	6.484	6.314	6.154	6.01	5.867
Less: Contributions for government social insurance	6.639	6.641	6.641	6.635	6.633	6.627	6.464	6.317	6.173	6.032
Employee and self-employed contributions for government social insurance	2.875	2.872	2.869	2.863	2.859	2.853	2.768	2.695	2.625	2.555
Employer contributions for government social insurance	3.764	3.769	3.773	3.772	3.775	3.774	3.696	3.622	3.548	3.476
Plus: Adjustment for residence	-0.756	-0.756	-0.756	-0.754	-0.754	-0.754	-0.744	-0.747	-0.753	-0.755
Gross in	0.895	0.894	0.894	0.894	0.894	0.893	0.876	0.857	0.838	0.822
Gross out	1.651	1.651	1.65	1.648	1.648	1.647	1.62	1.604	1.591	1.577
Equals: Net earnings by place of residence	59.267	59.212	59.139	59.014	58.942	58.834	57.172	55.699	54.288	52.896
Plus: Rental, personal interest, and personal dividend income	18.28	18.386	18.499	18.606	18.722	18.843	19.161	19.502	19.783	20.002
Plus: Personal current transfer receipts	16.078	16.191	16.316	16.439	16.57	16.714	17.229	17.789	18.283	18.683
Equals: Personal income	93.626	93.789	93.953	94.059	94.234	94.39	93.562	92.989	92.353	91.582
Less: Personal current taxes	8.154	8.16	8.164	8.162	8.166	8.168	8.026	7.907	7.788	7.664
Equals: disposable personal income	85.471	85.629	85.789	85.897	86.068	86.222	85.536	85.082	84.566	83.917
Real personal income	93.353	93.506	93.661	93.761	93.931	94.082	93.264	92.691	92.053	91.278
Real disposable personal income	85.223	85.371	85.523	85.625	85.791	85.941	85.264	84.81	84.291	83.64
PCE-price index, 2009=100	132.343	135.025	137.701	140.478	143.251	146.119	161.39	178.216	196.977	217.559
Real personal income with housing price	97.64	97.758	97.88	97.95	98.095	98.22	97.253	96.567	95.824	94.945
Real Disposable personal income with housing price	89.136	89.253	89.376	89.451	89.594	89.721	88.91	88.356	87.744	86.999
PCE-price index with housing price, 2009=100	126.533	129.152	131.765	134.47	137.17	139.963	154.771	171.063	189.225	209.157
Relative housing price	0.685	0.687	0.689	0.69	0.692	0.694	0.7	0.705	0.711	0.716

Table A7: Population and Labor Force (in 000s)										
Variable	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Total population	2146.385	2191.459	2225.315	2261.753	2298.512	2335.371	2371.462	2406.874	2441.329	2474.636
By race and ethnicity										
White	976.28	988.044	994.197	1001.163	1007.868	1014.241	1019.906	1024.91	1029.152	1032.549
Black	218.426	222.164	224.774	227.584	230.382	233.142	235.784	238.313	240.693	242.912
Other	287.428	294.775	300.645	306.857	313.114	319.384	325.546	331.61	337.536	343.299
Hispanic	664.251	686.476	705.699	726.149	747.148	768.604	790.226	812.042	833.948	855.877
By age										
Ages 0-14	429.026	435.415	440.017	445.357	450.323	455.555	460.273	464.228	467.779	472.515
Ages 15-24	270.763	271.427	270.939	272.496	273.193	274.859	277.309	280.916	285.031	287.051
Ages 25-64	1145.847	1168.054	1182.757	1197.63	1213.214	1227.331	1240.868	1253.322	1264.995	1276.571
Ages 65 & older	300.748	316.563	331.601	346.27	361.781	377.626	393.012	408.408	423.524	438.499
Labor force	1051.311	1070.942	1083.597	1099.527	1114.971	1129.924	1143.861	1156.489	1169.197	1181.185
Labor force participation rate	0.629	0.626	0.623	0.621	0.619	0.616	0.614	0.611	0.607	0.604
Participation rates by gender										
Male (16 & older)	0.697	0.695	0.692	0.691	0.689	0.687	0.685	0.682	0.679	0.676
Female (16 & older)	0.563	0.559	0.555	0.553	0.551	0.548	0.544	0.541	0.538	0.534

