2023-2080 Population Forecasts

LONG-TERM PROJECTIONS FOR CLARK COUNTY, NEVADA

May 2023

Prepared by
Center for Business and Economic Research

Prepared for
Regional Transportation Commission of Southern Nevada,
Southern Nevada Water Authority,
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), a group of community demographers and analysts, and the Center for Business and Economic Research (CBER) at the University of Nevada, Las Vegas work together to develop a long-term forecast of Clark County's population and its growth that is consistent with the structural economic characteristics of the county. Toward this end, CBER employs a general-equilibrium demographic and economic model developed by Regional Economic Models, Inc. (REMI), specifically for Clark County.

We recalibrate the REMI model to incorporate the most recent available information regarding local employment and its growth and known local public and private investment in large-scale projects. The resulting long-term forecast predicts positive population growth throughout the range of the forecast. The Southern Nevada Regional Planning Coalition (SNRPC) estimates that Clark County's population was 2.33 million in 2022, a slight decrease of 0.05 percent from 2021, which largely reflects the 2020 Decennial Census adjustments. We expect that Clark County's population will reach approximately 2.85 million by 2040 and nearly 3.43 million by 2080.

Table 1 summarizes the Clark County population forecast, which CBER predicts will grow steadily in the short term at rates of 1.8 in 2023, 1.4 percent in 2024, and 1.3 percent in 2025 with a modest expansion of the local economy. The population growth rate will hit 2.3 percent in 2026, boosted by infrastructure investment, including the high-speed rail project and new hotel room construction. In the medium term, CBER expects the population growth rate to show modest growth, but the growth rate beginning in 2027 will start to decline over time with decreases in natural growth. That is, its growth rate tapers off as Clark County's population ages over time. As the Clark County economy continues to mature, the population growth stabilizes around 0.3 percent after 2074.

As with any forecast, potential risks exist that could lead to either an over- or under-forecast of population and its growth rate. CBER believes that the risk of over-forecasting population and its growth rate may exceed the risk of under-forecasting in the near term due to ongoing important economic uncertainties. The U.S. economy has slowed recently with the Fed's policy of higher interest rates, where it raises the federal funds rate to squash high inflation. Additional policy uncertainties exist that the forecast does not reflect. These policy uncertainties include but are not limited to potential responses to drought and water scarcity in the Western United States as well as the potential local shortages of "developable" land parcels. Our long-term forecasts, however, exclude business-cycle, seasonal, and irregular events, which respond to short-run risks. In summary, our forecast primarily provides a long-

term planning tool that addresses the trend movements in population, excluding the short-run business-cycle, seasonal, and irregular effects.

Table 1.   Clark County Final Population Forecast: 2015-2080

Year	Population Forecast	Change in Population Forecast	Growth in Population Forecast
2015	2,147,641*	45,403	2.2%
2016	2,205,207*	57,566	2.7%
2017	2,248,390*	43,183	2.0%
2018	2,284,616*	36,226	1.6%
2019	2,325,798*	41,182	1.8%
2020	2,376,683*	50,885	2.2%
2021	2,333,092*	-43,591	-1.8%
2022	2,331,934*	-1,158	-0.05%
2023	2,374,000**	42,066	1.8%
2024	2,407,000**	33,000	1.4%
2025	2,438,000**	31,000	1.3%
2026	2,494,000	56,000	2.3%
2027	2,542,000	48,000	1.9%
2028	2,583,000	41,000	1.6%
2029	2,617,000	34,000	1.3%
2030	2,645,000	28,000	1.1%
2031	2,670,000	25,000	0.9%
2032	2,691,000	21,000	0.8%
2033	2,711,000	20,000	0.7%
2034	2,731,000	20,000	0.7%
2035	2,750,000	19,000	0.7%
2036	2,770,000	20,000	0.7%
2037	2,789,000	19,000	0.7%
2038	2,809,000	20,000	0.7%
2039	2,828,000	19,000	0.7%
2040	2,848,000	20,000	0.7%
2045	2,935,000	16,000	0.5%
2050	3,014,000	15,000	0.5%
2055	3,095,000	17,000	0.6%
2060	3,176,000	16,000	0.5%
2065	3,250,000	14,000	0.4%
2070	3,315,000	13,000	0.4%
2075	3,374,000	11,000	0.3%
2080	3,427,000	10,000	0.3%

* SNRPC consensus population estimate.
**CBER 2023 Economic Outlook forecast, April 2023
Note: The changes and growth rates in population forecasts after 2040 are not cumulative. The forecast changes and growth rates represent the annual values. See Table C2 for the complete set of forecasts.

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I.   Introduction

Each year, the Regional Transportation Commission of Southern Nevada (RTC), the Southern Nevada Water Authority (SNWA), a group of community demographers and analysts, and the Center for Business and Economic Research (CBER) at the University of Nevada, Las Vegas 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 and its growth that is consistent with the structural economic characteristics of the county. Toward this end, CBER employs 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 feedback between economic and demographic variables. Special features allow the user to update the model to include the most current economic information. CBER recalibrates the model using information on recent local employment levels, the most recent national Gross Domestic Product (GDP) forecast, and spending on locally known large-scale 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 represent accurately and concisely 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 2001 and end in 2020. The most important variables include the aggregate totals of employment, the labor force, and population. The economic data for the most recent version of the model (REMI PI+ v3.0) are consistent with the North American Industry Classification System (NAICS). The REMI PI+ v3.0 model was released in 2022. Hence, the model's most recent data come from 2020, since the Bureau of Economic Analysis (BEA) personal-income data only become available with a two-year lag. The availability of the most recent income data sets the last year of history with each release of an updated model.

The REMI model is the best model available for describing how economies interact geographically.[1] These interactions may take place within a single economy (such as the interaction

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[1] 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,* 29(4), 363-374.

between house-price growth and employment growth in Clark County) or between two economies (such as the interaction between Southern Nevada and Southern California through migration flows). 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 and distribution theory, yet it still offers the flexibility required to model a regional economy like Clark County.

To guarantee that the model incorporates the most recent, available data, we make a series of adjustments to the model. These adjustments ensure that the forecast model includes the most up-to-date information when generating the final forecast. First, we update the model's national GDP and employment forecast, using the latest available national economic data from the Bureau of Economic Analysis (BEA) and the latest forecast from the University of Michigan's Research Seminar in Quantitative Economics (RSQE). Second, we rebase the population forecast to the most recent population estimate for Clark County available from the Southern Nevada Regional Planning Coalition (SNRPC). Third, we update the model with current Clark County employment data from the Bureau of Economic Analysis (BEA) and the Nevada Department of Employment, Training and Rehabilitation (DETR). Fourth, we adjust future hotel employment based on the expected number of hotel rooms that will be added in the near future. Fifth, we incorporate planned new investment in public and private infrastructure in the model using information, for example, from the RTC and the Las Vegas Convention and Visitors Authority (LVCVA). Lastly, we rebase the population forecasts that were generated by all the adjustments mentioned above with the most recent short-term Clark County population forecasts from CBER.

This report proceeds as follows. Section II examines the changes in the REMI model (out-of-the-box benchmark forecast) from the prior years' models. Section III presents sequentially the changes made to update the model and tailor it to more recent Clark County information. Section IV reports the population forecast and gives a brief discussion of the economic environment surrounding the forecast. Section V compares the population growth rate forecast with the previous years' forecasts. Section VI discusses the risks to the forecast. Finally, section VII concludes.

II. Comparison of REMI Models: Current and Previous Year

Based on past practice, we begin by comparing the most recent REMI out-of-the-box benchmark forecast prior to any model adjustments with the corresponding out-of-the-box benchmark forecasts from the REMI models used in prior reports. This allows us to examine how the new model differs from previous versions and to explore the basis of these differences.

The most recent data used to develop this year's REMI model end with observations from 2020. Thus, we refer to the current model by its last historical year 2020 (LHY2020) and the previous model by its last historical year 2019 (LHY2019).

Each year, the REMI staff and users discuss how the model works and propose adjustments and changes to improve the model's performance. The newest REMI model, PI+ v3.0, offers two major improvements: it includes the recent BLS employment projections from 2020 to 2030[2] as well as updated state and local government spending parameters. In addition, the new REMI model contains the most recent data history for 2020 and a revision of historical data back to 2001. The latest REMI model also offers additional years in the forecast period, running through 2080 instead of 2060.

REMI uses the BLS employment projections, which provide insight to guide its employment and labor force growth rates in the future. BLS revised down employment forecasts with the 2020-2030 projections compared to the 2019-2029 employment projections, which resulted in lower baseline employment forecasts produced by LHY2020 compared to LHY2019. Although the 2020-2030 projections expect that employment will grow at an annual rate of 0.7 percent over the next 10 years, this rate would have been only 0.1 percent, if the projection period started in 2019. BLS predicted 0.4 percent growth per year for the 2019-2029 employment projections, which is much higher than 0.1 percent from the 2020-2030 employment projections when including 2019. Despite the lower employment growth projections, the combination of employment growth by industry generated higher growth projections for Clark County compared to the United States with LHY2020. The 2020-2030 projections expect that leisure and hospitality, and healthcare and social assistance employment will grow by 2.2 and 1.6 percent, respectively, per year from 2020 to 2030. The REMI model also incorporated the labor-force projections from the 2020-2030 projections, which led to higher labor-force forecasts for Clark County with LHY2020 compared to LHY2019. This partly resulted in lower relative employment opportunity (REO) forecasts, which led to lower economic migration[3] forecasts for LHY2020 compared to LHY2019.

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[2] https://www.bls.gov/opub/mlr/2021/article/projections-overview-and-highlights-2020-30.htm.

[3] Economic migrants, under 65, emigrate from other regions to improve their living standards and seek better job opportunities. Three major components attract these interstate migrants according to REMI: relative employment opportunities, relative compensation rates, and amenity values. Relative employment opportunity captures employment opportunities in the region compared to the U.S. average. The relative compensation rate measures the real compensation (adjusted for taxes and housing prices in the region) rate compared to the national average level, while amenity values include factors such as climate, community safety, education, and so on. Economic migrants are working-age migrants who not only contribute to local human capital resources but also boost the development of local businesses.

REMI also updated and improved their state and local government spending equation specification and re-estimated the parameters of this government spending equation with the LHY2020 model. The GDP elasticities of state and local government expenditure were re-estimated by using the data from 1997 to 2019, while the previous parameters were calculated in 2015 by using the data from 1997 to 2011. According to REMI, the U.S. population grew by 20.4 percent from 1997 to 2019, while combined state and local government expenditure jumped significantly by 74.9 percent over the same period. Nevada experienced an 83.0 percent increase in combined state and local government expenditure even though the state posted the fastest population growth at 75.2 percent from 1997 to 2019. Interestingly, Nevada's GDP only increased by 74.2 percent despite a 75.2 percent growth in population, while the U.S. experienced 70.0 and 20.4 percent gains in GDP and population, respectively. REMI reports that the new GDP elasticities per capita of government spending are 0.44 and 0.62, respectively, for state and local government spending, which exceed the previous estimates of 0.38 and 0.50. A higher number suggests a stronger effect of GDP per capita on government spending. The new estimates for Nevada were 0.76 and 0.95, respectively, for state and local government spending, which compares to the previous estimates of 0.73 and 0.95. According to REMI, the re-estimated parameters may create a few additional jobs compared to the previous model, which may cause a minimal effect on the region's population forecast.

Finally, the REMI model not only contains updated historical data back to 2001 but also the most recent data history for 2020, which partly affected LHY2020's lower population growth rate forecasts compared to the LHY2019 model. As the model incorporated revised annual estimates from BEA for county and metropolitan area personal income and GDP, the real relative compensation rate (RWR) estimates were revised down compared to the previous model, which resulted in lower RWR forecasts from 2023 to 2044. This partly lowered the economic migration forecasts from LHY2020 when compared to LHY2019. These updates lead to differences in the out-of-the-box population forecasts between the LHY2020 and LHY2019 models.

Figures 1 and 2 compare the LHY2020 and LHY2019 population forecasts from the out-of-the-box models (i.e., before any updating for employment, infrastructure projects, the national GDP forecast, etc.).[4] The out-of-the-box population forecast arising from the LHY2019 model predicts higher population levels than the LHY2020 model from 2028 to 2060. Regarding population levels, the out-of-the-box model forecasts population in the LHY2020 model for 2023 is approximately 66,000 higher than the LHY2019

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[4] The detailed out-of-the-box results through 2080 appear in Table C1 of Appendix C.

model. The level forecast from LHY2019, however, surpasses the LHY2020 forecast in the year 2028, and the gap increases until 2044 by approximately 108,000 as LHY2019 has higher population growth forecasts than LHY2020 from 2023 to 2044. After 2044, the gap starts to decline from its peak in 2044 to 41,000 in the year 2060 due to LHY2020's higher population growth forecasts from 2045 to 2060, but the out-of-the-box forecasted population in LHY2020 is still lower than the forecast from LHY2019 in 2060.

Both the LHY2020 and LHY2019 models forecast decreasing trend in the growth rate over the forecast period (Figure 2). The population growth forecasts mirror the net migration forecasts (Figure 3). The LHY2019 model forecasts a growth rate of population that exceeds the growth rate of the LHY2020 model from 2023 to 2044, which reflect lower net migration[5] for LHY2020 compared to LHY2019 from 2023 to 2043. After 2044, both LHY2020 population growth and net-migration forecasts exceed those of the LHY2019 model. Despite a slightly larger net-migration forecast for LHY2020 in the year 2044, the population growth forecast for LHY2020 is lower compared to LHY2019 due to a smaller natural-increase (births - deaths) forecast for LHY2020 with -3,940 compared to -3,333 for LHY2019. The LHY2020 model predicts negative natural increases from 2035 while the LHY2019 model forecasts negative natural increase from 2039. The LHY2020 model predicts lower natural-increase forecasts from 2023 to 2048, which largely reflects lower birth-rate forecasts for LHY2020 from 2023 to 2043 and lower survival-rate forecasts for LHY2020 from 2023 to 2052 compared to LHY2019.

The lower net migration projections from 2023 to 2043 for LHY2020 compared to LHY2019 mainly reflect the lower net-economic-migration forecasts for the LHY2020 relative to the LHY2019 models (Figure 3). Economic-migration forecasts from LHY2020 are much lower than those of the LHY2019 model over the entire forecast horizon through 2060. Higher net-international-migration forecasts for the LHY2020 model, however, boosted the net-migration forecasts for LHY2020 as net-international-migration projections for LHY2020 are much higher than those from LHY2019 by approximately 11,000 for each forecasted year (Figure 4).

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[5] The REMI model defines four components of net migration: economic, retired, special, and international migration. Economic migrants include individuals under 65 who emigrate from other regions to improve their living standards and to seek better job opportunities. Retired migrants include individuals 65 and older who move from one region to another and do not respond to economic conditions. The REMI model explains that economic migrants are the difference between the net domestic migrants and the net retired migrants. Special migrants include prisoners, college students, and military personnel and their dependents. Finally, net international migration includes migrants who move from outside the United States and into the 50 states and the District of Columbia, which includes migrants relocated from Puerto Rico and U.S. territories, Armed Forces, permanent and temporary migrants such as students, refugees, and illegal migrants.

