

# 2021-2060 Population Forecasts

LONG-TERM PROJECTIONS FOR CLARK COUNTY, NEVADA

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Prepared by  
Center for Business and Economic Research

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

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## **Executive Summary**

Each year, the Regional Transportation Commission of Southern Nevada (RTC), the Southern Nevada Regional Planning Coalition (SNRPC), 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, we employ 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 local public and private investment projects. The resulting long-term forecast predicts positive population growth throughout the range of the forecast. SNRPC estimates that Clark County population was 2.38 million in 2020, a strong increase of 2.2 percent despite the COVID-19 outbreak. We expect that Clark County's population will reach approximately 3.02 million by 2035 and nearly 3.38 million by 2060.

Table 1 summarizes the population forecast. In the short term, the population in Clark County is predicted to grow strongly in the short term, boosted by the local economic recovery, at rates of 1.7, 2.2, 2.4, and 2.3 percent, respectively, in 2021, 2022, 2023, and 2024. The short-term forecasts, however, exhibit higher uncertainty due to the risks of potential viral mutations and their unpredictable effect on the continuation of the pandemic and, thus, on the future path of the economy. Despite short-term economic uncertainties and modeling difficulties, this forecast provides information for medium- to long-term planning purposes. In the medium term, the population growth rate is expected to show modest growth, but the growth rate beginning in 2024 will decline over time. In the long term, its growth rate tapers off as Clark County's maturing economy attracts fewer "net" economic and international migrants (i.e., in-migrants minus out-migrants). In addition, the population ages over time. As a result, the rate of growth, which exceeded the national average over the past 50 years, moderates and eventually moves below the national rate of growth. That is, by 2050, the population growth rate falls to marginally below the projected long-term national population growth rate.<sup>1</sup> As the Clark County economy continues to mature, the population growth stabilizes around 0.2 percent after 2056.

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<sup>1</sup> Source: <https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html>

As with any forecast, potential risks exist that could lead to either an over- or under-forecast of population and its growth rate. Since the downside risk to our employment forecast exceeds the upside risk, the risk of over-forecasting population and its growth rate exceeds the risk of under-forecasting in the near term due to the uncertainties associated with potential viral mutations and a slowing vaccination rate. That is, if the current economic recovery faces an unexpected new variant that results in large increases of cases, for example, as seen in India, that could cause a slowing of the economic recovery. The economic uncertainty for the short term remains at a high-level as we have never experienced an economic downturn caused by public health crisis. Our long-term forecasts, however, exclude business-cycle, seasonal, and irregular events, which respond to short-run risks. In summary, our forecasts primarily provide a long-term planning tool that address the trend movements in population, excluding the short-run business-cycle, seasonal, and irregular effects.

Table 1. Clark County Final Population Forecast: 2010-2060

<i>Year</i>	<i>Population Forecast</i>	<i>Change in Population Forecast</i>	<i>Growth in Population Forecast</i>
2010	1,951,269*	-55,078	-2.7%
2011	1,966,630**	15,361	0.8%
2012	2,008,654**	42,024	2.1%
2013	2,062,253**	53,599	2.7%
2014	2,102,238**	39,985	1.9%
2015	2,147,641**	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	2,417,000	40,317	1.7%
2022	2,470,000	53,000	2.2%
2023	2,529,000	59,000	2.4%
2024	2,587,000	58,000	2.3%
2025	2,640,000	53,000	2.0%
2026	2,691,000	51,000	1.9%
2027	2,738,000	47,000	1.7%
2028	2,782,000	44,000	1.6%
2029	2,822,000	40,000	1.4%
2030	2,859,000	37,000	1.3%
2031	2,894,000	35,000	1.2%
2032	2,928,000	34,000	1.2%
2033	2,959,000	31,000	1.1%
2034	2,989,000	30,000	1.0%
2035	3,018,000	29,000	1.0%
2040	3,138,000	21,000	0.7%
2045	3,228,000	16,000	0.5%
2050	3,296,000	12,000	0.4%
2055	3,345,000	9,000	0.3%
2060	3,383,000	6,000	0.2%

\*2010 U.S. Census.

\*\* SNRPC consensus population estimate.

Note: The changes and growth rates in population forecasts after 2035 are not cumulative. The forecast changes and growth rates represent the annual values. See Table C2 for the complete set of forecasts.

## TABLE OF CONTENTS

Executive Summary.....	i
I. Introduction.....	1
II. Comparison of REMI Models: Current and Previous Year .....	2
III. Recalibrating the Model.....	8
A. <i>Adjustment of the national economic forecast</i> .....	8
B. <i>Rebasing the population forecast</i> .....	9
C. <i>Employment adjustment</i> .....	9
D. <i>Hotel room adjustment</i> .....	13
E. <i>Transportation and infrastructure improvements</i> .....	15
IV. Analysis of the Economic and Demographic Forecast .....	16
A. <i>Population</i> .....	17
B. <i>Employment</i> .....	19
C. <i>Gross domestic product</i> .....	20
V. Comparing the Current Forecast with Forecasts of Previous Years.....	21
VI. Risks to the Forecast .....	22
VII. Conclusion .....	24
Appendices:.....	25
Appendix A: Computation of the Jobs-to-Room Ratio .....	25
Appendix B: Hotel/Motel Room Construction .....	27
Appendix C: Detailed Report Tables.....	28

**LIST OF TABLES**

Table 1. Clark County Final Population Forecast: 2010-2060 .....	iii
Table 2. Clark County REMI Out-of-the-Box Forecast Comparison: LHY2018 and LHY2017 .....	7
Table 3. Clark County Employment Levels (in 000s) before and after BEA Adjustment for 2019 .....	10
Table 4. Employment Growth Rates for Clark County before DETR Adjustment for 2020.....	11
Table 5. Model Job Adjustments (in 000s) for 2019 and 2020 .....	12
Table 6. Expected Additional Employment due to New Rooms: Projections for 2021-2025 .....	14
Table 7. Population History, REMI Forecasts, and Final Rebased Forecasts.....	17
Table 8. Employment Forecasts .....	19
Table 9. Gross Domestic Product Forecasts (Billions of Fixed 2021 Dollar).....	20
Table A1. Computation of the Jobs-to-Room Ratio by Sequence (1) – (5) .....	25
Table B1. Expected Hotel/Motel Room Construction from 2021 and 2025 .....	27
Table C1. Out-of-the-Box Clark County Population and Population Growth Forecasts from REMI Models LHY2018 and LHY2017.....	28
Table C2. Detailed Final Clark County Population Forecast: 2010-2060.....	29
Table C3. Economic Forecast.....	30
Table C4. Employment (in thousands) .....	31
Table C5. Gross Domestic Product (billions of fixed 2021 \$) .....	33
Table C6. Income (billions of fixed 2021 \$) .....	35
Table C7. Population and Labor Force (in thousands) .....	37
Table C8. Demographics (in thousands).....	38

## LIST OF FIGURES

Figure 1. Clark County Population Forecasts: REMI Out-of-the-Box LHY2018 and LHY2017: 2021-2060 .....	4
Figure 2. Clark County Population-Growth-Rate Forecasts: REMI Out-of-the-Box LHY2018 and LHY2017: 2021-2060 .....	5
Figure 3. Clark County Net Migrant and Net Economic Migrant Forecasts: REMI Out-of-the-Box LHY2018 and LHY2017: 2021-2060.....	5
Figure 4. Clark County Net International Migrant Forecasts: REMI Out-of-the-Box LHY2018 and LHY2017: 2021-2060 .....	6
Figure 5. U.S. real GDP Forecasts: RSQE vs. REMI Out-of-the-Box from 2020 to 2022 .....	8
Figure 6. The Estimated Federal Funding Allocation for the Regional Transportation Plan for Southern Nevada 2021-2050 .....	16
Figure 7. Share of Clark County International Migration, Total Births, and Total Deaths .....	18
Figure 8. Clark County Historical Population-Growth-Rate Forecasts: 2021-2035 .....	21
Figure B1. Expected Hotel/Motel Room Construction by Area from 2021 and 2025.....	27



## Acknowledgements

CBER thanks the members of the Population Forecasting Group for comments on earlier versions of this report.

## I. Introduction

Each year, the Regional Transportation Commission (RTC), the Southern Nevada Regional Planning Coalition (SNRPC), 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, we employ a general-equilibrium demographic and economic model developed by Regional Economic Models, Inc. (REMI), specifically for Clark County.

The REMI model is a state-of-the-art econometric forecasting model that accounts for dynamic 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 local capital projects.

The model employed divides Nevada into five regions: Clark County; Nye County; Lincoln County; Washoe County; and the remaining counties, which are combined to form a fifth region. These regions are modeled using the U.S. economy as a backdrop. The model contains over 100 economic and demographic relationships that are carefully constructed to represent 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 2018. 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+ v2.4) are consistent with the North American Industry Classification System (NAICS). The REMI PI+ v2.4 model was released in 2020. Hence, the model's most recent data are from 2018, 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.<sup>2</sup> These interactions may take place within a single economy (such as the interaction

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<sup>2</sup> 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 data, we make a series of adjustments to the model. In this way, we ensure that the forecast model includes the best available information when making the final forecast. First, we update the model's national GDP forecast using the latest available national economic forecast from REMI, which contains the most recent national forecasts from the University of Michigan's Research Seminar in Quantitative Economics (RSQE) as well as the Congressional Budget Office (CBO)'s Economic Outlook. Second, we rebase the population forecast to the most recent population estimate for Clark County available from SNRPC. Third, we update the model with current 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. Lastly, we include planned new investment in public infrastructure in the model using information from the RTC.

This report proceeds as follows. Section II examines the changes in the REMI model from the prior year's model. Section III presents sequentially the changes made to update the model and tailor it to local 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' forecast. Section VI discusses the risks to the forecast. Finally, section VII concludes.

## **II. Comparison of REMI Models: Current and Previous Year**

Based on our 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 forecasts from the REMI models used in prior reports. This gives us the opportunity 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 model end with data from 2018. Thus, we refer to the current model by its last historical year 2018 (LHY2018) and the previous model by its last historical year 2017 (LHY2017).

Each year, the REMI staff and users discuss how the model works and propose adjustments and changes for improvement. The newest REMI model, PI+ v2.4 offers one major improvement: it includes a recent BLS employment projection from 2018 to 2028<sup>3</sup> as well as BEA GDP data by county and major industry. In addition, the new REMI model contains the most recent data history for 2018 and a revision of historical data back to 2001.

REMI uses the BLS employment projections, which provide insight to guide its employment and labor force growth rates in the future. BLS insists that the U.S. will exhibit slower growth in the labor force for the period from 2018 to 2028 because of an aging population and slower population growth; thus, they expect fewer people in the labor force than previous estimates. In addition, BLS projects that the health care sector and related industries and occupations will experience high demand due to an aging population. That is, more than 40 percent of the jobs added from 2018 to 2028 will come from the healthcare and social assistance sector. As a result, the employment to population ratio and the employment in the health care sector for both the United States and Clark County are revised upward.

The new REMI model also contains BEA GDP data by county and major industry, since the BEA now provides GDP statistics by county for a more detailed list of industries from 2001 to 2018,<sup>4</sup> which extended the previous data source that REMI used. Prior to this change, REMI constructed county-level data for a more detailed list of industries based on available state and national data. As the Las Vegas economy proves more unique compared to other regions in other states and in Nevada, more detailed and accurate estimates seem partly to cause the upward revisions in historical average compensation rates for the leisure and hospitality, utility, management of companies and enterprises sectors, and so on. This aligns with the explanation from BEA that GDP by county statistics along with BEA's county estimates of personal income offer a more complete picture of local area economic conditions. Average compensation rates provide one of the important factors for economic migration, which largely contributes to local population growth. These updates lead to differences in the out-of-the-box population forecasts between the LHY2018 and LHY2017 models.