Table A7: Population and Labor Force (in 000s) continued										
Variable	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2035**	**2040**	**2045**	**2050**
Total population	2506.886	2538.208	2568.492	2597.698	2626.043	2653.541	2776.025	2887.073	2996.305	3108.725
By race and ethnicity										
White	1035.171	1037.098	1038.29	1038.752	1038.599	1037.845	1025.13	1003.477	977.426	950.666
Black	244.967	246.878	248.631	250.214	251.651	252.947	257.337	259.624	260.595	260.638
Other	348.895	354.344	359.641	364.789	369.813	374.716	397.338	418.779	440.34	462.397
Hispanic	877.852	899.888	921.932	943.944	965.98	988.033	1096.22	1205.194	1317.943	1435.025
By age										
Ages 0-14	477.134	481.552	485.985	489.38	492.38	495.005	504.371	513.934	528.353	548.838
Ages 15-24	288.378	289.876	291.646	294.223	296.477	299.081	310.17	322.682	330.633	337.142
Ages 25-64	1287.208	1297.475	1306.877	1315.503	1324.049	1331.946	1372.421	1410.072	1452.443	1489.132
Ages 65 & older	454.166	469.304	483.984	498.592	513.137	527.508	589.062	640.384	684.876	733.613
Labor force	1191.124	1201.378	1211.212	1220.613	1229.709	1238.053	1272.675	1312.634	1352.234	1390.644
Labor force participation rate	0.601	0.598	0.595	0.593	0.59	0.587	0.573	0.565	0.559	0.554
Participation rates by gender										
Male (16 & older)	0.673	0.671	0.668	0.665	0.663	0.66	0.647	0.639	0.634	0.63
Female (16 & older)	0.531	0.528	0.525	0.522	0.519	0.516	0.502	0.494	0.488	0.482

Table A8: Demographics (in 000s)										
Variable	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Starting population	2102.238	2146.385	2191.459	2225.315	2261.753	2298.511	2335.371	2371.463	2406.875	2441.329
Births	28.806	29.35	29.761	30.075	30.425	30.768	31.063	31.34	31.58	31.816
Deaths	15.141	15.725	16.285	16.835	17.398	17.97	18.554	19.151	19.757	20.375
Natural growth	13.664	13.625	13.476	13.24	13.027	12.798	12.509	12.19	11.823	11.441
Population before migrants	2115.902	2160.01	2204.935	2238.555	2274.78	2311.309	2347.88	2383.653	2418.698	2452.77
Total migrants	30.483	31.45	20.38	23.199	23.732	24.062	23.583	23.222	22.632	21.866
Economic migrants	20.043	20.266	8.344	10.856	11.075	10.975	10.063	9.27	8.268	7.167
Retired migrants	5.794	5.626	4.914	5.074	5.25	5.438	5.621	5.783	5.944	6.1
International migrants	5.685	6.205	7.305	7.513	7.721	7.929	8.137	8.345	8.553	8.761
Special pops migrants	-1.04	-0.647	-0.183	-0.244	-0.314	-0.28	-0.239	-0.176	-0.133	-0.162
Total population	2146.385	2191.459	2225.315	2261.753	2298.512	2335.371	2371.462	2406.874	2441.329	2474.636

Table A8: Demographics (in 000s) continued										
Variable	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2035**	**2040**	**2045**	**2050**
Starting population	2474.636	2506.885	2538.208	2568.492	2597.698	2626.043	2752.68	2865.395	2974.131	3086.036
Births	32.037	32.243	32.428	32.588	32.705	32.809	33.431	34.521	36.025	37.618
Deaths	21.006	21.65	22.308	22.978	23.658	24.347	27.854	30.893	33.3	35.106
Natural growth	11.031	10.593	10.12	9.611	9.047	8.462	5.577	3.628	2.725	2.512
Population before migrants	2485.667	2517.478	2548.328	2578.103	2606.745	2634.506	2758.257	2869.024	2976.855	3088.548
Total migrants	21.218	20.73	20.164	19.595	19.298	19.035	17.768	18.049	19.448	20.177
Economic migrants	6.161	5.3	4.398	3.483	2.864	2.321	0.907	1.084	2.335	2.748
Retired migrants	6.265	6.415	6.536	6.65	6.755	6.838	7.006	7.037	7.13	7.449
International migrants	8.969	9.177	9.384	9.592	9.801	10.009	10.063	10.12	10.153	10.131
Special pops migrants	-0.176	-0.162	-0.154	-0.13	-0.122	-0.133	-0.208	-0.191	-0.17	-0.151
Total population	2506.886	2538.208	2568.492	2597.698	2626.043	2653.541	2776.025	2887.073	2996.305	3108.725