Figure 1. **Clark County Population Forecasts: REMI Out-of-the-Box LHY2020 and LHY2019: 2023-2080**
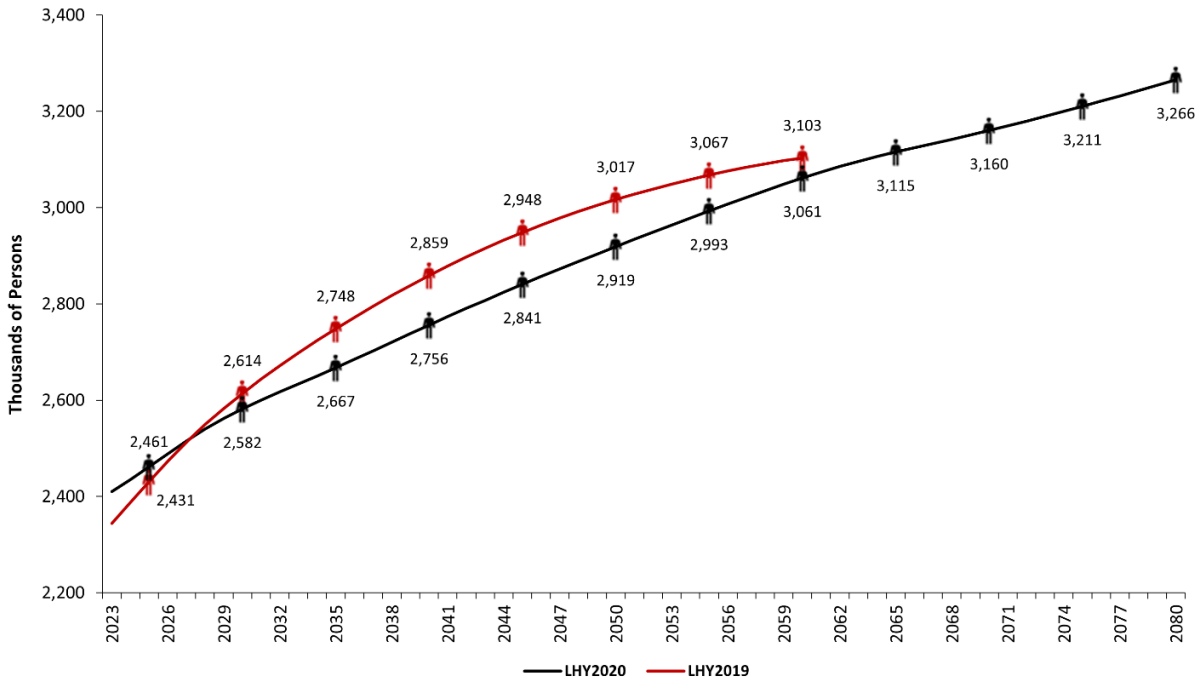
Note: Out-of-the-box refers to the model prior to recalibration. These numbers are not the final forecast.

Figure 2. **Clark County Population Growth Rate Forecasts: REMI Out-of-the-Box LHY2020 and LHY2019: 2023-2080**
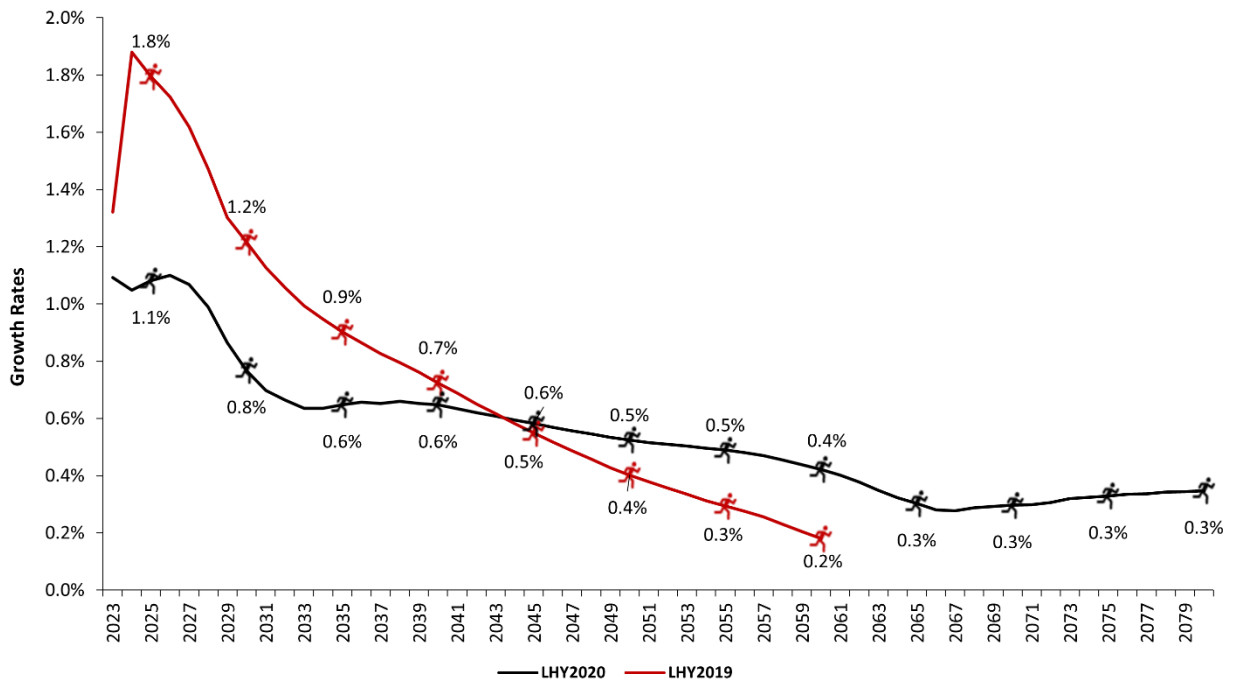
Note: Out-of-the-box refers to the model prior to recalibration. These numbers are not the final forecast.

Figure 3. Clark County Net Migrant and Net Economic Migrant Forecasts: REMI Out-of-the-Box LHY2020 and LHY2019: 2023-2080
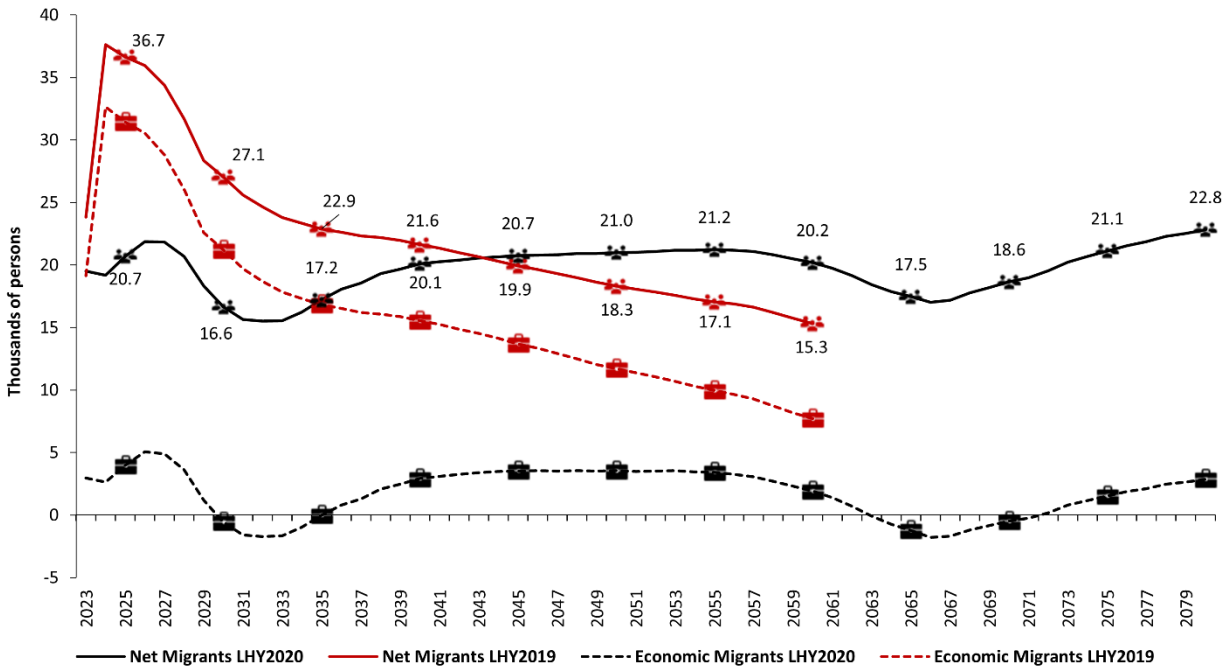
Note: Out-of-the-box refers to the model prior to recalibration. These numbers are not the final forecast.

Figure 4. Clark County Net International Migrant Forecasts: REMI Out-of-the-Box LHY2020 and LHY2019: 2023-2080
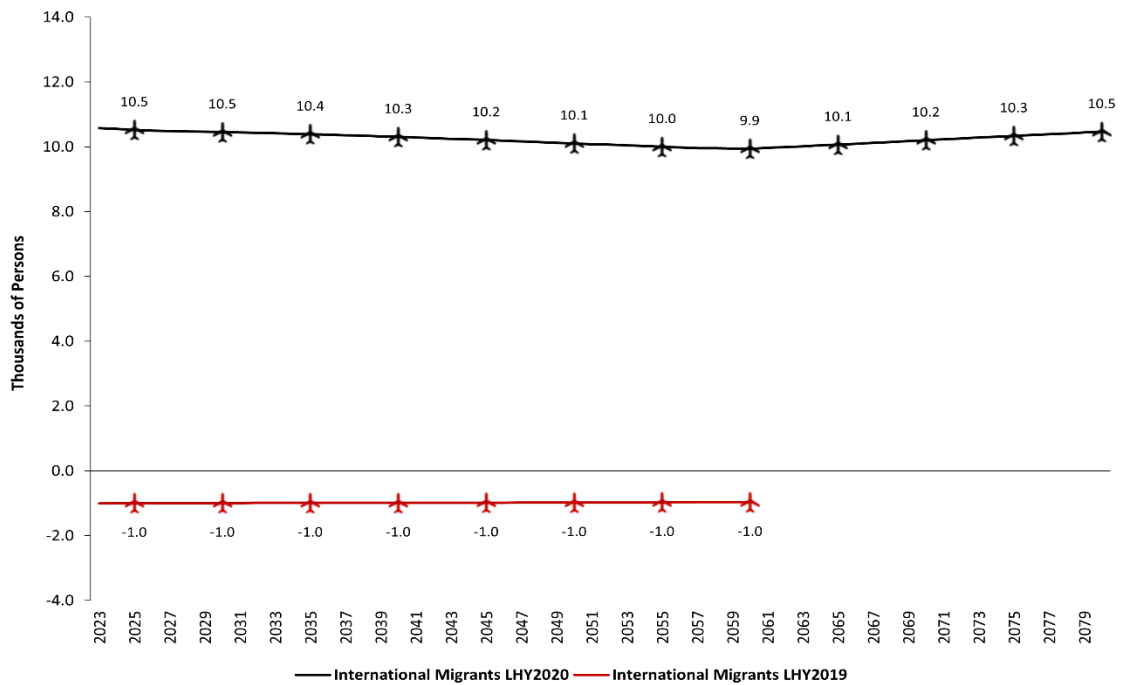
Note: Out-of-the-box refers to the model prior to recalibration. These numbers are not the final forecast.

Table 2 compares the REMI out-of-the-box economic and demographic forecasts between the LHY2020 and LHY2019 models for the period between 2023 and 2060. The LHY2020 out-of-the-box model forecasts a stronger Clark County economy in 2060 in terms of real GDP as Clark County GDP will account for 0.64 percent of the US real GDP, which is higher than 0.63 percent for LHY2019. In terms of employment, however, the LHY2020 out-of-the-box model projects that Clark County employment will account for 0.72 percent of total U.S. employment in 2060, which is smaller than the 0.73 percent from LHY2019. Despite a lower net-migration forecast in 2023 for the LHY2020 model relative to the LHY2019 model, the population forecast is higher for LHY2020, as the Census estimated a 2,315,963 population in Clark County in 2020, while the LHY2019 model forecasts a 2,281,517 population in 2020. The Census, however, revised their estimate to 2,273,386, 1.8 percent lower than their previous estimate by the time the LHY2020 model was released. The population forecast in 2060 for LHY2020 is lower compared to LHY2019 largely due to a cumulative effect of reduced forecasts in net economic migration over the entire forecast period (Figure 3). Note that the lower population forecast for LHY2020 in the year 2060 reflects a smaller projected population ages 65 and over compared to LHY2019.

Table 2.   Clark County REMI Out-of-the-Box Forecast Comparison: LHY2020 and LHY2019

	2023			2060		
	LHY2020	**LHY2019**	**Change to forecast**	**LHY2020**	**LHY2019**	**Change to forecast**
Population (Thousands)	2,409.82	2,343.62	2.8%	3,061.41	3,102.77	-1.3%
Total Employment (Thousands)	1,384.66	1,349.94	2.6%	1,658.11	1,713.58	-3.2%
Total Employment as % of Nation	0.66	0.66	0.2%	0.72	0.73	-1.3%
Gross Domestic Product (Billions of Fixed 2012 Dollars)	123.33	117.66	4.8%	243.35	239.98	1.4%
Gross Regional Product as % of Nation	0.58	0.57	1.4%	0.64	0.63	0.5%
Migrants (Thousands)						
Economic Migrants	2.96	19.16	-84.5%	1.93	7.71	-75.0%
Retired Migrants	5.91	5.96	-0.9%	8.36	8.60	-2.8%
International Migrants	10.58	-1.00	-1154.5%	9.94	-0.97	-1125.7%
Population by Age (Thousands)						
Ages 0-14	438.68	426.56	2.8%	463.08	459.56	0.8%
Ages 15-24	293.96	283.72	3.6%	331.92	330.87	0.3%
Ages 25-64	1,270.77	1,225.17	3.7%	1,482.64	1,468.89	0.9%
Ages 65+	406.41	408.18	-0.4%	783.77	843.45	-7.1%

Note: The numbers for both LHY2020 and LHY2019 models refer to the models prior to adjustments.

III.   Recalibrating the Model

As noted previously, county-level personal income data only become available with a two-year lag. As a result, the REMI model also imposes a two-year lag on all its data history that ends with 2020 data for the current model, PI+ v3.0, released in 2022. To update the model, we incorporate available, pertinent model information, including the most recent national GDP forecast, the most recent population estimates from SNRPC and forecasts from CBER, the most recent employment figures and forecasts, and the spending on public and private capital projects to reflect Clark County information in the forecast. We describe each update in sequence.