Figures 1 and 2 compare the LHY2018 and LHY2017 population forecasts from the out-of-the-box models (i.e., before any updating for employment, infrastructure projects, the national GDP forecast, etc.).<sup>5</sup> The out-of-the-box population forecast arising from the LHY2018 model predicts higher population

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<sup>3</sup> <https://www.bls.gov/opub/mlr/2019/article/projections-overview-and-highlights-2018-28.htm>

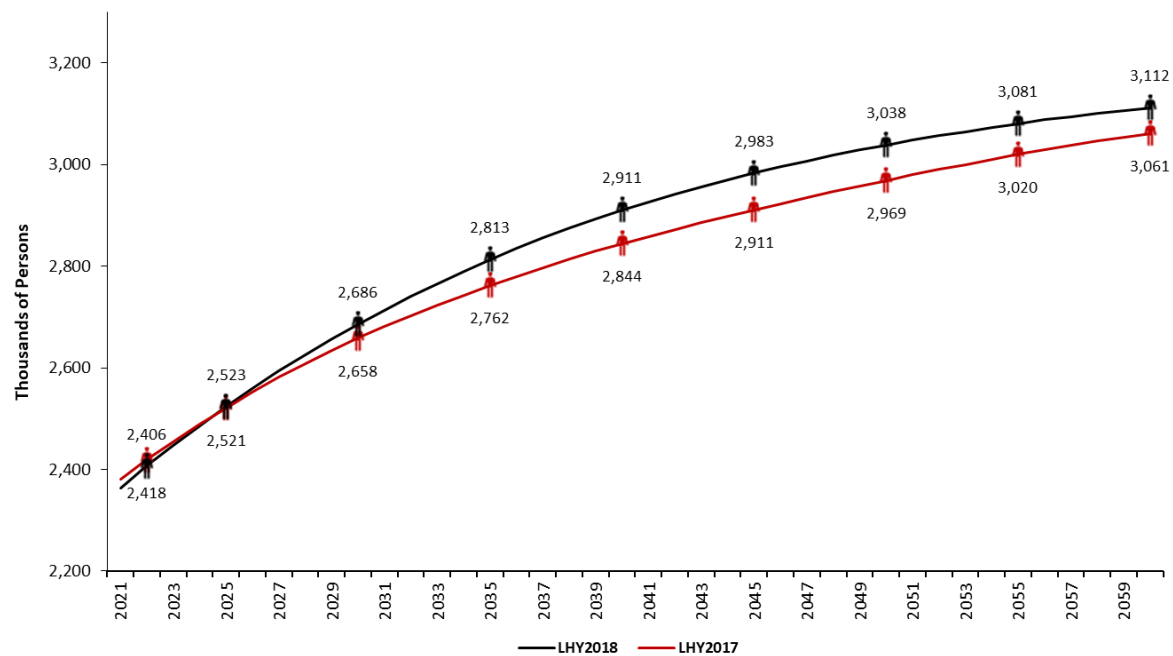
<sup>4</sup> <https://www.bea.gov/news/2019/local-area-gross-domestic-product-2018>.

<sup>5</sup> The detailed out-of-the-box results through 2060 appear in Table C1 of the Appendix C.

levels than the LHY2017 model through 2060, except for the period from 2021 to 2024. Regarding population levels, the out-of-the-box model forecasts population in the LHY2018 model for 2021 is approximately 17,300 lower than the LHY2017 model. This gap, however, diminishes over the period between 2021 to 2024, and the out-of-the box forecasted population in LHY2018 overtakes the forecast from LHY2017 in 2025. The forecasts from the LHY2018 model show a higher level thereafter, and the out-of-the-box model forecasts population in the LHY2018 model to exceed the LHY2017 model by 50,600 in 2060.

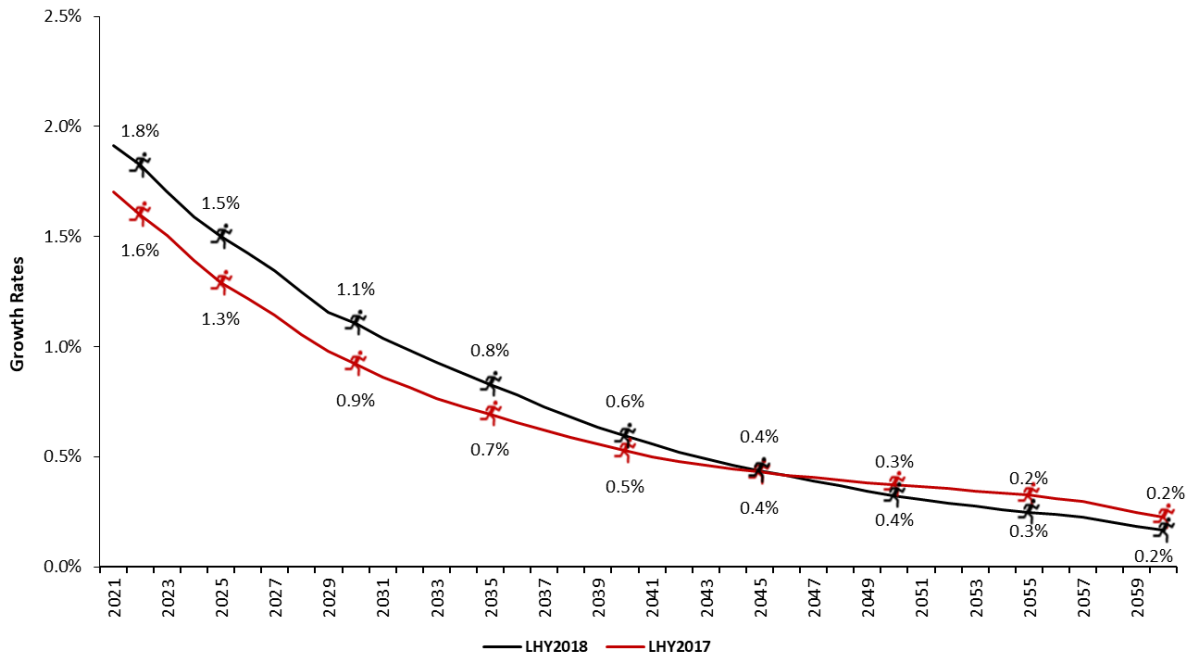
The forecasted population growth rates for the LHY2018 and LHY2017 models generally decline over the entire forecast horizon through 2060 (Figure 2). The LHY2018 model forecasts a growth rate of population that exceeds the growth rate of the LHY2017 model until 2045. The LHY2018 forecasted growth rate of population, however, falls below the growth rate of LHY2017 starting in 2046. These lower growth rates from the LHY2018 model from 2046 mainly reflect lower net migrants for the LHY2018 model compared to the LHY2017 model from 2049 due to significant lower international immigration forecasts for the FHY2018 model (Figure 3) as well as lower birth rate forecasts for the LHY2018 model compared to the LHY2017 model for the entire forecast horizon.

Figure 1. Clark County Population Forecasts: REMI Out-of-the-Box LHY2018 and LHY2017: 2021-2060



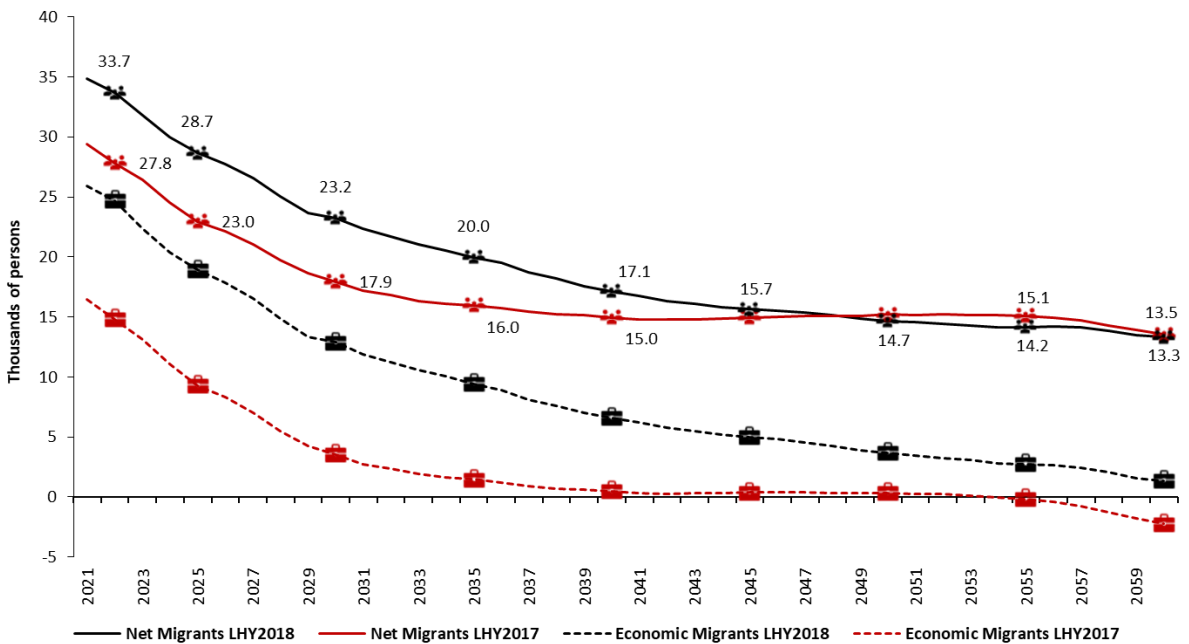
Note: Out-of-the-box refers to the model prior to recalibration. These numbers are not the final forecast.

Figure 2. Clark County Population-Growth-Rate Forecasts: REMI Out-of-the-Box LHY2018 and LHY2017: 2021-2060



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

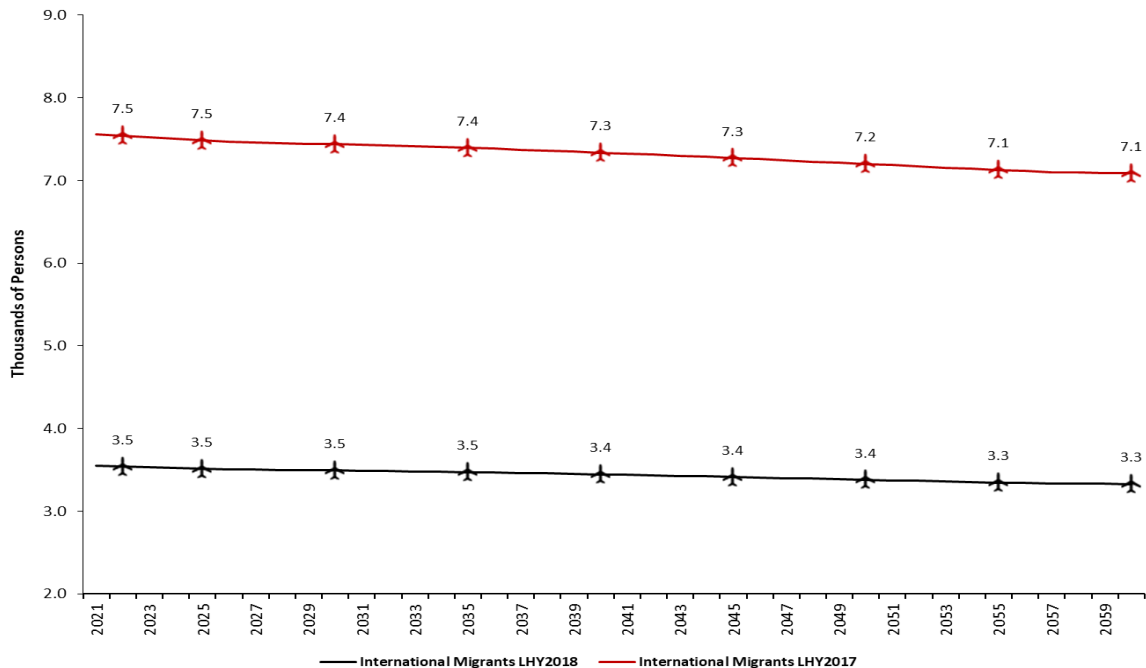
Figure 3. Clark County Net Migrant and Net Economic Migrant Forecasts: REMI Out-of-the-Box LHY2018 and LHY2017: 2021-2060



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

The lower number of net migrants<sup>6</sup> mainly reflects the reduced projections in net international migration for the LHY2018 relative to the LHY2017 models. Figure 4 shows that net international migration projections for LHY 2018 are much lower than those from LHY2017 by approximately 3,000 to 4,000 for each forecasted year. Higher projections of economic migration in the LHY2017 model lead to gains in net migration projections for the LHY2018 model compared to the LHY2017 model until 2048, as the losses from net international migration only partly offset the gains. Reduced international migration projections in the LHY2018 model, however, totally offset the gains from economic migration and produce a lower level of net migration in the LHY2018 model after 2049.