A.   *Adjustment of the national economic forecast*

The REMI model relies on a baseline national GDP forecast from the University of Michigan's RSQE. The PI+v3.0 model includes the RSQE's February 2022 release, and its latest historical year is 2020. We adjust the model's national GDP forecast using BEA's most recent data and the February 2023 national GDP forecast from RSQE. Figure 5 displays the comparison between RSQE and REMI out-of-the-box forecasts[6] for 2023 and 2024. BEA estimates that the national real GDP expanded by 5.9 and 2.1 percent, respectively, in 2021 and 2022, while the REMI model forecasted 5.6 and 4.0 percent real GDP growth. The REMI model predicts 2.7 and 1.4 percent increases for the real GDP in 2023 and 2024, respectively, while the most recent RSQE's forecasts expect, respectively, 1.2 and 0.7 percent growth. The downward revisions in forecasts largely respond to reduced residential investment forecasts, which reflect sharper interest rate increases than expected.

CBER also updates the REMI model with the most recent national employment data from BEA. BEA provides 2021 employment estimates by detailed sectors. That is, BEA estimates that the United States had 201.14 million employees in 2021, which is much higher than REMI's projection of 197.00 million (Table 3). This difference largely reflects the 2020 estimate revision by BEA, which previously reported total jobs of 190.78 million in 2020 and revised the estimate to 195.30 million jobs with the revision. This justifies the need to update the REMI model. The adjusted national forecast generates a new baseline forecast for Clark County. We, then, use the baseline forecast for the subsequent adjustments.

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[6] All out-of-the-box forecasts use the original REMI PI+v3.0 model before any REMI updates.

Figure 5.   U.S. Real GDP Forecasts: RSQE vs. REMI Out-of-the-Box from 2021 to 2024
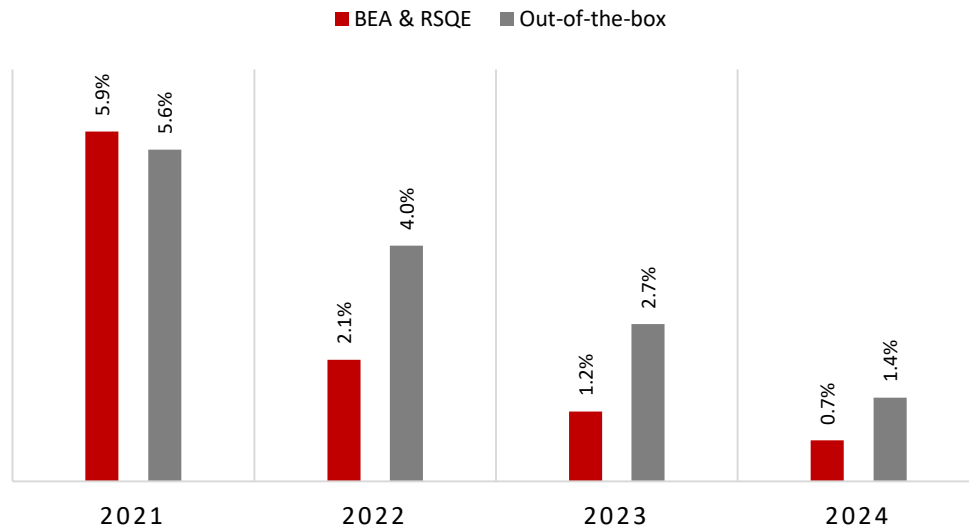
Note: REMI out-of-the-box growth rates from 2021 to 2023 reflect the RSQE's February 2022 forecasts. For BEA & RSQE, the growth rates for 2021 and 2022 are based on the BEA estimate, but the growth rates for 2023 and 2024 show the February 2023 projections by RSQE.

Table 3.   BEA Estimates vs. REMI Out-of-the-Box Forecasts (in millions) for the U.S. Employment in 2021

INDUSTRIAL CLASSIFICATION	REMI FORECASTS	BEA ESTIMATES
Forestry, fishing, and hunting	0.94	0.93
Mining	0.91	0.92
Utilities	0.58	0.60
Construction	10.78	11.67
Manufacturing	13.31	13.08
Wholesale trade	6.54	6.31
Retail trade	19.25	19.12
Transportation and warehousing	9.61	10.40
Information	3.36	3.41
Finance and insurance	10.59	11.72
Real estate and rental and leasing	9.02	10.10
Professional, scientific, and technical services	14.83	14.81
Management of companies and enterprises	2.79	2.75
Administrative, support, waste mgmt, and remediation services	12.08	12.43
Educational services; private	4.62	4.68
Health care and social assistance	22.66	22.88
Amusement, gambling, recreation	3.88	4.16
Accommodation and food services	13.85	13.55
Other services (except public administration)	10.55	10.96
State & local government	19.27	19.18
Federal civilian	3.06	2.94
Federal military	1.87	1.93

Farm	2.64	2.59
TOTAL	***197.00***	***201.14***

Note: Although BEA does not provide employment in 3-digit NAICS sectors at the county level, it provides 3-digit NACIS employment at the national level. Therefore, CBER incorporated the 2021 employment estimates for 70 sectors from BEA into the model. The table above shows the 23 sector employment estimates.

B.   Rebasing the population forecast I

We rebase the population forecast using the population update feature in the REMI model. We update the population in 2022 based on the most recent SNRPC Clark County population estimates, that is 2.33 million, a slight decline of 0.05 percent from 2021. The SNRPC population estimates have decreased for the last two years, which largely reflects the 2020 Decennial Census of 2.27 million in 2020.

C.   Employment adjustment

The county-level employment data in REMI come from the BEA's local area personal income data, which only includes a 23-sector breakout. Even though the BEA reports the county-level employment data for 23 sectors, the BEA supplies the county-level wage data for 70 sectors. This means that REMI calculates employment for 70 sectors by incorporating the county-level wage data. Although the most recent historical year in the model's employment data is 2020, BEA employment data are available for 2021. Table 4 shows the REMI out-of-the-box forecasts and BEA estimates for Clark County employment for 23 sectors. The total employment between the REMI forecast and BEA estimate for 2021 appears different by approximately 59 thousand, which largely reflects the 2020 estimate revisions by BEA from 1,240 thousand to 1,284 thousand. To ensure that the model reflects the accurate employment information by sector for 2021, we update the model's employment data with BEA estimates for the 23 sectors in 2021. We also update the model's employment data for 2021 as most wage and salary employment data are available from the Nevada DETR for 2022. We, therefore, update the model to account for the most recent information.

Table 4.   Model Job Adjustments (in thousands) for 2021 with BEA Estimates

INDUSTRIAL CLASSIFICATION	REMI FORECASTS	BEA ESTIMATES
Forestry, fishing, and hunting	0.47	0.46
Mining	1.55	1.58
Utilities	2.92	2.88
Construction	82.52	86.26
Manufacturing	29.28	29.76
Wholesale trade	29.48	29.28
Retail trade	133.70	136.24
Transportation and warehousing	95.04	104.27
Information	14.20	15.96
Finance and insurance	70.31	80.77
Real estate and rental and leasing	71.92	79.18
Professional, scientific, and technical services	76.40	79.60
Management of companies and enterprises	26.34	26.54
Administrative, support, waste mgmt, and remediation services	98.78	103.33
Educational services; private	14.51	16.47
Health care and social assistance	111.85	118.63
Amusement, gambling, recreation	36.44	41.40
Accommodation and food services	230.64	229.37
Other services (except public administration)	62.99	67.01
State & local government	88.32	87.32
Federal civilian	15.04	14.66
Federal military	16.21	17.13
Farm	0.44	0.41
TOTAL	**1309.35**	**1368.49**

Note: BEA estimates are also adjusted employment.

The latest growth rates for the REMI model forecasts as well as recent DETR estimates appear in Table 5. The actual growth rates from DETR differ from the REMI forecasts, suggesting a need for adjustment. That is, the growth rate estimate by DETR of total employment was 8.7 percent in 2022, which is substantially higher than the REMI forecast of 4.3 percent. This mainly reflects stronger recovery and expansion in most sectors except for the monetary authorities and hospital sectors than the REMI model expected. The REMI model predicts that Clark County employment would fully recover in 2024 from the COVID-19 recession, while the most recent employment data show that employment recovered in 2022. The employment update proceeds as follows. First, we substitute BEA employment by 23 sectors into the REMI model and get the 70-sector estimates from the REMI model for 2021. Second, we compute the annual percentage change using DETR data and apply them to produce new estimates for 2022. This procedure implicitly assumes 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 5. **Employment Growth Rates for Clark County Before DETR Adjustment for 2022**

INDUSTRIAL CLASSIFICATION	REMI FORECASTS*	DETR ESTIMATES
Construction	2.43%	9.40%
Wholesale Trade	1.19%	8.33%
Retail Trade	-2.24%	3.22%
Transit, Ground Passenger Transportation	8.02%	22.39%
Monetary Authorities, Et Al.	2.78%	0.56%
Ins Carriers, Related Activities	2.67%	5.21%
Real Estate	4.02%	10.86%
Professional, Technical Services	5.24%	6.67%
Management of Companies	4.71%	16.27%
Administrative, Support Services	5.59%	13.17%
Ambulatory Health Care Services	3.64%	8.47%
Hospitals	4.22%	1.72%
Amusement, Gambling, And Recreation	9.90%	14.47%
Accommodation	9.04%	15.92%
Food Services, Drinking Places	4.04%	14.79%
State & Local Government	2.97%	3.57%
TOTAL	**4.29%**	**8.72%**

*The 2022 REMI forecasts are updated with the GDP and BEA updates.
Note: The total growth rates for DETR estimates are calculated after adjusting the employment forecasts with the DETR data for available sectors. Therefore, they do not represent actual DETR's growth rate estimates.

Table 6 reports the updated employment data by category for the model. The Clark County job growth numbers in 2022 show that local economic conditions fully recovered from the COVID-19 recession. That is, BEA estimates that Clark County employment plummeted by 7.5 percent in 2020 but recovered strongly by 6.6 percent in 2021. The DETR estimates show that Clark County employment not only fully recovered from the COVID-19 pandemic but also expanded substantially in 2022 as the employment level surpassed the 2019 level by 7.2 percent. Most sectors experienced gains except for apparel manufacturing; leather and allied product manufacturing, and federal military sectors. The substantial growth partly reflects strong recovery in the leisure and hospitality employment, boosted by pent-up demand. In addition, key sectors such as construction, retail sales, real estate, professional, scientific, and technical services, administrative and support services, and ambulatory health care services experienced strong gains in 2022. As a result, Southern Nevada's economy added roughly 119,000 jobs in 2022.

Table 6.   Model Job Adjustments (in thousands) for 2022 with DETR Estimates

INDUSTRIAL CLASSIFICATION	BEA ESTIMATES	DETR GROWTH RATE	ADJUSTED JOB LEVELS
	2021	*2022*	*2022*
Forestry et al.	0.43	6.70%	0.46
Support act for agriculture and forestry	0.02	8.33%	0.03
Oil, gas extraction	0.03	6.67%	0.03
Mining (except oil, gas)	1.53	8.18%	1.65
Support activities for mining	0.02	11.11%	0.02
Utilities	2.88	3.82%	2.99
Construction	86.26	9.40%	94.37
Wood product manufacturing	0.52	11.03%	0.57
Nonmetallic mineral prod manufacturing	2.68	9.84%	2.95
Primary metal manufacturing	0.45	39.06%	0.62
Fabricated metal prod manufacturing	2.98	12.66%	3.36
Machinery manufacturing	0.69	14.14%	0.78
Computer, electronic prod manufacturing	0.54	10.52%	0.60
Electrical equip, appliance manufacturing	1.29	14.97%	1.48
Motor vehicle manufacturing	0.21	12.38%	0.24
Trans equip mfg exc motor vehicle	0.32	5.05%	0.33
Furniture, related prod manufacturing	1.32	3.50%	1.36
Miscellaneous manufacturing	6.26	10.79%	6.93
Food manufacturing	3.67	0.68%	3.69
Beverage, tobacco prod manufacturing	0.86	4.76%	0.90
Textile mills; textile prod mills	0.56	13.68%	0.64
Apparel manufacturing	0.87	-1.72%	0.86
Paper manufacturing	0.66	6.65%	0.71
Printing, related supp act	2.78	4.89%	2.92
Petroleum, coal prod manufacturing	0.04	5.13%	0.04
Chemical manufacturing	1.19	3.10%	1.23
Plastics, rubber prod manufacturing	1.88	5.97%	1.99
Wholesale trade	29.28	8.33%	31.71
Retail trade	136.25	3.22%	140.64
Air transportation	10.55	6.14%	11.19
Rail transportation	0.27	4.06%	0.28
Water transportation	0.08	7.23%	0.09
Truck transportation	8.08	2.64%	8.29
Couriers and messengers	12.15	2.95%	12.51
Transit, ground pass transportation	33.51	22.39%	41.01
Pipeline transportation	0.02	0.00%	0.02
Scenic, sightseeing transportation; supp	8.43	5.44%	8.89
Warehousing, storage	31.18	2.72%	32.03
Publishing, except internet	3.36	5.28%	3.53
Motion picture, sound rec	2.36	5.30%	2.48
Data processing, hosting, and rel services	3.50	4.06%	3.64

Table 6.   Model Job Adjustments (in thousands) for 2021 with DETR Estimates (continued)

INDUSTRIAL CLASSIFICATION	BEA ESTIMATES	DETR GROWTH RATE	ADJUSTED JOB LEVELS
	2021	2022	2022
Broadcasting, except int;	1.76	5.22%	1.86
Telecommunications	4.99	0.00%	4.99
Monetary authorities, et al.	22.34	0.56%	22.47
Sec, comm contracts, inv	39.02	5.21%	41.06
Ins carriers, rel act	19.40	5.21%	20.41
Real estate	71.18	10.86%	78.91
Rental, leasing services	8.00	3.95%	8.32
Prof, tech services	79.60	6.67%	84.90
Mgmt of companies, enterprises	26.54	16.27%	30.86
Administrative, support services	100.14	13.17%	113.34
Waste mgmt, remediation services	3.19	9.25%	3.48
Educational services	16.47	6.67%	17.57
Ambulatory health care services	59.49	8.47%	64.53
Hospitals	26.70	1.72%	27.16
Nursing, residential care facilities	11.20	3.11%	11.55
Social assistance	21.24	3.97%	22.08
Performing arts, spectator sports	24.25	11.23%	26.98
Museums et al.	0.57	13.99%	0.65
Amusement, gambling, recreation	16.58	14.47%	18.97
Accommodation	131.08	15.92%	151.95
Food services, drinking places	98.28	14.79%	112.82
Repair, maintenance	14.55	4.18%	15.16
Personal, laundry services	35.96	10.96%	39.90
Membership assoc, organ	9.42	4.60%	9.86
Private households	7.08	4.90%	7.43
State & local government	87.32	3.57%	90.44
Federal civilian	14.66	0.28%	14.70
Federal military	17.13	-0.62%	17.02
Farm	0.41	6.85%	0.44
TOTAL	**1,368.50**	**8.72%**	**1,487.87**

D.   Hotel room adjustment

We adjust future hotel employment based on the expected number of hotel rooms added in each of the next few years. The additional rooms and related employment represent either properties that are under construction with fixed opening dates, or properties that have development plans and a high probability of project completion during the specified year. In this way, we ensure that the model includes a good short-term forecast of new hotel investment and employment.

As of March 10, 2023, the LVCVA projects that hotel/motel construction will add an additional 4,642 rooms to the local room inventory by the end of 2023 (Table 7). This includes the opening of Aloft Hotel; SpringHill Suites Las Vegas Airport; two Home2Suites by Hilton; Delta Hotels by Marriott; Durango, A Station Casinos Resort; and Fontainebleau Las Vegas. In 2024, the LVCVA projects that hotel/motel construction will add an additional 1,175 hotel/motel rooms to the room inventory. This includes the opening of Element Las Vegas Airport, AC Hotel by Marriott, Element Las Vegas at Grand Central Parkway and Symphony Park Avenue, Atwell Suites at the Pass, and Dream Las Vegas. Finally, the LVCVA expects to see an additional 5,315 rooms added to the room stock in 2025 by TBD-Tilman Fertitta, AC Hotel by Marriott, SpringHill Suites by Marriott, and All Net Resort and Arena. Overall, Las Vegas is expected to see an additional 11,132 hotel/motel rooms added to inventory by the end of 2025, which is a robust 7.3 percent increase compared to the current available room inventory.[7]

Table 7.   Expected Additional Employment due to New Rooms: Projections for 2023-2025

Year	LVCVA Room Addition Projections	New Jobs due to New Rooms*	REMI Jobs Increase**	Cumulative Additional Jobs After Hotel Room Adjustment
2023	4,642	5,570	3,544	2,026
2024	1,175	1,410	575	2,861
2025	5,315	6,378	427	8,812

*Used a jobs-to-room multiplier of 1.2 (See Appendix A). For example, 5,570 is calculated by 4,642 times 1.2.
** Projected accommodation job increases after calibrated national economic estimates and projections, Clark County population, and employment estimates in the REMI model.
Note: CBER did not include Silverton's 300 rooms in 2023, which will close for 5 months due to remodeling. We calibrated cumulative additional jobs after hotel room adjustment in the REMI model.
Source: LVCVA; CBER

The model adjustment for new hotel construction uses a jobs-to-room ratio of 1.2, which we calculated as follows.[8] First, we expect new hotel rooms to create new jobs in hotel services. Using historical information from 2012-2021, we take the historical average ratio of annual accommodation employment from the Bureau of Labor Statistics (BLS) divided by the total number of hotel rooms for both the Casino and non-Casino sectors. This produces job-to-room ratios of 1.5 and 0.7 for casino accommodation and non-casino accommodation, respectively. We, then adjust based on the shares of casino and non-casino rooms, 0.61 and 0.39 respectively, for new hotel construction.[9] From this calculation, we generate a weighted jobs-to-room multiplier of roughly 0.9 for hotel services. New hotel rooms will also generate secondary economic activity and, hence, additional jobs in other sectors. For

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[7] As of March 2023, Las Vegas had 151,771 available rooms in inventory according to the LVCVA.

[8] The detailed computation of the jobs-to-room ratio appears in Appendix A.

[9] See Appendix B for the casino and non-casino calculation.

example, increased tourism activity from new hotel rooms will also increase the demand for food services and other tourism-related industries. We account for these new jobs as follows. We, first, use each industry's location quotient[10] to estimate the portion of the industry's employment attributable to tourism activity. We, then, take the historical average ratio of the annual employment in each of these sectors, which is attributable to tourism activity divided by the total hotel rooms. The sum of the ratios for the food services and other tourism-related industries is approximately 0.3. This, together with the jobs-to-room multiplier of 0.9 for hotel services, produces the overall jobs-to-room ratio of 1.2. We, then, use the jobs-to-room multiplier as the multiplicand times the number of additional rooms, producing a cumulative increase of about 9,000 jobs by 2025 (Table 7).

The method to calculate the estimated cumulative addition jobs after hotel room adjustment differs from the method we used for the last three years due to the COVID-19 recession. For the last three years, we added cumulated new jobs due to new rooms without considering the job additions projected by the REMI model. That is, we assumed that the job additions projected by the REMI model were due to recovery from the COVID-19 pandemic. The method used this time is the one we used before 2020. This method only includes the number of additional jobs *over and above* the rooms and jobs already accounted for in the model. This means that we assume that the existing number of rooms would be managed by the same number of hotel jobs for the projected period by the LVCVA. That is, an increase or decrease in REMI jobs must first be completely offset, and only then we do calibrate projected additional jobs into the REMI model. We return to this method as the current tourism employment has almost recovered from the COVID-19 pandemic.

E.   Transportation and infrastructure improvements

Clark County continues to invest in transportation infrastructure such as roads, highways, and mass transit. The REMI model assumes that public-infrastructure investment will follow a path consistent with the model history. Thus, some local spending on public infrastructure, such as road building and additional services, is built into the model. One-time monies, however, tend to come from outside the region (e.g., federal transportation funding). We adjust the model to incorporate these large transportation projects in the forecast.

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[10] The Location Quotient (LQ) compares Clark County's employment in a given industry sector to that of the nation. An LQ greater than 1 indicates that the area has proportionately more workers than the nation employed in that specific industrial sector. This implies that the area is producing more than is consumed by its residents. Hence, the portion of the LQ that is above 1 represents, CBER assumes, the proportion of the industry's employment attributable to tourism activity.

The estimated federal and private funding in transportation-infrastructure investment is about $11.5 billion between 2023 and 2050 (Figure 6). We annualize expected transportation-infrastructure expenditures from RTC of Southern Nevada and include them in the REMI model as new construction projects. In addition, we assume that federal funding in transportation-infrastructure investment after 2050 will continue with a reasonable expectation that the federal funding will not fall to zero. Rather, we apply the flat amount of federal funding after 2050, where the REMI model adjusts this amount for inflation.

Figure 6. The Estimated Federal and Private Funding Allocation for the Regional Transportation Plan for Southern Nevada 2023-2050

The estimated federal and private funding in transportation–infrastructure investment is approximately **$11.5 billion** between 2023 and 2050.

■ FY 2023 ■ FY 2024 ■ FY 2025 ■ FY 2026-2030 ■ FY 2031-2035 ■ FY 2036-2040 ■ FY 2041-2045 ■ FY 2046-2050
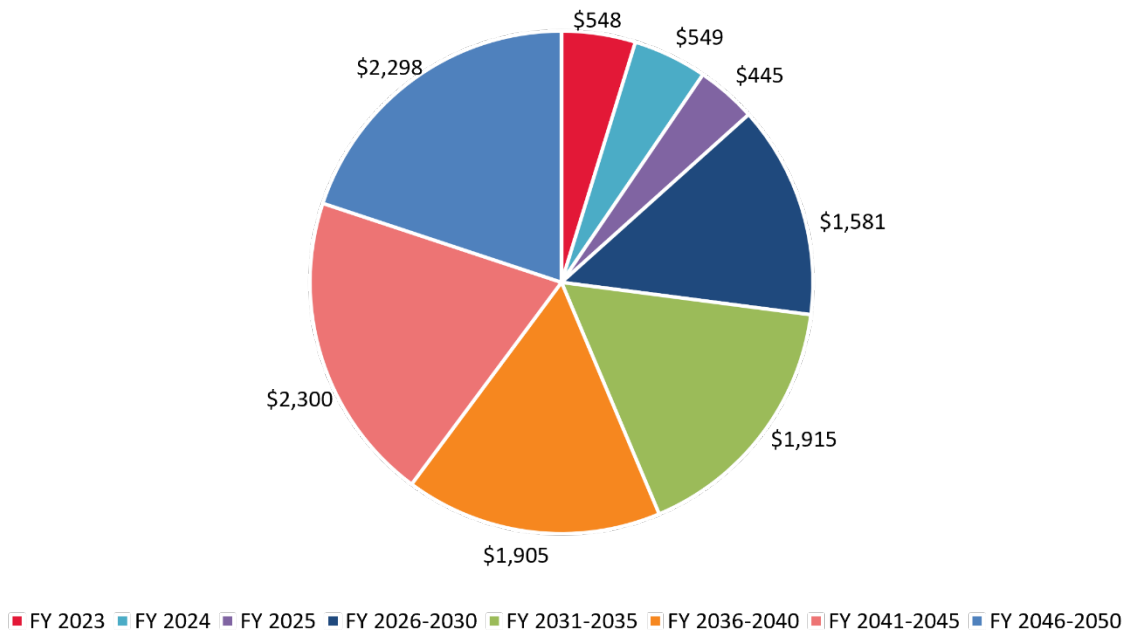
Note: The amount shown above only includes federal and private funding and is displayed in millions.
Source: The Regional Transportation Commission (RTC) of Southern Nevada

F.   Rebasing the population forecast II

We rebase the population forecasts produced by calibrating all the adjustments mentioned above with the most recent short-term population growth rate forecasts from CBER's 2023 Spring Economic Outlook. We estimate that Clark County will grow by 1.8, 1.4, and 1.3 percent, respectively, in 2023, 2024, and 2025. The REMI model expects 3.3, 2.8, and 2.6 percent growth in population in 2023, 2024, and 2025, respectively, after the adjustments with national economic estimates and forecasts, Clark County population and employment estimates, and projected local investments. The REMI model provides long-

term forecasts that exclude noise such as business-cycle, seasonal, and irregular events. The model's high population growth projections are largely due to the current unprecedented economic conditions with the lingering effect of the COVID-19 recession. That is, the recent new jobs were mainly filled by returning workers who once dropped out from the labor force due to the COVID-19 pandemic. The high growth rates predicted by REMI are because the model expects economic migrants will be mainly employed for the expected new jobs in the short term.

Therefore, CBER rebases the population forecasts after the adjustments with national economic estimates and forecasts, Clark County population and employment estimates, and projected local investments. We, first, rebase the forecasts from 2023 to 2025 by using the CBER's short-term population growth rate forecasts. We update the level population forecasts from 2023 to 2025 by using the CBER's short-term population growth rate forecasts and use the population growth-rate forecasts after the adjustments mentioned above for the subsequent adjustments.

Figure 7.   Clark County Population Growth Rate Forecasts Before and After Rebasing II: 2023-2025
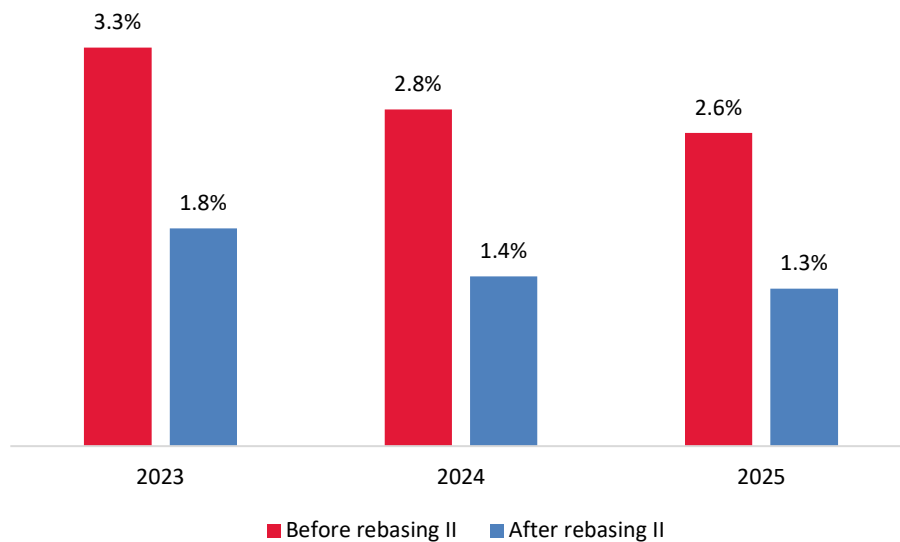
Note: The population growth rate forecasts before rebasing II are the REMI model forecasts after calibrating national economic estimates and forecasts, Clark County population and employment estimates, and projected local investments. The growth rate forecasts after rebasing II are CBER's short-term population forecasts and we updated the population level forecasts by using these forecasts.

IV.   Analysis of the Economic and Demographic Forecast

The forecast predicts modest rates of population growth for Southern Nevada in the near term with 1.8, 1.4, and 1.3 percent, respectively, in 2023, 2024, and 2025. The growth rate forecasts, however, jumped to 2.3 percent in 2026 and then decline over the forecast period extending out to 2080. The rate of growth, which decidedly exceeded the national average over the past 50 years, is expected to remain above the

national growth rate, but the gap in growth rates between Clark County and the United States is predicted to narrow as Clark County is expected to age faster than the average U.S. population due to lower birth rates and increasing ratio of retired migration to net migration over time. The economic forecast calls for the continuation of the economic expansion over the forecast horizon except for 2030. The negative employment growth forecast in 2030 is largely due to a weak growth of 0.1 percent for the United States, which is forecasted to be caused by a decline in employment for Las Vegas' key sectors such as construction, transportation and warehousing, and accommodation and food services. Clark County expects to experience a slight decline in employment in 2030 as the above-mentioned key sectors will account for more than 30 percent of Clark County employment in 2030, which is substantially higher than 18 percent for the U.S. average. Tables 8, 9, and 10, respectively, report the final population, employment, and real GDP predictions for Clark County from the recalibrated model.

A.   *Population*

In the short term, the current forecast predicts moderate rates of population growth in Southern Nevada. CBER predicts that the population in Clark County will grow at rates of 1.8 percent in 2023, 1.4 percent in 2024, and 1.3 percent in 2024 (Table 8). The population growth rate will hit 2.3 percent in 2026 with strong economic activity, boosted by infrastructure investment, including the high-speed rail project and new hotel room additions. CBER expects the population growth rates in the medium term to be robust but will decline over time with decreases in natural growth (births minus deaths). We forecast the population growth rate for Clark County to be 0.5 percent in 2060 and 0.3 percent in 2080.

CBER forecasts that Clark County will add roughly 42,000 new residents in 2023. After adding 56,000 new residents in 2026, population gains decline to 20,000 in 2040 and 10,000 in 2080 with an aging population. The population forecast predicts that Clark County's population will increase to roughly 3.43 million by 2080.

Figure 8 shows population growth rate forecasts for Clark County and the United States. The gap in growth rates between Clark County and the United States is predicted to narrow as Clark County is expected to age faster than the average U.S. population due to lower birth rates and an increasing ratio of retired migration to net migration over time. That is, the model predicts that the share of the population ages 65 and above will account for 25.1 and 27.9 percent, respectively, in 2060 and 2080 for Clark County, which are higher than the predicted shares of 23.7 and 26.8 percent for the United States.