Figure 4. Clark County Net International Migrant Forecasts: REMI Out-of-the-Box LHY2018 and LHY2017: 2021-2060



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

Clark County's net international migration projections in the LHY2018 model show much lower levels compared to the LHY2017 model. This reflected the downward-revised international migration

<sup>6</sup> The REMI model defines four components of net migration: economic, retired, special, and international migration. Economic migrants are those who are under the age of 65 and emigrate from other regions to improve their living standards and to seek better job opportunities. Retired migrants are those who are aged 65 and older and 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 are prisoners, college students, and military personnel and their dependents. Finally, net international migration is defined as migrants who move from outside 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.

estimates for Clark County by the Census, as REMI uses Census estimates for international migration estimates. Therefore, the average international immigrant from 2011 to 2017 revised down to approximately 3,600 persons for the LHY2018 model, which is about the half of 6,500 persons from the LHY2017 model. As a result, net international migration projections for the LHY2018 model were revised down significantly compared to the LHY2017 model. That is, on average, Clark County expects to gain approximately 3,400 net international migrants per year from 2021 to 2060 with the LHY2018 model, which is 53.1 percent lower than the average projection of 7,300 per year by the LHY2017 model.

Table 2. Clark County REMI Out-of-the-Box Forecast Comparison: LHY2018 and LHY2017

	2021			2060		
	LHY2018	LHY2017	Change to forecast	LHY2018	LHY2017	Change to forecast
Population (Thousands)	2,363.10	2,380.43	-0.7%	3,111.83	3,061.23	1.7%
Total Employment (Thousands)	1,400.28	1,379.39	1.5%	1,660.60	1,598.51	3.9%
Total Employment as % of Nation	0.69	0.68	1.2%	0.72	0.68	3.2%
Gross Domestic Product (Billions of Fixed 2012 Dollars)	117.62	117.49	0.1%	233.42	231.91	0.7%
Gross Regional Product as % of Nation	0.60	0.60	0.8%	0.61	0.60	1.2%
Migrants (Thousands)						
Economic Migrants	25.93	16.44	57.7%	1.34	-2.26	159.5%
Retired Migrants	5.68	5.71	-0.5%	8.67	8.78	-1.3%
International Migrants	3.55	7.56	-53.1%	3.33	7.09	-53.1%
Population by Age (Thousands)						
Ages 0-14	447.85	451.19	-0.7%	471.39	472.33	-0.2%
Ages 15-24	288.19	295.11	-2.3%	334.21	331.54	0.8%
Ages 25-64	1,249.30	1,252.67	-0.3%	1,467.37	1,440.78	1.8%
Ages 64+	377.77	381.45	-1.0%	838.87	816.59	2.7%

Note: The numbers for both LHY 2018 and LHY 2017 models refer to the models prior to adjustments.

Table 2 compares the REMI out-of-the-box economic and demographic forecasts between the LHY2018 and LHY2017 models for the period between 2021 and 2060. The LHY2018 out-of-the-box model predicts a stronger Clark County economy in 2060, compared to the LHY2017 out-of-the-box model in terms of total population, employment, and real GDP. Moreover, the LHY2018 out-of-the box model projects a larger Clark County economy as a percentage of the nation in 2060 compared to the out-of-the-box LHY2017 model. Net economic migration for the LHY2018 model in 2060 is higher than the level from the LHY2017 model, which suggests Clark County economy attracts those of working age compared to the average of the U.S. economy for the entire forecast horizon. Higher levels of the net economic migration projections for the LHY2018 model contribute to a larger projected population between ages 15 and 65 compared to the LHY2017 model, which is a positive asset for Clark County in that they not only contribute to the local human capital resources but also boost the development of local businesses.



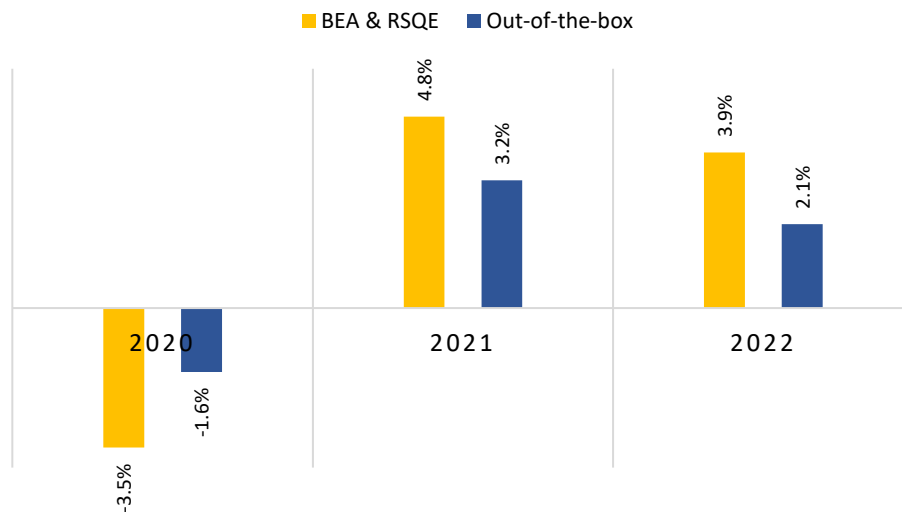
### III. Recalibrating the Model

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 2018 data for the current model, PI+ v2.4, released in 2020. To update the model, we incorporate available, pertinent model information, including the most recent national GDP forecast, most recent employment figures and forecasts, and spending on public and private capital projects to reflect local information in the forecast. We describe each update in sequence.

#### A. Adjustment of the national economic forecast

As the U.S. economy faced an unprecedented event with the COVID-19 pandemic, REMI started to release quarterly economic forecast updates to ensure that the REMI model remains up to date with the most recent available data. We, therefore, update our current REMI model, PI+ v2.4 with REMI's *March Economic Forecast Update*. REMI's March economic forecast update was released in March 2021 and includes several available data series. First, the update includes the 2019-2020 historical national data from BEA released on January 28, 2021. Second, the update contains the most recent national GDP forecast from RSQE for the near term, published on February 19, 2021. Finally, the update incorporates the CBO's *Budget and Economic Outlook* from 2021 to 2031, which was released in January and February 2021.

Figure 5. U.S. real GDP Forecasts: RSQE vs. REMI Out-of-the-Box from 2020 to 2022



Note: REMI out-of-the-box growth rates from 2020 to 2022 reflect the RSQE's March 2020 prolonged fallout forecasts. For BEA & RSQE, the growth rate for 2020 is based on the BEA estimate, but the growth rates for 2021 and 2022 show the projections by RSQE.

In 2020, national real GDP plummeted by 3.5 percent, a significantly larger drop than the 1.6 percent decline expected by RSQE (Figure 5). The out-of-the-box GDP forecasts are based on RSQE's forecasts from March 2020, which were released just after the COVID-19 outbreak. As the COVID-19 recession was deeper than expected the GDP forecasts for 2021 and 2022 are revised upward to 4.8 and 3.9 percent, respectively, from 3.2 and 2.1 percent. This proves the need of updates for the REMI model due to the rapidly changing economic conditions caused by COVID-19 and, therefore, we incorporate the *March Economic Forecast Update* from REMI into the model.

#### *B. Rebasing the population forecast*

We rebase the population forecast using the population update feature in the REMI model. We update the population in 2020 based on the most recent SNRPC Clark County population estimates, that is 2.38 million, a strong 2.2 percent increase from 2019 despite the COVID-19 outbreak. In addition, we update the population levels in 2021 and 2022 to reflect the population growth-rate forecast from *CBER's 2021 Economic Outlook*, which was published in December 2020. The latter adjustment incorporates the views of local economic experts at CBER for the short-term population forecasts. CBER projects that the Clark County population will grow by 1.7 and 2.2 percent, respectively, in 2021 and 2022. We use these forecasted population levels to update the population data in the REMI model, and then use the baseline forecast for the subsequent adjustments.

#### *C. Employment adjustment*

The county-level employment data in REMI come from the BEA's local area personal income data, which are only provided for 23 sectors. Even though BEA reports the county-level employment data for 23 sectors, 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 2018, BEA employment data are available for 2019. REMI forecasted that Clark County employment would increase by 2.1 percent in 2019, while the BEA estimated that employment climbed strongly by 3.2 percent from 2018 to 2019. In addition, the employment for the 23 sectors was revised, which resulted in an upward revision of total employment for 2018. That is, REMI indicates that the employment equals 1,351 thousand in 2018, which revises up to 1,355 thousand according to BEA. Therefore, we update the model's employment data with the most recent BEA estimates for the 23 sectors in 2019.

Table 3. Clark County Employment Levels (in 000s) before and after BEA Adjustment for 2019

INDUSTRIAL CLASSIFICATION	REMI BASELINE FORECASTS		BEA ESTIMATES	
	History 2018	2019	2018	2019
Natural Resources	3.0	3.0	2.3	2.2
Construction	76.3	76.6	77.1	83.6
Manufacturing	28.6	29.1	28.5	29.6
Retail and Wholesale	160.8	164.7	162.4	164.1
Transportation and Public Utilities	92.3	94.6	83.6	91.6
Finance, Insurance & Real Estate	144.4	145.8	147.5	152.8
Services	727.6	742.8	733.3	751.7
Government	117.2	119.3	119.7	121.8
Farm	0.4	0.4	0.4	0.4
<i>Total</i>	<i>1350.6</i>	<i>1376.4</i>	<i>1354.8</i>	<i>1397.9</i>

Note: BEA estimates are also adjusted employment. BEA revised its estimates for 2018. The difference between REMI's history data and BEA estimates is due to BEA's revisions.

Table 3 shows adjusted employment levels for 2019 after updating BEA estimates. REMI under-forecasted the Clark County employment for 2019 by 1.6 percent or 21,500 jobs. In addition, BEA revised the Clark County employment estimate for 2018, which suggests that the Southern Nevada economy experienced a strong employment gain of 4.0 percent instead of 3.4 percent<sup>7</sup>. Most sectors of Southern Nevada's economy experienced positive job growth in 2019. Strong employment gains occurred in key sectors such as construction, manufacturing, wholesale trade, transportation and warehousing, finance and insurance, administrative and support, and waste management, education, health care and social assistance, gaming, and professional and technical services. Overall, Southern Nevada's economy gained roughly 43,000 jobs in 2019. We also update the model's employment data for 2020 as most wage and salary employment data are available from the Nevada DETR for 2020. We, therefore, update the model to account for the most recent information.