Table 8. Population History, REMI Forecasts, and Final Rebased Forecasts

Year	REMI Forecast*	Rebased Forecast	Change in Population Rebased Forecast	Growth in Population Rebased Forecast
2022	2,384,000	2,331,934**	-1,158	-0.05%
2023	2,410,000	2,374,000	42,066	1.8%
2024	2,435,000	2,407,000	33,000	1.4%
2025	2,461,000	2,438,000	31,000	1.3%
2026	2,488,000	2,494,000	56,000	2.3%
2027	2,515,000	2,542,000	48,000	1.9%
2028	2,540,000	2,583,000	41,000	1.6%
2029	2,562,000	2,617,000	34,000	1.3%
2030	2,582,000	2,645,000	28,000	1.1%
2031	2,600,000	2,670,000	25,000	0.9%
2032	2,617,000	2,691,000	21,000	0.8%
2033	2,634,000	2,711,000	20,000	0.7%
2034	2,650,000	2,731,000	20,000	0.7%
2035	2,667,000	2,750,000	19,000	0.7%
2036	2,685,000	2,770,000	20,000	0.7%
2037	2,702,000	2,789,000	19,000	0.7%
2038	2,720,000	2,809,000	20,000	0.7%
2039	2,738,000	2,828,000	19,000	0.7%
2040	2,756,000	2,848,000	20,000	0.7%
2045	2,841,000	2,935,000	16,000	0.5%
2050	2,919,000	3,014,000	15,000	0.5%
2055	2,993,000	3,095,000	17,000	0.6%
2060	3,061,000	3,176,000	16,000	0.5%
2065	3,115,000	3,250,000	14,000	0.4%
2070	3,160,000	3,315,000	13,000	0.4%
2075	3,211,000	3,374,000	11,000	0.3%
2080	3,266,000	3,427,000	10,000	0.3%

* This forecast refers to the model prior to recalibration.
** Southern Nevada consensus population estimate.
Note: A table detailing the rebased population forecast appears in Appendix C–Table C2.

Figure 8.   Population Growth Rate Forecasts: Clark County vs. United States
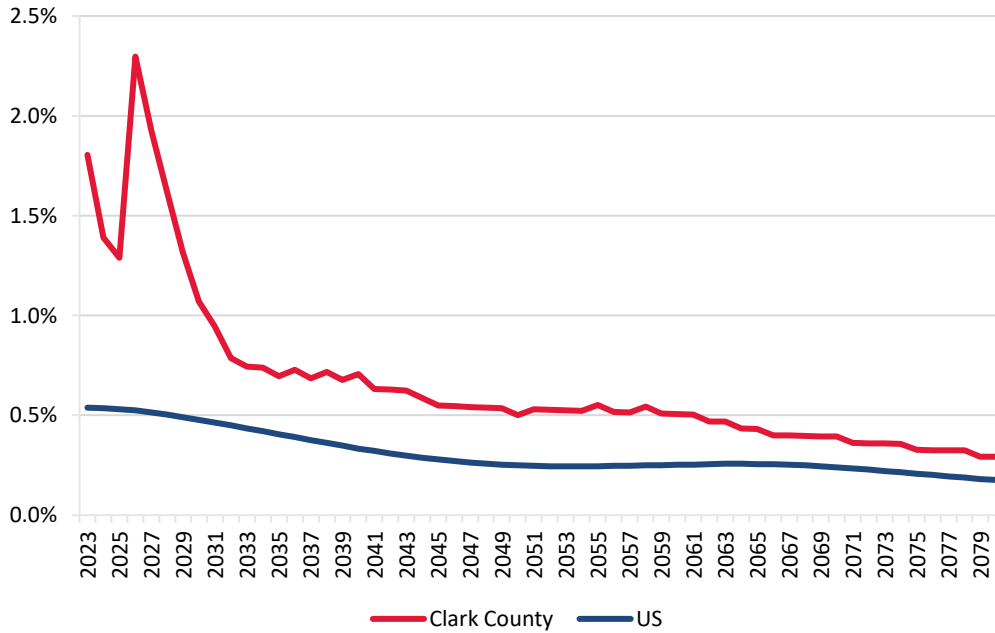
Note: Forecasts refer to the model after recalibration.

B.   Employment

The forecast predicts a continued robust economic expansion for Southern Nevada in 2023. CBER forecasts that the Las Vegas economy will experience a gain of 45,000 jobs or 3.0 percent of total jobs in 2023. See Table 9.[11] CBER forecasts that employment will grow at a slower pace in 2024, only rising by 0.7 percent, and will have a robust increase of 1.4 percent in 2025, largely boosted by about 5,300 new rooms from newly opened hotels in Clark County. The employment growth rate then will gradually decrease until 2030 and experience a slight negative growth of 0.1 percent in 2030. The negative employment growth forecast in 2030 is largely due to a weak growth of 0.1 percent for the United States, which is forecasted to be caused by a decline in employment for Las Vegas' key sectors (i.e., construction, transportation and warehousing, and accommodation and food services). Clark County expects to experience a slight decline in employment in 2030 as the above-mentioned key sectors will account for more than 30 percent of Clark County employment in 2030, which is substantially higher than 18 percent for the U.S. average. The employment growth rate, however, is expected to rebound and will stabilize at around 0.4 percent.

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[11] Unadjusted employment forecasts are shown in Appendix C.

Table 9. Employment Forecasts

YEAR	EMPLOYMENT FORECAST	CHANGE IN EMPLOYMENT FORECAST	GROWTH IN EMPLOYMENT FORECAST	EMPLOYMENT-POPULATION FORECAST
2022	1,488,000	119,000	8.7%	0.64
2023	1,533,000	45,000	3.0%	0.65
2024	1,544,000	11,000	0.7%	0.64
2025	1,565,000	21,000	1.4%	0.64
2026	1,577,000	12,000	0.8%	0.63
2027	1,586,000	9,000	0.6%	0.62
2028	1,593,000	7,000	0.4%	0.62
2029	1,594,000	1,000	0.1%	0.61
2030	1,593,000	-1,000	-0.1%	0.60
2031	1,597,000	4,000	0.3%	0.60
2032	1,601,000	4,000	0.3%	0.59
2033	1,606,000	5,000	0.3%	0.59
2034	1,612,000	6,000	0.4%	0.59
2035	1,620,000	8,000	0.5%	0.59
2036	1,629,000	9,000	0.6%	0.59
2037	1,638,000	9,000	0.6%	0.59
2038	1,648,000	10,000	0.6%	0.59
2039	1,657,000	9,000	0.5%	0.59
2040	1,666,000	9,000	0.5%	0.58
2045	1,708,000	9,000	0.5%	0.58
2050	1,758,000	10,000	0.6%	0.58
2055	1,805,000	9,000	0.5%	0.58
2060	1,848,000	8,000	0.4%	0.58
2065	1,882,000	5,000	0.3%	0.58
2070	1,916,000	7,000	0.4%	0.58
2075	1,951,000	7,000	0.4%	0.58
2080	1,988,000	8,000	0.4%	0.58

C.   Gross domestic product

Real gross domestic product (GDP) is defined as the (constant) dollar value of all final goods and services sold in a regional economy over a given time period. As such, it reflects the output of a local economy and avoids double-counting raw materials and intermediate goods in the final output. The forecast for growth

in Clark County's real GDP, shown in Table 10, basically mirrors the growth pattern of local employment, although the real GDP growth rate forecasts show stronger projections due to increasing labor productivity as well as an aging population. The real GDP growth rate forecast expects a sturdy gain of 3.4 in 2023 as the local economy expects to continue its robust expansion. After hitting the lowest growth rate of 1.5 percent in 2030, the local economy expects to have a stabilized growth rate with a matured economy of between 1.6 and 1.8 percent from 2039 to 2080.

Table 10. Gross Domestic Product Forecasts (Billions of Fixed 2023 Dollar)

YEAR	GDP FORECAST	CHANGE IN GDP FORECAST	GROWTH IN GDP FORECAST	GDP PER CAPITA FORECAST ($)
2022	164.08	8.81	5.7%	70,361
2023	169.66	5.58	3.4%	71,467
2024	171.91	2.25	1.3%	71,416
2025	176.85	4.94	2.9%	72,527
2026	181.02	4.16	2.4%	72,582
2027	184.85	3.83	2.1%	72,716
2028	188.41	3.56	1.9%	72,936
2029	191.41	3.00	1.6%	73,135
2030	194.31	2.89	1.5%	73,450
2031	197.70	3.39	1.7%	74,055
2032	201.21	3.51	1.8%	74,761
2033	204.83	3.62	1.8%	75,547
2034	208.67	3.84	1.9%	76,416
2035	212.70	4.03	1.9%	77,338
2036	216.86	4.16	2.0%	78,291
2037	221.11	4.25	2.0%	79,268
2038	225.26	4.15	1.9%	80,189
2039	229.42	4.16	1.8%	81,112
2040	233.63	4.21	1.8%	82,048
2045	255.26	4.42	1.8%	86,965
2050	278.78	4.88	1.8%	92,481
2055	304.66	5.38	1.8%	98,449
2060	332.68	5.76	1.8%	104,743
2065	361.87	5.84	1.6%	111,347
2070	393.07	5.91	1.7%	118,580
2075	427.49	5.81	1.7%	126,694

| 2080 | 464.99 | 6.34 | 1.7% | 135,668 |

Note: The forecasts refer to the model after recalibration

V.   Comparing the Current Forecast with Forecasts of Previous Years

This section compares this year's final population growth-rate forecast with the final population growth-rate forecasts from previous years. This exercise assesses the consistency of the forecast methodology and examines the variability in the population growth-rate forecasts over the last six years.

Figure 9. Clark County Historical Population Growth Rate Forecasts: 2023-2035
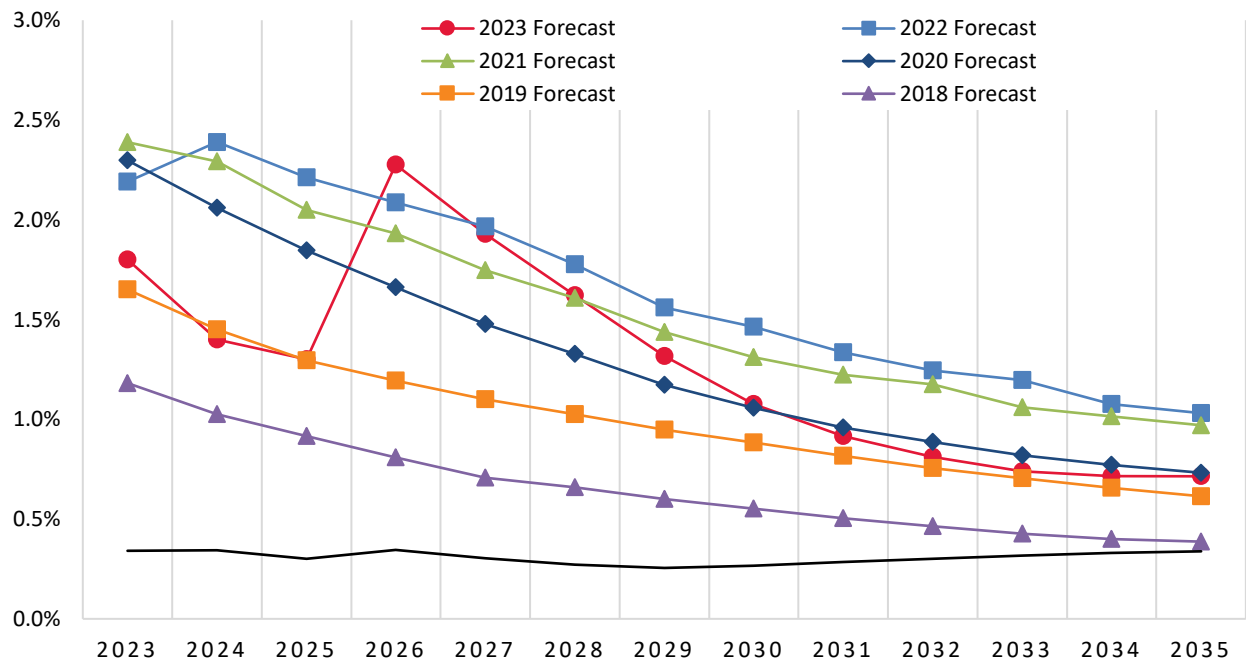
        Figure 9 shows the population growth-rate forecasts generated from the 2018 to 2023 population forecast analyses as well as the standard deviation of the population-growth-rate forecasts in the last 23 years of forecasts (2001-2023).[12,13] The 2023 forecast mirrors the 2019 forecast from 2023 and 2025 but jumps in 2026 to the highest rate among the forecasts. The 2023 forecast, however, declines at a fast pace until 2031 and then at a decreasing pace after 2031. Overall, the 2023 forecast falls between the 2018 forecast and the 2022 forecast except for 2026. Each forecast follows a downward trend keeping the same order based on magnitude except for the 2023 forecast. The range of the forecasts is from 1.1 to 2.3

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[12] Figure 9 shows the forecasts of the population growth rate from 2023 through 2035 for six different forecast years, 2018 to 2023. The standard deviation calculation uses forecasts from 23 forecast years, 2001 to 2023. So, the standard deviation in 2023 measures the variability across the 23 different forecasts for the population growth rate in 2023.

[13] The standard deviation measures the variability among data points. For data that follow a normal distribution, around 95 percent of data points will fall within approximately two standard deviations of the mean.

percent in 2023 but narrows to 0.3 to 1.2 percent in 2035. The population growth rate forecasts exhibit a similar level of variability from 2022 to 2035. Overall, the standard deviation of the population growth-rate forecast remains around 0.3 percent from 2023 to 2035. By 2030, the average of the forecasted growth rates converges to about 1.2 percent. Our forecasts tell a consistent story across different forecast years. This consistency improves as one moves to longer-term forecast values. Since the objective of this exercise is to provide primarily long-run planning guidance, the long-term growth predictions obtained during the last 23 years seem to meet that objective. Further analysis and findings appear in Appendix C from the previous report, the *2022-2060 CBER Population Forecasts.*[14]

VI.   Risks to the Forecast

Our Southern Nevada population forecast rests on economic and demographic models embedded in the structural model for Clark County as produced by REMI. This structure provides long-term forecasts that exclude the noise that one finds in time-series data–that is, business-cycle, seasonal, and irregular events. In addition, the uncertainty of the forecasts rises further into the future that the forecasts extend. For example, forecasts of population growth for the next two years see a much smaller range over which the forecast may actually vary than the range for our forecasts 40 years into the future.[15]

The main risks to the population forecasts arise from short-term fluctuations in both U.S. and Southern Nevada economic conditions. The U.S. economy has slowed recently with higher interest rates as the Fed has been raising the federal funds rate to combat high inflation. The labor market, however, remains strong while the most recent uptick in initial claims and reduction in job openings may signal a loosening of the labor market. Consumer sentiment also declined recently with increasing concerns of a recession. Moreover, the IMF projects that the World economy will experience the lowest growth since 1990 at around 3 percent over the next five years. The local economy has shown a robust expansion benefiting from the tourism sector's strong performance. The majority of Clark County visitors, however,

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[14] https://cber.unlv.edu/wp-content/uploads/2022/07/2022-CBER-Population-Forecasts.pdf.

[15] The discussions in this and the immediate prior paragraphs may seem inconsistent. The discussion, however, focuses on two different issues. In the current paragraph, the uncertainty focuses on the range around an existing forecast within which we can expect the actual value to lie with some probability. For example, a typical range covers 95 percent of actual outcomes. In a statistical sense, the discussion involves confidence bands. The further into the future that the researcher tries to forecast, the larger the range of the confidence bands needs to be to capture 95 percent of potential outcomes. In the prior paragraph, the standard deviation came from a series of different vintage REMI forecasts. The economic and demographic structure of the REMI model leads to convergence over time. That is, the economic migrants respond to economic incentives. Then, the movement of economic migrants will tend to reduce and eliminate the economic incentive for more migrants to move in the longer run. That is, excessive growth relative to national growth disappears as the incentives for economic migration diminish.

come from the United States; therefore, the current ongoing uncertainty could be a headwind in the future for the Southern Nevada economy.

This forecast contains uncertainties related to assumptions incorporated in the modeling as well as policy uncertainties not reflected in the forecast. For example, the growing water scarcity across the Western United States due to persistent drought conditions since the early 2000s has caused water managers to plan for how water will be used in the future. Policies used to optimize water use may indirectly affect local conditions that directly affect the population forecast. Additional uncertainty reflects what some call potential shortages of "developable" land parcels. The extent and impact of such shortages is unknown but may cause limitations on living space and higher prices for the existing population and potential in-migrants, which could be a headwind for future population growth.

The future diversification of the local economy may provide a positive upside risk in terms of long-term population growth. In a Brookings Institution report,[16] Las Vegas ranked 50th out of 56 very large metro areas based on improvement in prosperity (changes in productivity, average wealth and income, and standard of living). The report emphasizes that high-tech-, research-, and capital-intensive-based economies grow faster than regions that rely on the hospitality and retail sectors for their economic growth. Washoe County, however, partly succeeded in diversifying its economy after the Great Recession and posted fewer vulnerabilities due to the COVID-19 recession compared to Clark County. The Las Vegas-Henderson-Paradise metro area experienced -2.1, 14.6, and 2.4 percent growth in productivity, average annual wage, and standard of living from 2011 to 2021, while Reno gained by 10.8, 24.9, and 23.4 percent, respectively, during the same period.

In summary, although the CBER population forecast is sound, risks exist that could lead to either over- or under-forecasted population growth. CBER believes that the downside risk may exceed the upside risk for the Southern Nevada economy with the ongoing economic uncertainty, which means that the risk of overestimating population growth may exceed the risk of its underestimation in the near term. We reiterate that our long-term forecasts exclude business-cycle, seasonal, and irregular events, which respond more to these short-run risks. Our long-term forecasts are designed to aid in the process of long-term planning.

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[16] Source: The Brookings Institution (2023), *Metro Monitor*. https://www.brookings.edu/interactives/metro-monitor-2023/.

VII.   Conclusion

The latest REMI model projects long-term population growth patterns that are consistent with previous population forecasts except for 2023, 2024, and 2025. The short-term population growth forecasts from 2023 to 2025 are from CBER's 2023 *Spring Economic Outlook*. Overall, the population forecast is lower than last year's forecast over the forecast horizon, which extends through 2060. This year, however, we provide the forecasts throughout 2080 as the model offers extended years in the forecast horizon. The lower forecasts reflect not only the out-of-box forecast differences between this year's and last year's REMI models but also the new data incorporated into the model and major adjustments with current employment and population data. As mentioned in Section II, the out-of-the-box forecasted population for this year's model is lower than that of the previous year's model from 2028 to 2060, and the gap is about 41,000 in the year 2060 We note that despite short-term economic uncertainties and model difficulties, the long-term population forecast, which is our primary focus in this forecasting exercise, remains consistent with past forecasts. By 2040, we predict that Clark County's population will reach about 2.85 million. In 2080, Clark County is expected to hit slightly below 3.43 million residents.

<div align="center">**Appendices:**</div>

Appendix A: Computation of the Weighted Jobs-to-Room Ratio

The adjustment for new hotel construction uses a ratio of jobs to rooms. Two issues arise in the computation of the jobs-to-room ratio. First, we expect new hotel rooms to create new jobs in hotel services. The hotel service jobs, however, will be calculated for casinos and non-casinos separately as they have different job-to-room ratios. Second, new hotel rooms themselves will also generate economic activity and, hence, additional jobs in other sectors. Increased tourism activity from new hotel rooms will increase the demand for food services and other tourism-related industries. Therefore, we need an approach that accounts for these two issues. We suggest using a weighted ratio with the share of new hotel room for casinos and non-casinos. We propose the following formula:

Weighted jobs-to-room ratio	=	Share of new room for casinos	×	Jobs-to-room ratio for casino accommodation
	+	Share of new room for non-casinos	×	Jobs-to-room ratio for non-casino accommodation
	+	Jobs-to-room ratio for tourism-related industries		

where,

Jobs-to-room ratio for casino accommodation	=	Casino employment	÷	NGCB Casino room count		
Jobs-to-room ratio for non casino accommodation	=	Non-casino employment	÷	LVCVA room count	−	NGCB Casino room count
Jobs-to-room ratio for tourism-related industries	=	Employment due to tourism for tourism-related industries	÷	LVCVA room count		

where,

Employment due to tourism for tourism-related industries	=	Employment in tourism-related industries	×	Share of employment due to tourism

Note: NGCB stands for the Nevada Gaming Control Board.

Table A1. Computation of Jobs-to-Room Ratios by Sequence (1) – (6)

(1) Employment (thousands)

Industrial Classification	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Casino accommodation	152.4	152.4	157.6	156.0	153.2	151.9	151.2	149.1	97.2	107.5
Non-casino accommodation	12.2	12.6	13.0	12.9	13.2	13.6	13.8	14.3	9.0	9.5
Clothing and clothing accessories	18.3	18.5	19.0	19.2	18.5	19.3	19.0	18.5	13.2	15.0
Transit, ground pass transportation	13.3	13.4	14.0	14.2	13.4	12.4	11.0	9.9	6.0	6.6
Arts, entertainment, and recreation	17.5	17.8	18.7	19.3	20.5	21.3	22.6	23.5	17.2	21.2
Food service and drinking places	79.4	84.5	89.3	94.1	98.8	101.9	103.5	106.6	83.2	99.8

Note: Non-casino accommodation is equal to accommodation minus casino accommodation
Source: Quarterly Census of Employment and Wages, U.S. Bureau of Labor Statistics

(2) Proportion of employment due to tourism (=(Location quotient**-1)/Location quotient)*

Industrial Classification	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Accommodation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Non-casino accommodation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Clothing and clothing accessories	0.50	0.50	0.51	0.52	0.49	0.49	0.49	0.49	0.50	0.51
Transit, ground pass transportation	0.79	0.78	0.78	0.77	0.75	0.73	0.69	0.64	0.60	0.60
Arts, entertainment, and recreation	0.26	0.25	0.24	0.23	0.24	0.24	0.25	0.25	0.32	0.34
Food service and drinking places	0.18	0.19	0.19	0.20	0.20	0.19	0.18	0.18	0.22	0.25

* Maximum value = 1. Minimum value = 0.
** The Location Quotient (LQ) compares Clark County's employment in a given industry sector to that of the nation. An LQ greater than 1 indicates that the area has proportionately more workers than the nation employed in that specific industry sector. This implies that the area is producing more than is consumed by its residents.
Note: We subtract 1/LQ from LQ, which represents the share of the employment, regardless of tourism, for the selected industries. For the accommodation sector, the proportion is 1 as we estimate the employment due to a hotel room.

(3) Employment due to tourism (thousands) = (1) x (2)

Industrial Classification	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Accommodation	152.4	152.4	157.6	156.0	153.2	151.9	151.2	149.1	97.2	107.5
Non-casino accommodation	12.2	12.6	13.0	12.9	13.2	13.6	13.8	14.3	9.0	9.5
Total for tourism-related industries*	38.6	40.6	42.6	43.8	43.7	43.5	41.0	40.4	33.7	43.6
Clothing and clothing accessories	9.2	9.3	9.7	9.9	9.1	9.5	9.2	9.0	6.7	7.7
Transit, ground pass transportation	10.5	10.5	10.9	11.0	10.1	9.0	7.6	6.4	3.6	3.9
Arts, entertainment, and recreation	4.6	4.4	4.5	4.5	5.0	5.1	5.6	5.8	5.5	7.3
Food service and drinking places	14.3	16.4	17.4	18.4	19.5	19.8	18.5	19.2	17.9	24.7

* The sum of employment due to tourism for clothing and clothing accessories, transit, ground pass transportation, arts, entertainment, and recreation, and food service and drinking places employment due to tourism. The numbers may not sum to the total because of rounding.

(4) Hotel room count (thousands)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
LVCVA room inventory	150.5	150.1	150.1	149.6	148.7	147.3	147.4	148.9	137.4	148.3
NGCB casino room inventory	123.5	123.4	123.3	123.5	122.4	121.8	121.4	119.7	94.5	115.8
Non-casino room inventory	27.0	26.7	26.8	26.2	26.3	25.5	26.0	29.1	43.0	32.6

Note: Room inventory is the average from January to December. Non-casino room inventory is equal to LVCVA room inventory minus NGCB casino room inventory.
Source: LVCVA; NGCB; CBER

(5) Employment due to a hotel room = (3)/(4)

	2012	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Average**
Jobs-to-room ratio for Casino	1.23	1.23	1.28	1.26	1.25	1.25	1.25	1.25	1.03	0.93	**1.20**
Jobs-to-room ratio for non-casino	0.45	0.47	0.48	0.49	0.50	0.53	0.53	0.49	0.21	0.29	**0.45**
Jobs-to-room ratio for tourism-related industries	0.26	0.27	0.28	0.29	0.29	0.30	0.28	0.27	0.25	0.29	**0.28**

*Averaged jobs-to-room ratio from 2012 to 2021.
Note: Check the formulas for more detailed information.

(6) Weighted job-to-room ratio

	Casino	*Non-casino*
Share of new rooms (see appendix B)	0.611	0.389
Job-to-room ratio for accommodation	1.20	0.45
Jobs-to-room ratio for tourism-related industries	0.28	0.28

Therefore, the weighted job-to-room ratio = 0.611*1.20 +0.389*0.45 + 0.28 = 0.73+0.18+0.28 = 1.19 ~**1.2**.

Appendix B: Hotel/Motel Room Construction

Table B1. **Expected Hotel/Motel Room Construction from 2023 to 2025**

Complete Year	Hotel Name	Zip Code	Hotel Rooms	Casino Y or N
2023	Aloft Hotel	89044	136	N
2023	SpringHill Suites Las Vegas Airport	89118	127	N
2023	Home2Suites by Hilton	89113	120	N
2023	Home2Suites by Hilton	89115	120	N
2023	Delta Hotels by Marriott	89103	284	N
2023	Durango, A Station Casinos Resort	89148	211	Y
2023	Fontainebleau Las Vegas	89109	3,644	Y
2024	Element Las Vegas Airport	89119	119	N
2024	AC Hotel by Marriott	89106	322	N
2024	Element Las Vegas	89106	119	N
2024	Atwell Suites at the Pass	89015	90	N
2024	Dream Las Vegas	89119	525	Y
2025	TBD-Tilman Fertitta	89109	2,420	Y
2025	AC Hotel by Marriott	89118	225	N
2025	SpringHill Suites by Marriott	89119	170	N
2025	All Net Resort & Arena	89109	2,500	N

Note: The total number of additional rooms from 2023 to 2025 equals 11,132.
Source: Las Vegas Convention and Visitor Authority; CBER

Table B2. **Expected Casino or Non-casino Room Construction from 2023 to 2025**

Complete Year	Casino	Non-casino
2023	3,855	787
2024	525	650
2025	2,420	2,895
Total	**6,800**	**4,332**
Share of rooms	**0.611**	**0.389**

Source: Las Vegas Convention and Visitor Authority; CBER

Figure B1. Expected Hotel/Motel Room Construction Map
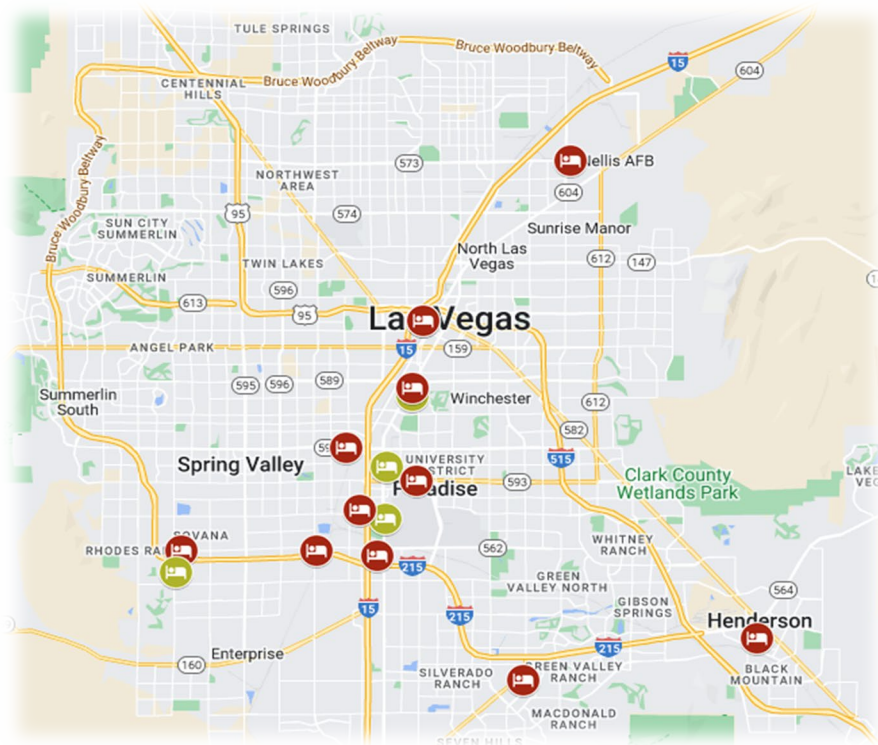
Note: The green icons in the figure represent new casino hotels, while the red icons represent non-casino hotels.
Source: Las Vegas Convention and Visitor Authority; CBER; Google Map

Appendix C: Detailed Report Tables

Table C1. Out-of-the-Box Clark County Population and Population Growth Forecasts from REMI Models LHY2020 and LHY2019