The latest growth rates for the REMI model forecasts as well as recent DETR estimates appear in Table 4. The actual growth rates from DETR differ from the REMI forecasts, suggesting a need for adjustment. That is, the growth rate estimates by DETR of total employment are modestly below the REMI forecasts by 0.82 percent in 2020 despite the fact that the REMI forecasts shown in Table 4 also includes the REMI March Economic Forecasts. The employment update proceeds as follows: First, we substitute BEA employment by 23 sectors into the REMI model and get the 70-sector estimation from the REMI model for 2019. Second, we compute the annual percentage change using DETR data and apply them to produce new estimates for 2020. This procedure implicitly assumes that the proportion of self-employed

<sup>7</sup> According to REMI's historical data, Clark County employment increased by 3.4 percent in 2018.

in each industry classification grows at the same rate as does the ratio between full- and part-time workers.

Table 4. Employment Growth Rates for Clark County before DETR Adjustment for 2020

<i>INDUSTRIAL CLASSIFICATION</i>	<i>REMI FORECASTS*</i>	<i>DETR ESTIMATES</i>
Construction	-5.64%	-3.29%
Wholesale Trade	-6.78%	-6.50%
Retail Trade	-1.05%	-5.93%
Transit, Ground Passenger Transportation	-25.12%	-39.39%
Monetary Authorities, Et Al.	-5.70%	3.68%
Ins Carriers, Related Activities	-5.49%	1.65%
Real Estate	-2.84%	-11.06%
Professional, Technical Services	-6.51%	-2.42%
Management of Companies	-7.58%	-14.29%
Administrative, Support Services	-9.71%	-15.93%
Ambulatory Health Care Services	-7.47%	-1.37%
Hospitals	-10.37%	-0.43%
Amusement, Gambling, And Recreation	-36.80%	-24.10%
Accommodation	-29.62%	-35.29%
Food Services, Drinking Places	-16.31%	-21.23%
State & Local Government	-4.26%	-3.98%
<i>Total</i>	<i>-11.84%</i>	<i>-12.66%</i>

\*The 2020 REMI forecasts are updated with the REMI March Economic Forecasts.

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 5 reports the updated employment data by category for the model. The Clark County job growth numbers in 2020 shows that local economic conditions suffered severely from the COVID-19 recession as the Las Vegas economy largely depends on tourism. Even though almost all sectors experienced losses, the largest sectoral decreases in employment occurred in key sectors such as transit and ground passenger transportation, accommodation, gaming, and food services as the COVID-19 pandemic harshly hit sectors which require face-to-face contact. As a result, Southern Nevada's economy lost roughly 177,000 jobs in 2020.

Table 5. Model Job Adjustments (in 000s) for 2019 and 2020

INDUSTRIAL CLASSIFICATION	BEA ESTIMATES	DETR GROWTH RATE	ADJUSTED JOB LEVELS
	2019	2020	2020
Forestry et al.	0.36	-11.63%	0.32
Support act for agriculture and forestry	0.09	-2.33%	0.08
Oil, gas extraction	0.04	-11.43%	0.03
Mining (except oil, gas)	1.65	-11.55%	1.46
Support activities for mining	0.02	-23.81%	0.02
Utilities	2.79	-7.66%	2.58
Construction	83.63	-3.29%	80.87
Wood product manufacturing	0.59	-5.78%	0.55
Nonmetallic mineral prod manufacturing	2.59	-7.15%	2.40
Primary metal manufacturing	0.62	-12.40%	0.54
Fabricated metal prod manufacturing	2.63	-7.74%	2.43
Machinery manufacturing	0.70	-12.89%	0.61
Computer, electronic prod manufacturing	0.62	-1.13%	0.61
Electrical equip, appliance manufacturing	1.09	-6.58%	1.02
Motor vehicle manufacturing	0.36	-6.11%	0.34
Trans equip mfg exc motor vehicle	0.31	-7.21%	0.28
Furniture, related prod manufacturing	1.34	-1.12%	1.33
Miscellaneous manufacturing	6.38	0.11%	6.39
Food manufacturing	4.08	-1.67%	4.02
Beverage, tobacco prod manufacturing	0.63	1.12%	0.63
Textile mills; textile prod mills	0.48	-7.11%	0.44
Apparel manufacturing	0.49	-6.68%	0.46
Paper manufacturing	0.54	-8.57%	0.49
Printing, related supp act	2.98	-10.45%	2.67
Petroleum, coal prod manufacturing	0.05	-13.04%	0.04
Chemical manufacturing	1.28	-0.08%	1.28
Plastics, rubber prod manufacturing	1.89	-4.66%	1.80
Wholesale trade	29.89	-6.50%	27.95
Retail trade	134.23	-5.93%	126.28
Air transportation	8.63	-33.38%	5.75
Rail transportation	0.23	-7.79%	0.21
Water transportation	0.15	-41.38%	0.09
Truck transportation	6.70	-6.25%	6.29
Couriers and messengers	7.86	-6.16%	7.37
Transit, ground pass transportation	41.15	-39.39%	24.94
Pipeline transportation	0.04	-8.33%	0.03
Scenic, sightseeing transportation; supp	8.50	-15.84%	7.15
Warehousing, storage	15.59	-4.62%	14.87
Publishing, except internet	2.89	-3.60%	2.78
Motion picture, sound rec	3.96	-7.56%	3.66
Data processing, hosting, and rel services	3.72	-4.46%	3.56
Broadcasting, except int;	1.64	-8.88%	1.50
Telecommunications	4.39	0.00%	4.39

Table 5. Model Job Adjustments (in 000s) for 2019 and 2020 (continued)

INDUSTRIAL CLASSIFICATION	BEA ESTIMATES	DETR GROWTH RATE	ADJUSTED JOB LEVELS
	2019	2020	2020
Monetary authorities, et al.	18.28	3.68%	18.95
Sec, comm contracts, inv	36.34	1.65%	36.94
Ins carriers, rel act	18.41	1.65%	18.71
Real estate	70.84	-11.06%	63.00
Rental, leasing services	8.95	-10.84%	7.98
Prof, tech services	77.81	-2.42%	75.92
Mgmt of companies, enterprises	28.63	-14.29%	24.54
Administrative, support services	104.64	-15.93%	87.97
Waste mgmt, remediation services	3.11	-8.61%	2.85
Educational services	14.75	-9.13%	13.40
Ambulatory health care services	54.40	-1.37%	53.65
Hospitals	25.07	-0.43%	24.96
Nursing, residential care facilities	10.52	-5.69%	9.92
Social assistance	22.27	1.92%	22.69
Performing arts, spectator sports	26.47	-21.86%	20.68
Museums et al.	0.61	-8.24%	0.56
Amusement, gambling, recreation	17.98	-24.10%	13.65
Accommodation	170.37	-35.29%	110.25
Food services, drinking places	108.92	-21.23%	85.79
Repair, maintenance	14.63	-11.69%	12.92
Personal, laundry services	36.82	-30.13%	25.73
Membership assoc, organ	10.05	7.49%	10.81
Private households	8.09	-9.66%	7.31
State & local government	91.70	-3.98%	88.05
Federal civilian	13.73	17.16%	16.09
Federal military	16.33	2.31%	16.71
Farm	0.42	4.10%	0.43
<i>Total</i>	1,397.88	-12.66%	1,220.96

*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 April 1, 2021, the Las Vegas Convention and Visitors Authority (LVCVA) projects that hotel/motel construction will add an additional 5,119 rooms to the local room inventory by the end of 2020 (See Appendix B). This includes the opening of Virgin Hotels (rebrand of Hard Rock Hotel & Casino),

Resorts World, Hotel Cloé, and Skyline Hotel & Casino. In 2022, the LVCVA projects an additional 1,151 hotel/motel rooms will add to the room inventory. This includes the opening of Delta Hotels by Marriott, TownePlace Suites, Springhill by Marriott Airport, and Astral Las Vegas. In 2023, the LVCVA expects to see an additional 4,810 rooms added to the room stock by the Drew Las Vegas, Element Las Vegas Airport, SpringHill Suites Marriott, Element Las Vegas, Aloft Hotel, and two properties for AC Hotel by Marriot. Finally, the LVCVA expects to see an additional 720 rooms added to inventory in 2024 by Majestic Las Vegas, and an additional 700 hotel/motel rooms added to inventory in 2025 by Mardi Gras Hotel and Casino. Overall, Las Vegas is expected to see an additional 12,500 hotel/motel rooms added to inventory by the end of 2025, which is a strong 8.6 percent increase compared to the current available room inventory<sup>8</sup> despite the severe COVID-19 recession in the tourism sector.

Table 6. Expected Additional Employment due to New Rooms: Projections for 2021-2025

<i>Year</i>	<i>LVCVA Projections</i>	<i>REMI New Jobs Needed</i>	<i>Cumulative Additional REMI New Jobs</i>
<b>2021</b>	5119	7679	7679
<b>2022</b>	1151	1727	9405
<b>2023</b>	4810	7215	16620
<b>2024</b>	720	1080	17700
<b>2025</b>	700	1050	18750

Note: REMI New Jobs Needed are calculated by using a jobs-to-room multiplier of 1.5. We calibrated cumulative additional REMI new jobs in the REMI model.

The model adjustment for new hotel construction uses a jobs-to-room ratio of 1.5, which we calculated as follows.<sup>9</sup> First, we expect new hotel rooms to create new jobs in hotel services. Using historical information from 2010-2019, 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. From this calculation, we generate a jobs-to-room multiplier of roughly 1.1 for hotel services. New hotel rooms will also generate secondary economic activity and, hence, additional jobs in other sectors. For 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 use each industry's location quotient<sup>10</sup> to estimate the portion of the industry's employment attributable to tourism activity. We,

<sup>8</sup> As of February 2021, Las Vegas had 145,308 available rooms in inventory according to the LVCVA.

<sup>9</sup> The detailed computation of the jobs-to-room ratio appears in Appendix A.

<sup>10</sup> 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

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 0.4. This, together with the jobs-to-room multiplier of 1.1 for hotel services, produces the overall jobs-to-room ratio of 1.5. We, then, use the jobs-to-room multiplier as the multiplicand times the number of additional rooms, producing a cumulative increase of about 19,000 jobs by 2025 (Table 6).

This method differs from our prior reports before 2020 in that the previous method only included the number of additional jobs *over and above* the rooms and jobs already accounted for in the model. Previously, we assumed that the existing number of rooms will 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. This method works if the tourism sector remained unchanged in terms of its productivity and environment. Due to the economic downturn caused by the COVID-19 pandemic, however, we lost a significant number of hospitality jobs, and the recovery in the tourism sector lags far behind compared to other sectors as it is directly affected by business restrictions related to COVID-19. Clark County, however, recently showed early signs of an uplift in the local tourism sector. This means that an increase in REMI jobs is more likely due to the recovery of the tourism sector. Therefore, completely offsetting an increase in the REMI jobs with expected additional jobs due to the new hotel rooms will likely cause a distorted result. We, therefore, decided to once again this year use the same method we used in the *2020 CBER Population Forecast*.

#### *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.

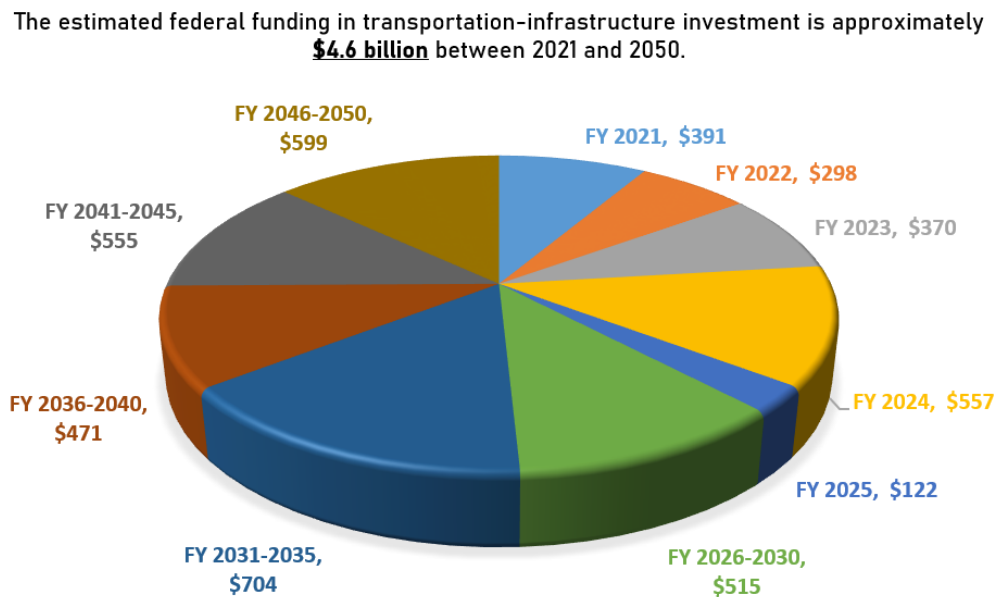
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implies that the area is producing more than is consumed by its residents. Hence, the portion of the LQ that is above 1 represents the proportion of the industry's employment attributable to tourism activity.



The estimated federal funding in transportation-infrastructure investment is about \$4.6 billion between 2021 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 Funding Allocation for the Regional Transportation Plan for Southern Nevada 2021-2050



Note: The amount shown above only includes federal funding and is displayed in millions.  
Source: The Regional Transportation Commission (RTC) of Southern Nevada

#### IV. Analysis of the Economic and Demographic Forecast

The forecast predicts significant rates of population growth for Southern Nevada in the near term and then moderating rates of growth over the forecast period extending out to 2060. The rate of growth, which decidedly exceeded the national average over the past 50 years, moderates and eventually moves below the national rate of growth as the Southern Nevada economy matures and the Clark County population ages compared to the United States with a smaller share of international migration over the forecasting horizon. The economic forecast calls for the continuation of the economic expansion over the forecast horizon. Tables 7, 8, and 9, respectively, report the final population, employment, and real GDP predictions for Clark County from the calibrated model.

### A. Population

In the short term, the current forecast predicts strong rates of population growth in Southern Nevada. The population in Clark County is predicted to grow at rates of 1.7 percent in 2021, 2.2 percent in 2022, 2.4 percent in 2023, and 2.3 percent in 2024 as the Clark County economy recovers from the COVID-19 recession (Table 7). The population growth rates in the medium term are expected to be robust but will decline over time. By 2050, the population growth rate falls to 0.37 percent, slightly below the projected<sup>11</sup> national population growth rate of 0.39 percent. The population growth rate falls further to 0.2 percent by 2060, which is slightly lower than the projected national population growth of 0.4 percent in 2060.

Table 7. Population History, REMI Forecasts, and Final Rebased Forecasts

YEAR	REMI FORECAST*	REBASED FORECAST	CHANGE IN POPULATION REBASED FORECAST	GROWTH IN POPULATION REBASED FORECAST
2020	2,319,000	2,376,683**	50,885	2.2%
2021	2,363,000	2,417,000	40,317	1.7%
2022	2,406,000	2,470,000	53,000	2.2%
2023	2,447,000	2,529,000	59,000	2.4%
2024	2,486,000	2,587,000	58,000	2.3%
2025	2,523,000	2,640,000	53,000	2.0%
2026	2,559,000	2,691,000	51,000	1.9%
2027	2,594,000	2,738,000	47,000	1.7%
2028	2,626,000	2,782,000	44,000	1.6%
2029	2,656,000	2,822,000	40,000	1.4%
2030	2,686,000	2,859,000	37,000	1.3%
2031	2,714,000	2,894,000	35,000	1.2%
2032	2,740,000	2,928,000	34,000	1.2%
2033	2,766,000	2,959,000	31,000	1.1%
2034	2,790,000	2,989,000	30,000	1.0%
2035	2,813,000	3,018,000	29,000	1.0%
2040	2,911,000	3,138,000	21,000	0.7%
2045	2,983,000	3,228,000	16,000	0.5%
2050	3,038,000	3,296,000	12,000	0.4%
2055	3,081,000	3,345,000	9,000	0.3%
2060	3,112,000	3,383,000	6,000	0.2%

\* This forecast refers to the model prior to recalibration.

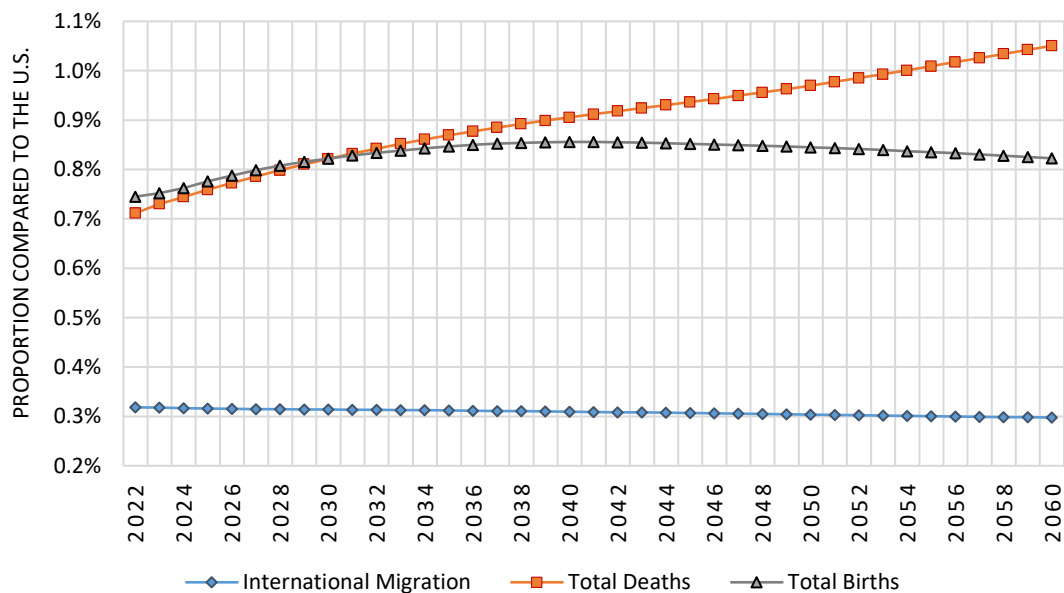
\*\* Southern Nevada consensus population estimate.

Note: A table detailing the rebased population forecast appears in the Appendix C–Table C2.

<sup>11</sup> <https://www.census.gov/data/tables/2017/demo/popproj/2017-summary-tables.html>.

To understand why the projected national population growth rate surpasses the Clark County growth rate, we examine what the REMI model predicts regarding Clark County population components for the forecasting horizon compared to those of the United States. As shown in Figure 7, the model predicts a marginally decreasing proportion of international migrants for Clark County compared to the United States. That is, the proportion of international migrants for Clark County compared to the United States will be 0.32 percent in 2022 but gradually decrease to 0.30 percent in 2060. Although the share of Clark County total births increases in the medium term thanks to over 10,000 net economic migrants per year until 2039, it decreases after 2042 with declining net economic migration. Moreover, the share of Clark County total deaths increases over the forecasting horizon. This indicates that Clark County population will age compared to the national average. We also stress that the forecasted growth rates experience increasing uncertainty as the projection extends further into the future that may ultimately lead to higher or lower forecasts with extremely high uncertainty of the current economic situation due to COVID-19. We discuss the potential sources for these uncertainties in section VI, which addresses the risks to the forecast.

Figure 7. Share of Clark County International Migration, Total Births, and Total Deaths



Note: Forecasts refer to the model after recalibration.

We forecast that Clark County will add roughly 40,300 new residents in 2021. The forecast then predicts that population growth will be stronger in the near term as the local economy recovers from the COVID-19 pandemic. Population growth, however, will slow in the future as the population ages and the local economy becomes less competitive in drawing more economic and international migrants when

compared to the average for the United States as a whole. The population forecast predicts that the Clark County population will increase to roughly 3.38 million by 2060.

### *B. Employment*

The forecast predicts a robust economic recovery for Southern Nevada in 2021. We forecast that the Las Vegas economy will experience a gain of 70,000 jobs or 5.7 percent of total jobs in 2021, as the economic recovery gains momentum with current vaccination efforts. See Table 8.<sup>12</sup> We predict that the local economic recovery will continue until 2024, by adding 33,000, 59,000 and 63,000 jobs in 2022, 2023, and 2024, respectively. The forecast predicts a full recovery of the local employment by 2024. The employment growth rate then will gradually decrease over time and stabilize at around 0.1 percent as the Southern Nevada economy matures.

Table 8. Employment Forecasts

YEAR	EMPLOYMENT FORECAST	CHANGE IN EMPLOYMENT FORECAST	GROWTH IN EMPLOYMENT FORECAST	EMPLOYMENT- POPULATION FORECAST
2020	1,221,000	-177,000	-12.7%	0.51
2021	1,291,000	70,000	5.7%	0.53
2022	1,324,000	33,000	2.6%	0.54
2023	1,383,000	59,000	4.5%	0.55
2024	1,446,000	63,000	4.6%	0.56
2025	1,472,000	26,000	1.8%	0.56
2026	1,493,000	21,000	1.4%	0.56
2027	1,507,000	14,000	0.9%	0.55
2028	1,516,000	9,000	0.6%	0.55
2029	1,522,000	6,000	0.4%	0.54
2030	1,527,000	5,000	0.3%	0.53
2031	1,535,000	8,000	0.5%	0.53
2032	1,543,000	8,000	0.5%	0.53
2033	1,551,000	8,000	0.5%	0.52
2034	1,559,000	8,000	0.5%	0.52
2035	1,567,000	8,000	0.5%	0.52
2040	1,600,000	6,000	0.4%	0.51
2045	1,634,000	7,000	0.4%	0.51
2050	1,672,000	6,000	0.4%	0.51
2055	1,701,000	5,000	0.3%	0.51
2060	1,718,000	2,000	0.1%	0.51

<sup>12</sup> Unadjusted employment forecasts are shown in Appendix C.

### 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 initial and intermediate goods. The forecast for growth in Clark County's real GDP, shown in Table 9, 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 posts a strong rebound of 6.3 percent in 2021. The real GDP growth rate forecast expects robust gains of 4.3, 5.9, and 6.0 percent, respectively, in 2021, 2022, and 2023 as the local economy continues to recover. The real GDP growth rate forecast expects to gradually decrease after 2024. The local economy expects to have a stabilized growth rate at around 1.4 percent from 2059 with a matured economy.