YEAR	LHY2020 POPULATION (THOUSANDS)	LHY2019 POPULATION (THOUSANDS)	LHY2020 POPULATION GROWTH	LHY2019 POPULATION GROWTH
2023	2,410	2,344	1.1%	1.3%
2024	2,435	2,388	1.0%	1.9%
2025	2,461	2,431	1.1%	1.8%
2026	2,488	2,472	1.1%	1.7%
2027	2,515	2,512	1.1%	1.6%
2028	2,540	2,549	1.0%	1.5%
2029	2,562	2,583	0.9%	1.3%
2030	2,582	2,614	0.8%	1.2%
2031	2,600	2,644	0.7%	1.1%
2032	2,617	2,671	0.7%	1.0%
2033	2,634	2,698	0.6%	1.0%
2034	2,650	2,724	0.6%	1.0%
2035	2,667	2,748	0.6%	0.9%
2036	2,685	2,772	0.7%	0.9%
2037	2,702	2,795	0.6%	0.8%
2038	2,720	2,817	0.7%	0.8%
2039	2,738	2,838	0.7%	0.7%
2040	2,756	2,859	0.7%	0.7%
2045	2,841	2,948	0.6%	0.4%
2050	2,919	3,017	0.5%	0.3%
2055	2,993	3,067	0.5%	0.2%
2060	3,061	3,103	0.4%	0.2%
2065	3,115		0.3%	
2070	3,160		0.3%	
2075	3,211		0.3%	
2080	3,266		0.3%	

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

Table C2.   Detailed Final Clark County Population Forecast: 2015 – 2080

YEAR	POPULATION FORECAST	CHANGE IN POPULATION FORECAST	GROWTH IN POPULATION (PERCENT)
2015	2,147,641*	45,403	2.2%
2016	2,205,207*	57,566	2.7%
2017	2,248,390*	43,183	2.0%
2018	2,284,616*	36,226	1.6%
2019	2,325,798*	41,182	1.8%
2020	2,376,683*	50,885	2.2%
2021	2,333,092*	-43,591	-1.8%
2022	2,331,934*	-1,158	-0.05%
2023	2,374,000**	42,066	1.8%
2024	2,407,000**	33,000	1.4%
2025	2,438,000**	31,000	1.3%
2026	2,494,000	56,000	2.3%
2027	2,542,000	48,000	1.9%
2028	2,583,000	41,000	1.6%
2029	2,617,000	34,000	1.3%
2030	2,645,000	28,000	1.1%
2031	2,670,000	25,000	0.9%
2032	2,691,000	21,000	0.8%
2033	2,711,000	20,000	0.7%
2034	2,731,000	20,000	0.7%
2035	2,750,000	19,000	0.7%
2036	2,770,000	20,000	0.7%
2037	2,789,000	19,000	0.7%
2038	2,809,000	20,000	0.7%
2039	2,828,000	19,000	0.7%
2040	2,848,000	20,000	0.7%
2041	2,866,000	18,000	0.6%
2042	2,884,000	18,000	0.6%
2043	2,902,000	18,000	0.6%
2044	2,919,000	17,000	0.6%
2045	2,935,000	16,000	0.5%
2046	2,951,000	16,000	0.5%
2047	2,967,000	16,000	0.5%
2048	2,983,000	16,000	0.5%
2049	2,999,000	16,000	0.5%
2050	3,014,000	15,000	0.5%
2051	3,030,000	16,000	0.5%
2052	3,046,000	16,000	0.5%
2053	3,062,000	16,000	0.5%
2054	3,078,000	16,000	0.5%
2055	3,095,000	17,000	0.6%
2056	3,111,000	16,000	0.5%
2057	3,127,000	16,000	0.5%
2058	3,144,000	17,000	0.5%
2059	3,160,000	16,000	0.5%
2060	3,176,000	16,000	0.5%
2061	3,192,000	16,000	0.5%

2062	3,207,000	15,000	0.5%
2063	3,222,000	15,000	0.5%
2064	3,236,000	14,000	0.4%
2065	3,250,000	14,000	0.4%
2066	3,263,000	13,000	0.4%
2067	3,276,000	13,000	0.4%
2068	3,289,000	13,000	0.4%
2069	3,302,000	13,000	0.4%
2070	3,315,000	13,000	0.4%
2071	3,327,000	12,000	0.4%
2072	3,339,000	12,000	0.4%
2073	3,351,000	12,000	0.4%
2074	3,363,000	12,000	0.4%
2075	3,374,000	11,000	0.3%
2076	3,385,000	11,000	0.3%
2077	3,396,000	11,000	0.3%
2078	3,407,000	11,000	0.3%
2079	3,417,000	10,000	0.3%
2080	3,427,000	10,000	0.3%

* SNRPC consensus population estimate.
**CBER 2023 Economic Outlook forecast, April 2023
Note: The average annual forecasted growth rate is 0.7 percent.

Table C3.   Economic Forecast

Variable	Unit	2023	2024	2025	2026	2027	2028	2029	2030	2035
Total Employment	Thousands (Jobs)	1533.35	1543.76	1564.79	1577.14	1586.36	1593.35	1594.41	1593.48	1619.70
Private Non-Farm Employment	Thousands (Jobs)	1407.63	1417.00	1436.55	1447.62	1455.71	1461.69	1461.98	1460.40	1484.06
Residence-Adjusted Employment	Thousands	1510.64	1521.08	1542.03	1554.58	1564.14	1571.44	1572.87	1572.34	1599.68
Population	Thousands	2373.92	2407.15	2438.44	2493.96	2542.05	2583.24	2617.26	2645.42	2750.19
Labor Force	Thousands	1183.35	1199.17	1213.58	1240.59	1263.59	1283.28	1299.42	1311.50	1357.48
Gross Domestic Product	Billions of Fixed (2023) $	169.66	171.91	176.85	181.02	184.85	188.41	191.41	194.31	212.70
Output	Billions of Fixed (2023) $	279.18	282.29	289.59	295.56	300.80	305.48	309.09	312.36	338.66
Value Added	Billions of Fixed (2023) $	169.66	171.91	176.85	181.02	184.85	188.41	191.41	194.31	212.70
Personal Income	Billions of Fixed (2023) $	143.90	144.20	149.04	153.74	158.56	164.05	167.13	171.89	193.01
Disposable Personal Income	Billions of Fixed (2023) $	126.77	127.11	131.34	134.23	137.62	142.81	145.53	149.95	168.57
PCE-Price Index	2012=100 (Nation)	125.98	128.84	131.70	134.66	137.58	140.49	143.38	146.26	161.15

Variable	Unit	2040	2045	2050	2055	2060	2065	2070	2075	2080
Total Employment	Thousands (Jobs)	1665.50	1708.08	1757.73	1805.05	1848.23	1882.39	1915.66	1951.25	1988.02
Private Non-Farm Employment	Thousands (Jobs)	1527.25	1567.20	1613.93	1658.72	1699.85	1732.71	1764.97	1799.57	1835.39
Residence-Adjusted Employment	Thousands	1645.61	1688.20	1737.77	1785.08	1828.35	1862.76	1896.19	1931.88	1968.76
Population	Thousands	2847.50	2935.24	3014.41	3094.60	3176.18	3249.94	3314.79	3374.19	3427.43
Labor Force	Thousands	1402.98	1445.19	1484.93	1524.59	1566.74	1606.52	1640.00	1672.19	1702.09
Gross Domestic Product	Billions of Fixed (2023) $	233.63	255.26	278.78	304.66	332.68	361.87	393.07	427.49	464.99
Output	Billions of Fixed (2023) $	373.88	411.33	452.00	496.69	545.02	595.34	648.98	707.97	772.04
Value Added	Billions of Fixed (2023) $	233.63	255.26	278.78	304.66	332.68	361.87	393.07	427.49	464.99
Personal Income	Billions of Fixed (2023) $	216.85	242.03	269.61	300.07	333.17	366.95	403.59	445.11	490.89
Disposable Personal Income	Billions of Fixed (2023) $	189.39	211.39	235.50	262.13	291.07	320.57	352.57	388.90	428.98
PCE-Price Index	2012=100 (Nation)	177.86	196.36	216.80	239.40	264.32	291.74	322.01	355.60	392.83

Table C4.   Employment (in thousands)

Variable	2023	2024	2025	2026	2027	2028	2029	2030	2035
Private Non-Farm	1407.63	1417.00	1436.55	1447.62	1455.71	1461.69	1461.98	1460.40	1484.06
Forestry, Fishing, Other	0.54	0.56	0.59	0.60	0.61	0.61	0.61	0.60	0.66
Mining	1.78	1.79	1.80	1.83	1.84	1.84	1.84	1.83	1.82
Utilities	3.05	3.02	3.02	3.01	2.99	2.97	2.93	2.90	2.79
Construction	101.84	103.53	105.50	107.90	107.96	107.83	106.75	105.37	102.35
Manufacturing	32.13	31.60	31.25	31.42	31.69	31.96	32.32	32.87	35.34
Wholesale Trade	32.02	31.79	31.83	31.87	31.94	32.01	32.05	32.16	32.49
Retail Trade	138.60	136.13	135.07	133.92	133.18	132.79	132.40	132.47	133.79
Transportation and Warehousing	117.76	118.89	120.20	121.29	122.26	122.92	123.07	122.90	125.04
Information	16.80	16.71	16.69	16.64	16.61	16.57	16.50	16.42	16.33
Finance and Insurance	86.02	86.04	86.46	86.58	86.68	86.74	86.57	86.34	87.26
Real Estate and Rental and Leasing	90.27	91.07	92.43	93.35	94.18	94.83	95.08	95.23	97.96
Professional and Technical Services	87.96	88.76	89.95	90.84	91.75	92.48	92.97	93.43	96.90
Management of Companies and Enterprises	31.15	30.89	30.62	30.42	30.30	30.16	30.02	29.90	29.95
Admin and Waste Services	120.72	121.89	123.81	125.28	126.72	127.97	128.84	129.61	136.17
Educational Services	18.41	18.76	19.16	19.45	19.70	19.88	19.94	19.95	20.94
Health Care and Social Assistance	130.05	131.84	134.55	136.53	138.22	139.73	140.59	141.33	147.14
Arts, Entertainment, and Recreation	49.07	50.61	52.15	53.40	54.52	55.39	55.88	56.05	57.06
Accommodation and Food Services	274.01	276.62	283.43	284.35	285.07	285.24	284.21	282.24	281.19
Other Services (except public administration)	75.47	76.50	78.05	78.96	79.51	79.76	79.41	78.80	78.89
Government	125.28	126.34	127.81	129.10	130.24	131.25	132.01	132.66	135.20
State and local	93.40	94.75	96.39	97.85	99.06	100.01	100.64	101.03	102.78
Federal civilian	14.80	14.55	14.37	14.21	14.12	14.13	14.24	14.46	15.28
Federal military	17.08	17.04	17.05	17.05	17.06	17.10	17.14	17.17	17.13
Farm	0.43	0.43	0.42	0.42	0.42	0.42	0.42	0.42	0.43

Table C4.   Employment (in thousands) (continued)

Variable	2040	2045	2050	2055	2060	2065	2070	2075	2080
Private Non-Farm	1527.25	1567.20	1613.93	1658.72	1699.85	1732.71	1764.97	1799.57	1835.39
Forestry, Fishing, Other	0.72	0.75	0.79	0.81	0.83	0.84	0.83	0.83	0.81
Mining	1.84	1.87	1.91	1.94	1.98	2.00	2.02	2.05	2.07
Utilities	2.70	2.59	2.48	2.37	2.26	2.13	1.99	1.87	1.75
Construction	104.53	107.03	109.86	112.97	115.91	118.00	120.58	123.87	127.35
Manufacturing	38.07	40.41	43.03	45.99	49.14	52.20	55.28	58.50	61.83
Wholesale Trade	33.18	33.78	34.43	34.94	35.27	35.29	35.22	35.13	34.99
Retail Trade	137.94	141.76	146.17	150.26	153.75	156.04	158.07	160.22	162.30
Transportation and Warehousing	129.62	133.94	138.78	143.33	147.55	151.17	154.62	158.14	161.68
Information	16.49	16.69	17.00	17.30	17.58	17.81	18.01	18.23	18.45
Finance and Insurance	88.16	88.49	88.97	89.10	88.86	88.11	87.29	86.53	85.82
Real Estate and Rental and Leasing	101.25	103.98	106.90	109.50	111.60	112.82	113.77	114.78	115.80
Professional and Technical Services	100.91	104.87	109.40	113.90	118.30	122.33	126.34	130.60	135.07
Management of Companies and Enterprises	30.35	30.68	31.07	31.36	31.53	31.60	31.58	31.51	31.41
Admin and Waste Services	144.29	152.24	160.94	169.51	177.81	185.40	192.92	200.68	208.62
Educational Services	22.34	23.64	25.06	26.55	27.99	29.33	30.71	32.10	33.50
Health Care and Social Assistance	153.16	158.25	163.75	168.52	172.65	175.49	178.13	180.85	183.60
Arts, Entertainment, and Recreation	59.32	61.59	64.21	66.78	69.27	71.57	73.86	76.21	78.62
Accommodation and Food Services	282.82	284.69	288.46	292.24	295.85	299.09	302.44	306.18	310.34
Other Services (except public administration)	79.58	79.96	80.73	81.35	81.73	81.49	81.30	81.29	81.38
Government	137.82	140.45	143.38	145.91	147.96	149.27	150.30	151.30	152.26
State and local	105.07	107.05	109.14	110.85	112.07	112.53	112.63	112.64	112.54
Federal civilian	15.76	16.52	17.42	18.36	19.33	20.35	21.45	22.61	23.85
Federal military	17.00	16.87	16.81	16.71	16.56	16.39	16.23	16.05	15.88
Farm	0.44	0.43	0.43	0.42	0.41	0.41	0.39	0.38	0.37