Table 9. Gross Domestic Product Forecasts (Billions of Fixed 2021 Dollar)

YEAR	GDP FORECAST	CHANGE IN GDP FORECAST	GROWTH IN GDP FORECAST	GDP PER CAPITA FORECAST
2020	122.65	-12.89	-9.5%	51,606
2021	130.39	7.74	6.3%	53,943
2022	135.96	5.58	4.3%	55,039
2023	144.04	8.07	5.9%	56,947
2024	152.71	8.67	6.0%	59,035
2025	157.90	5.19	3.4%	59,807
2026	162.49	4.60	2.9%	60,392
2027	166.32	3.82	2.4%	60,743
2028	169.93	3.61	2.2%	61,084
2029	173.03	3.10	1.8%	61,319
2030	176.25	3.22	1.9%	61,642
2031	179.67	3.43	1.9%	62,075
2032	183.05	3.38	1.9%	62,522
2033	186.44	3.39	1.8%	63,001
2034	189.82	3.38	1.8%	63,503
2035	193.19	3.37	1.8%	64,022
2040	209.59	3.28	1.6%	66,793
2045	226.52	3.46	1.6%	70,164
2050	244.47	3.66	1.5%	74,183
2055	263.39	3.89	1.5%	78,732
2060	283.25	4.02	1.4%	83,716

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 8. Clark County Historical Population-Growth-Rate Forecasts: 2021-2035

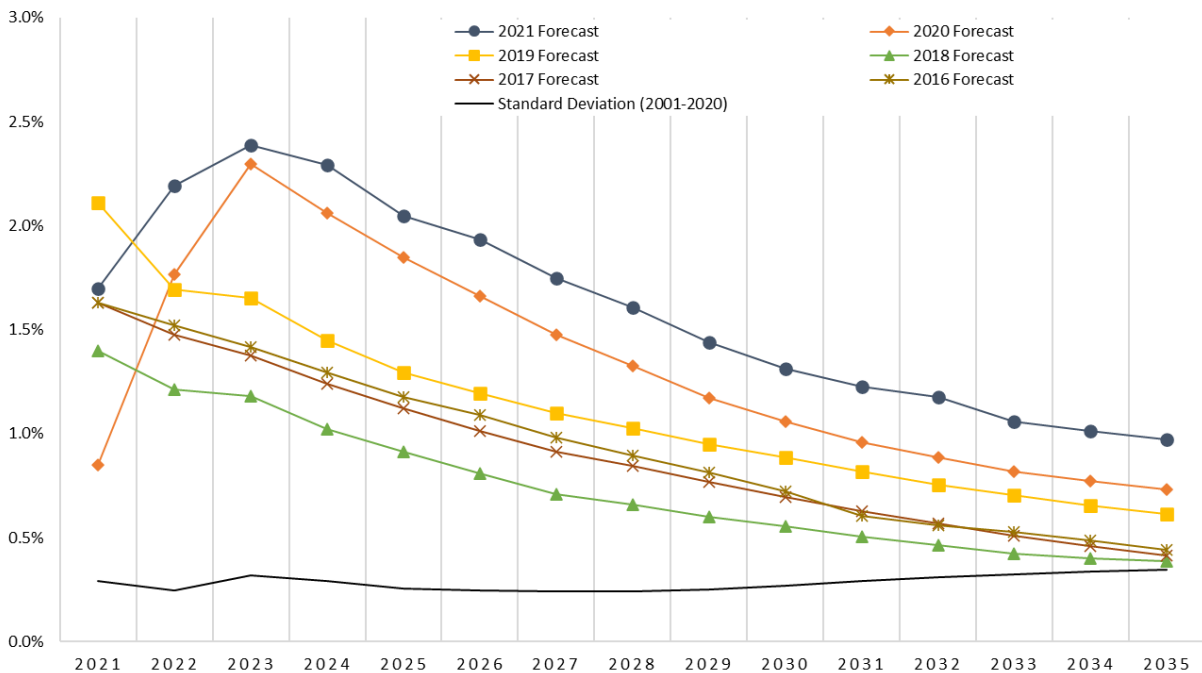


Figure 8 shows the population growth-rate forecasts generated from the 2016 to 2021 population forecast analyses as well as the standard deviation of the population-growth-rate forecast in the last 21 years (2001-2021).<sup>13</sup> The population growth-rate forecasts exhibit a similar level of variability from 2021 to 2035 as they remain around at 0.3 percent.. The standard deviation of the population growth-rate forecast for the year 2021 is roughly 0.3 percent. The variability among the population growth-rate forecasts remains around 0.3 percent in the long run. By 2030, the average of the forecasted growth rates converges to about 1.1 percent. Our forecasts prove their consistency and primarily provide long-run planning tools in that the long-term growth predictions obtained during the last 20 years remain within the same degree of consistency.

<sup>13</sup> The standard deviation measures the variability among data points. For data that follow a normal distribution, 99.7 percent of data points will fall within approximately 3 standard deviations of the mean.

## VI. Risks to the Forecast

Our Southern Nevada population forecasts rest 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 the 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.<sup>14</sup>

The main risks to the population forecasts arise from short-term fluctuations in both U.S. and Southern Nevada economic conditions. Based on our assessment of national and regional trends, we believe that the Southern Nevada economy will benefit from the current vaccination efforts and will experience a robust recovery in the near term. The speed of the recovery remains uncertain as the local economy is still vulnerable to COVID-19 due to its tourism-dependent economy. That is, the local economic recovery can be stalled by potential viral mutations. We, however, currently see early signs of renewed recovery after the summer, fall, and winter pause as more people get vaccinated. That is, Clark County visitor volume and McCarran air passengers soared by 43.8 and 59.6 percent from February to March, benefitting from eased COVID-19 related restrictions as more people get vaccinated. Las Vegas tourism started to show a strong recovery which could help to boost the mid-week hotel/motel occupancy rates as conventions could safely return to in-person services. Nevertheless, the recent slowing vaccination rate in the United States could deter the recovery speed and the return to normality.

As the majority of Clark County visitors come from the United States, the speed of the recovery of the Southern Nevada economy will largely hinge on the U.S. economic performance. The U.S. economy recently showed signs of strong improvement benefiting from the \$1.9 trillion relief package and ongoing vaccination efforts. The U.S. economy, however, recently experienced rising interest rates and signs of inflation, which can cause headwinds as the Federal Reserve policy makers may need to make decisions to taper. Economic growth in the rest of the world may also influence U.S. economic growth. The world

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<sup>14</sup> 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 research 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.

economy seems to show positive signs of recovery boosted by the rollout of the COVID-19 vaccine and additional fiscal stimulus, but the speed of the vaccine rollout is slower than the U.S., which brings concern of potential viral mutations, which could deter the speed of the U.S. economic recovery. In addition, the lower vaccination rate in other countries will slow the recovery of our tourism sector as international visitors accounted for 14 percent of total visitors to Las Vegas in 2019.<sup>15</sup>

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,<sup>16</sup> Las Vegas ranked 96<sup>th</sup> out of 100 metropolitan 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. An updated report,<sup>17</sup> however, indicates that the effort to improve economic diversification has barely occurred as Las Vegas, ranking 53rd out of 53 very large metro areas in prosperity. Washoe County, which partly succeeded in diversifying its economy after the Great Recession,<sup>18</sup> posted less vulnerabilities with the COVID-19 recession compared to Clark County. That is, Washoe County employment fell by 5.2 percent in 2020, while Clark County employment plummeted by 12.2 percent. Moreover, taxable sales in Washoe County already recovered and surpassed its pre-pandemic levels, while Clark County's taxable sales still remain lower than its pre-pandemic levels. We witnessed the vulnerability of the local economy during the Great Recession because of our tourism-based economy, and we still see the same weakness throughout the economic downturn due to the COVID-19 pandemic.

Finally, another health crisis or terrorist event similar to the Mandalay Bay shooting on October 1, 2017 could significantly lower future economic growth and, thus, the population growth. Possible virus mutations currently give a downside risk in the near future.

In summary, although we feel that the population forecast is sound, risks exist that could lead to either over- or under-forecasted population growth. Our employment forecasts seem conservative based on the most recent employment data. Nonetheless, we still believe that the downside risk may exceed

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<sup>15</sup>

[https://assets.simpleviewcms.com/simpleview/image/upload/v1/clients/lasvegas/2019\\_XTAB\\_LasVegasVPS\\_Matrix\\_Snapshot\\_a707e2cf-87d5-48e1-bca6-18e0a2d275c7.pdf](https://assets.simpleviewcms.com/simpleview/image/upload/v1/clients/lasvegas/2019_XTAB_LasVegasVPS_Matrix_Snapshot_a707e2cf-87d5-48e1-bca6-18e0a2d275c7.pdf).

<sup>16</sup> Source: The Brookings Institution (2017), *Metro Monitor*.

<sup>17</sup> Source: The Brookings Institution (2020), *Metro Monitor*.

<sup>18</sup> According to Brookings Mountain West and the Lincy Institute, Las Vegas-Henderson-Paradise experienced -3.7, -0.5, and -9.3 percent growth in productivity, average annual wage, and standard of living from 2008 to 2018, while Reno gained by 4.0, 5.4 and 4.9 percent, respectively, during the same period.



the upside risk for the Southern Nevada economy, which means that the risk of overestimating population growth may exceed the risk of its underestimation in the near term due to potential risks of viral mutations and their unpredictable effect on the economy. The economic uncertainty for the short term remains at a high-level, however, as we have never experienced an economic downturn caused by a public health crisis with massive shutdowns. 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.

## **VII. Conclusion**

The latest REMI model projects long-term population growth patterns that are consistent with previous population forecasts. Overall, the population forecast is higher than last year's forecast. These patterns reflect the new data incorporated into the model and major adjustments with current employment and population data. 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 2035, we predict that Clark County's population will reach about 3.02 million. In 2060, Clark County is expected to hit slightly above 3.38 million residents.

## Appendices:

### Appendix A: Computation of the 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. Second, new hotel rooms 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. Hence, we need an approach that accounts for these two issues. We propose the following formula:

$$\left( \text{Jobs-to-Room Ratio} \right) = \left( \text{Total employment due to tourism} \right) \div \left( \text{LVCVA room count} \right)$$

where,

$$\left( \text{Total employment due to tourism} \right) = \left( \text{Accommodation employment} \right) + \left( \text{Employment in tourism-related industries} \right) \times \left( \text{Share of employment due to tourism} \right)$$

Table A1. Computation of the Jobs-to-Room Ratio by Sequence (1) – (5)

(1) Employment (thousands)										
Industrial Classification	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Accommodation	163.4	165.7	164.6	164.9	170.6	168.9	166.4	165.5	165.0	163.4
Clothing and clothing accessories	16.8	17.4	18.3	18.5	19.0	19.2	18.5	19.3	18.9	18.5
Transit, ground pass transportation	12.4	12.9	13.3	13.4	14.0	14.2	13.4	12.4	11.0	9.9
Arts, entertainment, and recreation	15.8	16.9	17.5	17.8	18.7	19.3	20.5	21.3	22.6	23.5
Food service and drinking places	74.2	77.0	79.4	84.5	89.3	94.1	98.8	101.9	103.5	106.6

Source: Quarterly Census of Employment and Wages, U.S. Bureau of Labor Statistics

(2) Proportion of employment due to tourism* (=Location quotient**-1)										
Industrial Classification	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
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	0.84	0.96	1.00	1.00	1.00	1.00	0.98	0.98	0.94	0.95
Transit, ground pass transportation	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Arts, entertainment, and recreation	0.26	0.34	0.36	0.33	0.32	0.30	0.32	0.31	0.33	0.33
Food service and drinking places	0.20	0.23	0.22	0.24	0.24	0.24	0.25	0.24	0.22	0.22

\* 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. The portion of the LQ that is above 1 represents the proportion of the industry's employment attributable to tourism activity.

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

<i>Industrial Classification</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>
<i>Accommodation</i>	163.4	165.7	164.6	164.9	170.6	168.9	166.4	165.5	165.0	163.4
<i>Clothing and clothing accessories</i>	14.2	16.7	18.3	18.5	19.0	19.2	18.1	18.9	17.9	17.5
<i>Transit, ground pass transportation</i>	12.4	12.9	13.3	13.4	14.0	14.2	13.4	12.4	11.0	9.9
<i>Arts, entertainment, and recreation</i>	4.0	5.7	6.2	5.8	6.0	5.8	6.5	6.7	7.5	7.7
<i>Food service and drinking places</i>	14.7	17.4	17.4	20.3	21.6	22.9	24.4	24.6	22.6	23.4
<i>Total employment due to Tourism*</i>	<b>208.7</b>	<b>218.3</b>	<b>219.9</b>	<b>223.0</b>	<b>231.1</b>	<b>231.0</b>	<b>228.7</b>	<b>228.1</b>	<b>228.1</b>	<b>222.0</b>

\* The numbers may not sum to the total because of rounding.

(4) *LVCVA hotel room count (thousands)*

	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>
<i>Average room inventory</i>	148.4	149.6	150.5	150.1	150.1	149.6	148.7	147.3	147.4	148.9

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

	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>Average**</i>
<i>Jobs-to-room ratio</i>	1.41	1.46	1.46	1.49	1.54	1.54	1.54	1.55	1.52	1.49	<b>1.5</b>

\*Total employment due to tourism.

\*\*Averaged jobs-to-room ratio from 2010 to 2019.

## Appendix B: Hotel/Motel Room Construction

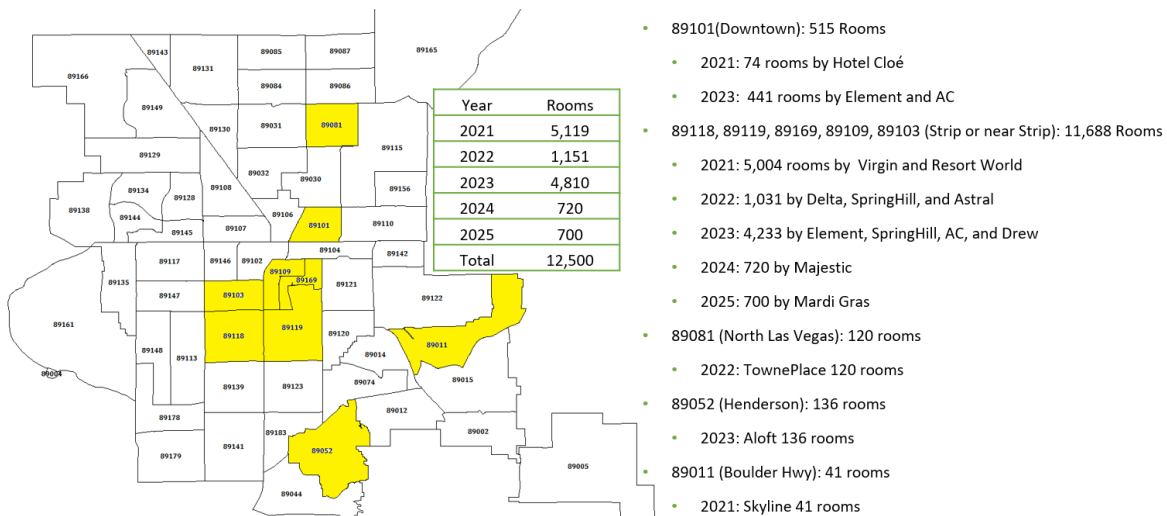
Table B1. Expected Hotel/Motel Room Construction from 2021 to 2025

Complete Year	Hotel Name	Project Details	Hotel Rooms
2021	Virgin Hotels, Curio Collection by Hilton	Rebrand	1,504
2021	Resort World Las Vegas	New property	3,500
2021	Hotel Cloé	New property	74
2021	Skyline Hotel & Casino	Additional rooms	41
2022	Delta Hotels by Marriott	New property	284
2022	TownePlace Suites	New property	120
2022	SpringHill Suites Marriott Airport	New property	127
2022	Astral Las Vegas	New property	620
2023	Element Las Vegas Airport	New property	119
2023	SpringHill Suites Marriott	New property	170
2023	AC Hotel by Marriott (Polaris/Dewey)	New property	225
2023	AC Hotel by Marriott (Grand Ctrl Pkwy/Symphony Pk)	New property	322
2023	Element Las Vegas	New property	119
2023	Aloft Hotel	New property	136
2023	Drew Las Vegas	Redeveloped resort	3,719
2024	Majestic Las Vegas	New property	720
2025	Mardi Gras Hotel and Casino	Redevelopment	700

Note: The total number of additional rooms from 2021 to 2025 equals 12,500.

Source: Las Vegas Convention and Visitor Authority

Figure B1. Expected Hotel/Motel Room Construction by Area from 2021 to 2025



Source: Las Vegas Convention and Visitor Authority; CBER

**Appendix C: Detailed Report Tables****Table C1. Out-of-the-Box Clark County Population and Population Growth Forecasts from REMI Models LHY2018 and LHY2017**

YEAR	LHY2018 POPULATION (THOUSANDS)	LHY2017 POPULATION (THOUSANDS)	LHY2018 POPULATION GROWTH	LHY2017 POPULATION GROWTH
<b>2021</b>	2,363	2,380	1.9%	1.7%
<b>2022</b>	2,406	2,418	1.8%	1.6%
<b>2023</b>	2,447	2,455	1.7%	1.5%
<b>2024</b>	2,486	2,489	1.6%	1.4%
<b>2025</b>	2,523	2,521	1.5%	1.3%
<b>2026</b>	2,559	2,552	1.4%	1.2%
<b>2027</b>	2,594	2,581	1.4%	1.1%
<b>2028</b>	2,626	2,608	1.2%	1.0%
<b>2029</b>	2,656	2,634	1.1%	1.0%
<b>2030</b>	2,686	2,658	1.1%	0.9%
<b>2031</b>	2,714	2,681	1.0%	0.9%
<b>2032</b>	2,740	2,703	1.0%	0.8%
<b>2033</b>	2,766	2,723	0.9%	0.7%
<b>2034</b>	2,790	2,743	0.9%	0.7%
<b>2035</b>	2,813	2,762	0.8%	0.7%
<b>2040</b>	2,911	2,844	0.6%	0.5%
<b>2045</b>	2,983	2,911	0.4%	0.4%
<b>2050</b>	3,038	2,969	0.3%	0.4%
<b>2055</b>	3,020	3,020	0.2%	0.3%
<b>2060</b>	3,112	3,061	0.2%	0.2%

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: 2010 – 2060

YEAR	POPULATION FORECAST	CHANGE IN POPULATION FORECAST	GROWTH IN POPULATION (PERCENT)
2010	1,951,269*	-55,078	-2.7%
2011	1,966,630**	15,361	0.8%
2012	2,008,654**	42,024	2.1%
2013	2,062,253**	53,599	2.7%
2014	2,102,238**	39,985	2.0%
2015	2,147,641**	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	2,417,000	40,317	1.7%
2022	2,470,000	53,000	2.2%
2023	2,529,000	59,000	2.4%
2024	2,587,000	58,000	2.3%
2025	2,640,000	53,000	2.0%
2026	2,691,000	51,000	1.9%
2027	2,738,000	47,000	1.7%
2028	2,782,000	44,000	1.6%
2029	2,822,000	40,000	1.4%
2030	2,859,000	37,000	1.3%
2031	2,894,000	35,000	1.2%
2032	2,928,000	34,000	1.2%
2033	2,959,000	31,000	1.1%
2034	2,989,000	30,000	1.0%
2035	3,018,000	29,000	1.0%
2036	3,044,000	26,000	0.9%
2037	3,070,000	26,000	0.9%
2038	3,094,000	24,000	0.8%
2039	3,117,000	23,000	0.7%
2040	3,138,000	21,000	0.7%
2041	3,158,000	20,000	0.6%
2042	3,177,000	19,000	0.6%
2043	3,195,000	18,000	0.6%
2044	3,212,000	17,000	0.5%
2045	3,228,000	16,000	0.5%
2046	3,244,000	16,000	0.5%
2047	3,258,000	14,000	0.4%
2048	3,271,000	13,000	0.4%
2049	3,284,000	13,000	0.4%
2050	3,296,000	12,000	0.4%
2051	3,307,000	11,000	0.3%
2052	3,317,000	10,000	0.3%
2053	3,327,000	10,000	0.3%
2054	3,336,000	9,000	0.3%
2055	3,345,000	9,000	0.3%
2056	3,354,000	9,000	0.3%
2057	3,362,000	8,000	0.2%
2058	3,370,000	8,000	0.2%
2059	3,377,000	7,000	0.2%
2060	3,383,000	6,000	0.2%

\* 2010 U.S. Census.

\*\* SNRPC consensus population estimate.

Note: The average annual forecasted growth rate is 0.9 percent.

Table C3. Economic Forecast

Variable	Unit	2021	2022	2023	2024	2025	2026	2027	2028
Total Employment	Thousands (Jobs)	1290.51	1323.73	1383.27	1445.87	1472.06	1493.41	1507.07	1516.42
Private Non-Farm Employment	Thousands (Jobs)	1166.62	1196.89	1255.53	1315.91	1340.39	1359.75	1371.87	1380.07
Residence-Adjusted Employment	Thousands	1261.17	1294.17	1353.07	1414.78	1440.80	1462.20	1476.03	1485.57
Population	Thousands	2417.09	2470.26	2529.28	2586.78	2640.11	2690.68	2738.05	2781.84
Labor Force	Thousands	1146.12	1167.53	1191.36	1225.34	1254.00	1280.86	1304.26	1324.64
Gross Domestic Product	Billions of Fixed (2021) \$	130.39	135.96	144.04	152.71	157.90	162.49	166.32	169.93
Output	Billions of Fixed (2021) \$	216.41	225.42	238.49	252.45	260.44	267.38	272.91	277.94
Value Added	Billions of Fixed (2021) \$	130.39	135.96	144.04	152.71	157.90	162.49	166.32	169.93
Personal Income	Billions of Fixed (2021) \$	126.27	123.38	127.60	133.00	137.80	142.54	147.07	152.54
Disposable Personal Income	Billions of Fixed (2021) \$	113.97	110.12	113.92	118.85	123.25	126.52	129.86	135.04
PCE-Price Index	2012=100 (Nation)	113.47	115.72	118.01	120.78	123.64	126.37	129.13	131.90

Variable	Unit	2029	2030	3035	2040	2045	2050	2055	2060
Total Employment	Thousands (Jobs)	1521.66	1527.49	1566.54	1599.64	1633.91	1672.43	1700.70	1717.93
Private Non-Farm Employment	Thousands (Jobs)	1384.37	1389.43	1425.23	1457.06	1490.91	1529.32	1558.92	1578.68
Residence-Adjusted Employment	Thousands	1491.12	1497.25	1536.97	1570.30	1604.55	1642.88	1671.18	1688.62
Population	Thousands	2821.73	2859.19	3017.56	3137.98	3228.37	3295.50	3345.44	3383.45
Labor Force	Thousands	1338.51	1350.03	1399.04	1436.58	1467.69	1493.85	1511.38	1521.84
Gross Domestic Product	Billions of Fixed (2021) \$	173.03	176.25	193.19	209.59	226.52	244.47	263.39	283.25
Output	Billions of Fixed (2021) \$	282.38	287.10	314.35	346.34	381.54	420.16	462.03	507.34
Value Added	Billions of Fixed (2021) \$	173.03	176.25	193.19	209.59	226.52	244.47	263.39	283.25
Personal Income	Billions of Fixed (2021) \$	155.90	161.48	184.20	206.96	231.24	257.36	285.11	314.00
Disposable Personal Income	Billions of Fixed (2021) \$	138.04	143.25	163.68	184.01	205.72	229.09	253.95	279.86
PCE-Price Index	2012=100 (Nation)	134.66	137.40	151.85	167.97	185.79	205.46	227.17	251.13

Table C4. Employment (in thousands)