Table C5.   Gross Domestic Product (billions of fixed 2023$)*

Variable	2023	2024	2025	2026	2027	2028	2029	2030	2035
Personal Consumption Expenditures	123.09	123.87	127.44	130.84	134.11	137.16	139.80	142.46	159.11
Motor vehicles and parts	4.20	4.11	4.16	4.21	4.30	4.41	4.53	4.69	5.73
Furnishings and durable household equipment	3.55	3.66	3.89	4.12	4.38	4.67	4.98	5.34	6.57
Recreational goods and other durable goods	7.51	7.47	7.66	7.87	8.10	8.37	8.67	9.02	11.28
Food and beverages	9.64	9.56	9.68	9.83	10.00	10.17	10.34	10.52	11.77
Clothing and footwear	4.33	4.25	4.30	4.41	4.56	4.76	4.99	5.29	5.94
Motor vehicle fuels, lubricants, and fluids	2.01	1.93	1.87	1.84	1.82	1.76	1.71	1.67	1.51
Fuel oil and other fuels	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05
Other nondurable goods	11.17	11.28	11.66	12.04	12.43	12.81	13.17	13.54	15.90
Housing	20.55	20.56	20.96	21.33	21.68	22.00	22.23	22.44	24.20
Household utilities	2.59	2.56	2.59	2.61	2.64	2.65	2.66	2.66	2.79
Transportation services	3.86	3.91	4.03	4.14	4.24	4.32	4.38	4.42	4.76
Health care	17.79	18.08	18.76	19.39	19.99	20.56	21.05	21.53	24.49
Recreation and other services	35.83	36.42	37.83	38.97	39.91	40.63	41.05	41.28	44.12
Gross Private Domestic Fixed Investment	30.68	32.14	33.64	34.96	36.06	36.87	37.39	37.82	40.97
Residential	5.78	6.02	6.28	6.62	6.78	6.76	6.56	6.29	5.52
Nonresidential structures	4.84	5.10	5.42	5.61	5.67	5.73	5.73	5.70	5.87
Nonresidential equipment	11.54	12.12	12.70	13.16	13.67	14.10	14.48	14.86	16.86
Nonresidential intellectual property products	8.52	8.90	9.25	9.57	9.95	10.29	10.62	10.97	12.72
Change in Private Inventories	0.09	0.06	0.03	0.03	0.04	0.04	0.04	0.04	0.04
Government Consumption Expenditures	26.42	26.56	26.89	27.30	27.49	27.77	28.00	28.20	29.23
Federal military	8.86	8.82	8.84	8.86	8.88	8.91	8.94	8.97	9.09
Federal civilian	3.44	3.43	3.44	3.45	3.45	3.47	3.48	3.49	3.54
State and local government	14.11	14.31	14.62	15.00	15.16	15.39	15.58	15.75	16.60
Total Exports	87.60	88.46	90.46	91.73	93.20	94.40	95.54	96.52	104.06
Total Imports	98.22	99.18	101.61	103.84	106.05	107.83	109.35	110.74	120.71

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

Table C5.   Gross Domestic Product (billions of fixed 2023$) (continued)*

Variable	2040	2045	2050	2055	2060	2065	2070	2075	2080
Personal Consumption Expenditures	178.03	197.75	219.50	243.62	269.72	296.41	325.18	357.78	393.80
Motor vehicles and parts	7.02	8.48	10.21	12.24	14.58	17.12	20.03	23.50	27.50
Furnishings and durable household equipment	8.07	9.77	11.71	13.94	16.41	19.00	21.83	25.02	28.52
Recreational goods and other durable goods	14.05	17.19	20.87	25.12	29.92	35.10	40.92	47.64	55.19
Food and beverages	13.11	14.45	15.87	17.40	18.99	20.52	22.05	23.69	25.39
Clothing and footwear	6.65	7.40	8.22	9.12	10.07	11.02	11.98	13.02	14.14
Motor vehicle fuels, lubricants, and fluids	1.40	1.33	1.28	1.22	1.17	1.10	1.04	0.98	0.93
Fuel oil and other fuels	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Other nondurable goods	18.68	21.75	25.29	29.37	34.03	39.15	44.97	51.76	59.56
Housing	25.98	27.69	29.41	31.17	32.88	34.40	35.80	37.23	38.68
Household utilities	2.92	3.02	3.12	3.22	3.30	3.36	3.40	3.44	3.48
Transportation services	5.16	5.54	5.95	6.39	6.85	7.31	7.81	8.42	9.09
Health care	27.74	31.01	34.49	38.14	42.00	45.87	49.87	54.16	58.70
Recreation and other services	47.20	50.07	53.04	56.24	59.48	62.41	65.44	68.89	72.57
Gross Private Domestic Fixed Investment	45.69	50.66	56.09	62.18	68.86	75.90	83.39	91.78	101.00
Residential	5.61	5.53	5.45	5.47	5.52	5.41	5.53	5.92	6.34
Nonresidential structures	6.42	7.12	7.89	8.77	9.73	10.78	11.83	13.01	14.33
Nonresidential equipment	19.14	21.58	24.26	27.19	30.41	33.87	37.45	41.30	45.56
Nonresidential intellectual property products	14.53	16.44	18.50	20.74	23.20	25.84	28.58	31.54	34.77
Change in Private Inventories	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03
Government Consumption Expenditures	30.26	31.23	32.17	33.14	34.13	35.09	36.02	36.93	37.91
Federal military	9.20	9.29	9.40	9.50	9.62	9.75	9.87	9.98	10.10
Federal civilian	3.58	3.62	3.66	3.70	3.75	3.79	3.84	3.88	3.93
State and local government	17.48	18.32	19.11	19.93	20.76	21.55	22.31	23.07	23.88
Total Exports	113.79	124.08	135.32	147.46	160.77	175.27	190.53	206.79	224.32
Total Imports	134.17	148.50	164.35	181.77	200.82	220.82	242.08	265.82	292.06

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

Table C6.   Income (billions of fixed 2023$)

Variable	2023	2024	2025	2026	2027	2028	2029	2030	2035
Total earnings by place of work	103.92	104.07	107.00	109.49	112.14	114.54	116.42	117.98	127.44
Total wage and salary disbursements	76.14	76.69	79.28	81.37	83.19	84.84	86.10	87.10	93.55
Supplements to wages and salaries	16.74	16.41	16.51	16.74	17.37	17.95	18.46	18.90	20.93
Employer contributions for employee pension and insurance funds	11.13	10.92	10.98	11.14	11.55	11.94	12.28	12.57	13.92
Employer contributions for government social insurance	5.61	5.50	5.53	5.61	5.82	6.01	6.18	6.33	7.01
Proprietors' income with inventory valuation and capital consumption adjustments	11.05	10.97	11.21	11.37	11.58	11.75	11.86	11.99	12.97
Less: Contributions for government social insurance	11.94	12.05	12.43	12.79	13.03	13.25	13.43	13.59	14.63
Employee and self-employed contributions for government social insurance	6.34	6.56	6.91	7.18	7.21	7.24	7.25	7.26	7.62
Employer contributions for government social insurance	5.61	5.50	5.53	5.61	5.82	6.01	6.18	6.33	7.01
Plus: Adjustment for residence	-0.50	-0.51	-0.56	-0.58	-0.59	-0.59	-0.58	-0.55	-0.50
Gross in	2.00	1.98	2.00	2.03	2.07	2.11	2.15	2.19	2.39
Gross out	2.50	2.50	2.56	2.60	2.66	2.70	2.73	2.74	2.88
Equals: Net earnings by place of residence	91.48	91.50	94.01	96.12	98.52	100.71	102.41	103.85	112.31
Plus: Rental, personal interest, and personal dividend income	29.52	30.10	31.22	32.75	34.16	35.68	37.17	38.72	45.71
Plus: Personal current transfer receipts	22.90	22.60	23.81	24.87	25.87	27.67	27.54	29.33	34.99
Equals: Personal income	143.90	144.20	149.04	153.74	158.56	164.05	167.13	171.89	193.01
Less: Personal current taxes	17.13	17.09	17.70	19.51	20.94	21.25	21.60	21.94	24.45
Equals: Disposable personal income	126.77	127.11	131.34	134.23	137.62	142.81	145.53	149.95	168.57

Table C6.   Income (billions of fixed 2023$) (continued)

Variable	2040	2045	2050	2055	2060	2065	2070	2075	2080
Total earnings by place of work	139.02	150.87	163.61	177.37	191.79	206.08	220.56	235.50	250.18
Total wage and salary disbursements	101.38	109.29	117.76	126.89	136.46	145.94	155.51	165.36	175.00
Supplements to wages and salaries	23.30	25.76	28.38	31.21	34.19	37.15	40.12	43.14	46.07
Employer contributions for employee pension and insurance funds	15.50	17.13	18.88	20.76	22.74	24.71	26.69	28.69	30.64
Employer contributions for government social insurance	7.80	8.63	9.50	10.45	11.45	12.44	13.43	14.45	15.43
Proprietors' income with inventory valuation and capital consumption adjustments	14.34	15.82	17.47	19.26	21.14	22.99	24.93	27.00	29.11
Less: Contributions for government social insurance	15.87	17.12	18.45	19.87	21.34	22.79	24.21	25.66	27.05
Employee and self-employed contributions for government social insurance	8.07	8.50	8.95	9.42	9.90	10.34	10.78	11.21	11.62
Employer contributions for government social insurance	7.80	8.63	9.50	10.45	11.45	12.44	13.43	14.45	15.43
Plus: Adjustment for residence	-0.54	-0.61	-0.68	-0.75	-0.80	-0.82	-0.83	-0.87	-0.91
Gross in	2.57	2.77	2.98	3.20	3.45	3.73	4.00	4.28	4.56
Gross out	3.12	3.37	3.65	3.95	4.25	4.54	4.83	5.15	5.46
Equals: Net earnings by place of residence	122.61	133.14	144.48	156.75	169.64	182.49	195.52	208.97	222.22
Plus: Rental, personal interest, and personal dividend income	52.63	59.51	66.48	73.50	80.33	85.97	91.00	95.70	99.35
Plus: Personal current transfer receipts	41.62	49.38	58.65	69.82	83.20	98.50	117.07	140.44	169.32
Equals: Personal income	216.85	242.03	269.61	300.07	333.17	366.95	403.59	445.11	490.89
Less: Personal current taxes	27.46	30.63	34.11	37.94	42.10	46.38	51.01	56.21	61.91
Equals: Disposable personal income	189.39	211.39	235.50	262.13	291.07	320.57	352.57	388.90	428.98

Table C7. Population and Labor Force (in thousands)

Variable	2023	2024	2025	2026	2027	2028	2029	2030	2035
Total population	2373.92	2407.15	2438.44	2493.96	2542.05	2583.24	2617.26	2645.42	2750.19
By race and ethnicity									
White	942.00	945.74	948.49	960.33	968.87	974.38	976.82	976.77	959.89
Black	284.09	287.60	290.86	296.99	302.20	306.61	310.17	313.05	323.32
Other	368.34	375.19	381.75	392.13	401.38	409.55	416.61	422.78	448.23
Hispanic	779.48	798.62	817.34	844.51	869.60	892.71	913.66	932.83	1018.75
By age									
Ages 0-14	431.69	432.64	433.29	437.72	441.92	444.42	446.00	445.71	447.09
Ages 15-24	289.08	295.66	302.69	314.60	322.71	327.31	329.95	331.80	326.37
Ages 25-64	1251.49	1260.36	1266.47	1284.90	1301.44	1317.88	1330.75	1341.11	1385.55
Ages 65 & older	401.65	418.48	435.99	456.74	475.99	493.64	510.57	526.81	591.19
Labor force	1183.35	1199.17	1213.58	1240.59	1263.59	1283.28	1299.42	1311.50	1357.48
Labor force participation rate	0.63	0.62	0.62	0.62	0.62	0.61	0.61	0.61	0.60
Participation rates by gender									
Male (16 & older)	0.68	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.66
Female (16 & older)	0.57	0.57	0.57	0.57	0.56	0.56	0.56	0.56	0.55

Variable	2040	2045	2050	2055	2060	2065	2070	2075	2080
Total population	2847.50	2935.24	3014.41	3094.60	3176.18	3249.94	3314.79	3374.19	3427.43
By race and ethnicity									
White	936.78	909.59	881.44	856.63	835.63	815.05	794.02	773.19	752.76
Black	332.84	341.14	348.04	354.53	360.97	366.05	369.20	370.57	370.18
Other	473.69	499.12	524.20	550.05	576.34	601.51	625.59	649.40	672.81
Hispanic	1104.19	1185.39	1260.73	1333.38	1403.25	1467.34	1525.99	1581.03	1631.68
By age									
Ages 0-14	454.20	464.15	473.04	478.70	481.77	482.95	484.14	487.92	493.37
Ages 15-24	323.92	326.06	329.49	336.74	344.83	348.04	348.48	349.02	350.18
Ages 25-64	1431.30	1473.16	1500.76	1520.56	1537.33	1573.82	1599.11	1608.24	1616.58
Ages 65 & older	638.09	671.87	711.12	758.60	812.25	845.13	883.06	929.02	967.31
Labor force	1402.98	1445.19	1484.93	1524.59	1566.74	1606.52	1640.00	1672.19	1702.09
Labor force participation rate	0.60	0.60	0.60	0.59	0.59	0.59	0.59	0.59	0.59
Participation rates by gender									
Male (16 & older)	0.66	0.65	0.65	0.65	0.65	0.64	0.64	0.64	0.64
Female (16 & older)	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.55

Table C8. Demographics (in thousands)

Variable	2023	2024	2025	2026	2027	2028	2029	2030	2035
Starting population	2331.95	2373.92	2407.15	2438.44	2493.96	2542.05	2583.24	2617.26	2730.68
Births	27.22	27.39	27.50	27.78	28.16	28.45	28.66	28.80	29.19
Deaths	20.94	21.53	22.12	22.84	23.66	24.45	25.22	25.97	29.55
Natural growth	6.28	5.85	5.38	4.94	4.50	4.00	3.44	2.83	-0.35
Population before migrants	2338.23	2379.77	2412.53	2443.38	2498.46	2546.05	2586.68	2620.09	2730.33
Total migrants	35.69	27.38	25.91	50.58	43.60	37.19	30.58	25.33	19.86
Economic migrants	19.14	10.84	9.18	33.76	26.65	20.11	13.43	8.12	2.65
International migrants	10.58	10.55	10.52	10.49	10.48	10.47	10.46	10.45	10.39
Retired migrants	5.91	6.05	6.20	6.34	6.45	6.55	6.65	6.72	6.87
Special pops migrants	0.07	-0.05	0.01	-0.01	0.01	0.05	0.04	0.04	-0.05
Total population	2373.92	2407.15	2438.44	2493.96	2542.05	2583.24	2617.26	2645.42	2750.19

Variable	2040	2045	2050	2055	2060	2065	2070	2075	2080
Starting population	2828.44	2918.73	2998.71	3078.27	3160.13	3236.24	3302.05	3362.85	3417.08
Births	29.97	30.39	30.49	30.65	30.91	31.27	31.48	31.77	32.10
Deaths	32.68	35.02	36.55	37.55	38.49	39.65	41.19	42.84	44.11
Natural growth	-2.71	-4.63	-6.06	-6.90	-7.58	-8.37	-9.71	-11.07	-12.01
Population before migrants	2825.73	2914.10	2992.65	3071.37	3152.54	3227.87	3292.34	3351.79	3405.07
Total migrants	21.78	21.14	21.76	23.23	23.64	22.08	22.46	22.41	22.36
Economic migrants	4.60	3.94	4.32	5.43	5.39	3.38	3.33	2.82	2.42
International migrants	10.30	10.21	10.10	10.00	9.94	10.07	10.20	10.34	10.46
Retired migrants	6.90	7.01	7.36	7.84	8.36	8.67	8.97	9.29	9.53
Special pops migrants	-0.03	-0.02	-0.02	-0.03	-0.04	-0.04	-0.04	-0.04	-0.04
Total population	2847.50	2935.24	3014.41	3094.60	3176.18	3249.94	3314.79	3374.19	3427.43