Variable	2021	2022	2023	2024	2025	2026	2027	2028
Private Non-Farm	1290.51	1323.73	1383.27	1445.87	1472.06	1493.41	1507.07	1516.42
Forestry, Fishing, Other	0.42	0.43	0.45	0.47	0.48	0.48	0.48	0.48
Mining	1.57	1.64	1.72	1.83	1.86	1.90	1.92	1.93
Utilities	2.68	2.71	2.77	2.84	2.87	2.88	2.88	2.88
Construction	90.13	92.02	97.16	105.70	106.56	109.11	110.75	111.06
Manufacturing	29.28	29.50	29.74	29.98	30.10	30.18	30.12	30.05
Wholesale Trade	29.83	29.72	29.76	30.06	30.16	30.20	30.16	30.11
Retail Trade	131.85	129.31	129.38	130.66	131.35	131.70	131.74	131.81
Transportation and Warehousing	69.97	71.82	75.77	80.35	82.54	83.91	84.65	85.19
Information	16.56	16.74	16.77	16.89	16.85	16.74	16.60	16.44
Finance and Insurance	76.96	77.48	78.47	79.81	80.60	81.17	81.43	81.67
Real Estate and Rental and Leasing	74.59	76.16	78.06	80.38	82.02	83.38	84.33	85.07
Professional and Technical Services	80.00	82.68	84.86	87.65	89.27	90.63	91.73	92.59
Management of Companies and Enterprises	25.58	26.11	26.41	26.69	26.92	27.02	27.03	27.01
Admin and Waste Services	95.98	98.57	102.21	106.15	108.21	109.72	110.73	111.51
Educational Services	14.23	14.76	15.36	16.07	16.41	16.66	16.85	17.02
Health Care and Social Assistance	118.55	122.40	126.92	132.15	136.88	141.11	144.46	147.38
Arts, Entertainment, and Recreation	36.56	38.13	42.92	47.66	48.38	48.84	49.07	49.19
Accommodation and Food Services	211.47	222.91	248.31	268.64	275.69	279.57	281.54	282.32
Other Services (except public administration)	60.41	63.81	68.50	71.93	73.25	74.55	75.42	76.38
Government	123.48	126.43	127.32	129.54	131.26	133.24	134.78	135.93
State and local	90.47	93.64	95.47	98.77	101.58	103.76	105.49	106.87
Federal civilian	16.09	15.87	15.22	14.30	13.28	13.14	12.99	12.81
Federal military	16.93	16.92	16.63	16.47	16.40	16.34	16.31	16.26
Farm	0.41	0.41	0.42	0.42	0.42	0.42	0.42	0.42



Table C4. Employment (in thousands) (continued)

Variable	2029	2030	3035	2040	2045	2050	2055	2060
Private Non-Farm	1521.66	1527.49	1566.54	1599.64	1633.91	1672.43	1700.70	1717.93
Forestry, Fishing, Other	0.49	0.49	0.51	0.52	0.53	0.53	0.53	0.52
Mining	1.94	1.95	1.99	2.02	2.05	2.08	2.11	2.11
Utilities	2.87	2.87	2.87	2.85	2.82	2.79	2.73	2.65
Construction	110.56	109.95	108.11	106.49	106.12	106.78	107.30	107.40
Manufacturing	30.09	30.19	31.28	33.20	35.28	37.52	39.57	41.39
Wholesale Trade	30.07	30.06	30.37	30.92	31.46	31.97	32.20	32.10
Retail Trade	132.54	133.48	139.42	144.58	150.90	158.19	164.00	167.88
Transportation and Warehousing	85.59	86.04	89.11	92.28	95.54	99.02	101.83	103.89
Information	16.31	16.19	16.09	16.53	17.18	18.01	18.89	19.76
Finance and Insurance	81.74	81.92	83.03	83.28	82.98	82.50	81.27	79.24
Real Estate and Rental and Leasing	85.57	86.09	88.96	91.09	93.07	95.07	96.41	96.93
Professional and Technical Services	93.34	94.13	98.77	103.81	109.00	114.53	119.53	123.93
Management of Companies and Enterprises	27.02	27.03	27.42	28.14	28.96	29.86	30.58	31.13
Admin and Waste Services	112.12	112.78	117.01	121.34	125.75	130.41	134.28	137.27
Educational Services	17.08	17.15	17.41	17.39	17.23	17.09	16.80	16.28
Health Care and Social Assistance	149.52	151.84	163.85	174.25	184.45	195.53	205.71	215.51
Arts, Entertainment, and Recreation	49.02	48.87	48.52	48.09	47.71	47.41	46.88	46.10
Accommodation and Food Services	281.93	281.46	281.45	279.93	278.46	277.51	275.21	271.58
Other Services (except public administration)	76.57	76.93	79.07	80.37	81.40	82.52	83.10	83.01
Government	136.87	137.64	140.87	142.11	142.51	142.61	141.26	138.72
State and local	107.91	108.78	112.24	113.47	113.73	113.54	112.02	109.39
Federal civilian	12.74	12.68	12.57	12.79	13.09	13.46	13.78	14.07
Federal military	16.23	16.19	16.05	15.86	15.70	15.61	15.46	15.27
Farm	0.43	0.43	0.45	0.47	0.48	0.50	0.52	0.53

Table C5. Gross Domestic Product (billions of fixed 2021\$)\*

Variable	2021	2022	2023	2024	2025	2026	2027	2028
Personal Consumption Expenditures	105.52	108.05	112.88	118.26	122.40	126.35	129.69	133.07
Motor vehicles and parts	3.78	3.62	3.67	3.77	3.85	3.95	4.05	4.19
Furnishings and durable household equipment	3.04	3.05	3.16	3.31	3.45	3.59	3.73	3.90
Recreational goods and other durable goods	6.35	6.31	6.52	6.82	7.08	7.37	7.67	8.03
Food and beverages	7.61	7.70	7.85	8.09	8.32	8.52	8.71	8.91
Clothing and footwear	2.78	2.85	2.97	3.10	3.21	3.30	3.36	3.41
Motor vehicle fuels, lubricants, and fluids	1.87	1.95	2.03	2.08	2.15	2.18	2.20	2.19
Fuel oil and other fuels	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Other nondurable goods	9.03	8.90	9.08	9.37	9.65	9.96	10.28	10.67
Housing	15.84	16.33	16.81	17.34	17.83	18.29	18.66	19.02
Household utilities	2.17	2.22	2.24	2.28	2.33	2.36	2.39	2.42
Transportation services	2.09	2.23	2.47	2.73	2.90	3.00	3.09	3.17
Health care	15.54	16.37	17.41	18.55	19.61	20.56	21.39	22.17
Recreation and other services	35.38	36.49	38.62	40.78	41.97	43.22	44.09	44.94
Gross Private Domestic Fixed Investment	28.20	29.80	31.40	33.90	35.53	36.85	38.01	38.90
Residential	6.49	6.63	6.96	7.55	7.79	7.98	8.05	7.97
Nonresidential structures	2.72	2.96	3.50	4.19	4.61	4.92	5.15	5.34
Nonresidential equipment	10.66	11.30	11.81	12.61	13.24	13.76	14.27	14.73
Nonresidential intellectual property products	8.33	8.91	9.14	9.55	9.89	10.20	10.54	10.86
Change in Private Inventories	0.28	0.38	0.26	0.14	0.15	0.14	0.11	0.11
Government Consumption Expenditures	24.15	24.81	25.14	25.71	26.18	26.58	26.91	27.21
Federal military	8.02	8.11	8.08	8.08	8.10	8.13	8.16	8.19
Federal civilian	2.85	2.84	2.82	2.83	2.83	2.84	2.85	2.86
State and local government	13.28	13.87	14.24	14.81	15.25	15.61	15.90	16.16
Total Exports	63.95	67.65	73.30	78.49	81.14	83.04	84.47	85.79
Total Imports	92.05	94.98	99.25	104.24	107.59	110.54	112.95	115.23

\*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 2021\$) (continued)\*

Variable	2029	2030	2035	2040	2045	2050	2055	2060
Personal Consumption Expenditures	136.04	139.33	157.04	175.62	194.94	215.79	237.56	260.14
Motor vehicles and parts	4.34	4.51	5.46	6.52	7.70	9.03	10.53	12.14
Furnishings and durable household equipment	4.07	4.26	5.32	6.53	7.91	9.45	11.18	13.05
Recreational goods and other durable goods	8.40	8.82	11.24	14.07	17.36	21.27	25.68	30.60
Food and beverages	9.12	9.33	10.42	11.51	12.58	13.65	14.73	15.77
Clothing and footwear	3.45	3.49	3.67	3.82	3.90	4.15	4.27	4.32
Motor vehicle fuels, lubricants, and fluids	2.18	2.15	2.06	1.97	1.90	1.82	1.72	1.65
Fuel oil and other fuels	0.05	0.05	0.06	0.06	0.07	0.07	0.07	0.07
Other nondurable goods	11.10	11.57	14.18	17.19	20.57	24.42	28.67	33.35
Housing	19.32	19.65	21.29	22.82	24.25	25.58	26.85	27.99
Household utilities	2.44	2.48	2.67	2.84	2.99	3.12	3.25	3.35
Transportation services	3.22	3.28	3.60	3.89	4.17	4.44	4.71	4.95
Health care	22.84	23.54	27.28	31.21	35.26	39.51	43.83	48.40
Recreation and other services	45.50	46.20	49.79	53.20	56.30	59.28	62.09	64.49
Gross Private Domestic Fixed Investment	39.58	40.19	43.44	47.10	51.02	55.21	59.65	64.28
Residential	7.76	7.56	6.81	6.34	6.07	5.98	5.99	6.08
Nonresidential structures	5.47	5.58	6.10	6.60	7.12	7.69	8.29	8.92
Nonresidential equipment	15.17	15.56	17.52	19.57	21.66	23.76	25.92	28.13
Nonresidential intellectual property products	11.18	11.48	13.01	14.58	16.17	17.79	19.45	21.15
Change in Private Inventories	0.11	0.12	0.14	0.15	0.16	0.16	0.15	0.14
Government Consumption Expenditures	27.47	27.69	28.71	29.64	30.45	31.19	31.82	32.40
Federal military	8.22	8.24	8.36	8.50	8.67	8.86	9.06	9.29
Federal civilian	2.87	2.88	2.92	2.97	3.03	3.10	3.17	3.25
State and local government	16.37	16.57	17.44	18.16	18.74	19.23	19.59	19.86
Total Exports	87.00	88.25	95.83	105.07	115.45	126.98	139.81	154.15
Total Imports	117.25	119.40	132.06	148.03	165.55	184.91	205.66	227.91

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

Table C6. Income (billions of fixed 2021\$)

Variable	2021	2022	2023	2024	2025	2026	2027	2028
Total earnings by place of work	76.97	78.35	83.13	88.23	91.04	93.71	95.90	97.92
Total wage and salary disbursements	56.83	58.37	62.11	66.08	68.25	70.28	71.88	73.33
Supplements to wages and salaries	12.84	13.21	13.94	14.72	15.23	15.74	16.24	16.71
Employer contributions for employee pension and insurance funds	8.65	8.90	9.39	9.91	10.26	10.60	10.93	11.25
Employer contributions for government social insurance	4.18	4.32	4.55	4.81	4.98	5.14	5.31	5.46
Proprietors' income with inventory valuation and capital consumption adjustments	7.30	6.77	7.07	7.43	7.56	7.68	7.78	7.88
Less: Contributions for government social insurance	8.62	8.88	9.70	10.24	10.50	10.81	11.04	11.25
Employee and self-employed contributions for government social insurance	4.44	4.57	5.14	5.43	5.52	5.66	5.73	5.80
Employer contributions for government social insurance	4.18	4.32	4.55	4.81	4.98	5.14	5.31	5.46
Plus: Adjustment for residence	-0.50	-0.51	-0.58	-0.68	-0.71	-0.72	-0.72	-0.72
Gross in	1.39	1.43	1.46	1.49	1.53	1.56	1.59	1.62
Gross out	1.89	1.93	2.04	2.17	2.23	2.28	2.32	2.35
Equals: Net earnings by place of residence	67.85	68.97	72.85	77.32	79.84	82.19	84.14	85.94
Plus: Rental, personal interest, and personal dividend income	28.08	30.05	30.81	31.43	32.31	33.65	35.17	36.96
Plus: Personal current transfer receipts	30.35	24.36	23.95	24.25	25.66	26.70	27.76	29.64
Equals: Personal income	126.27	123.38	127.60	133.00	137.80	142.54	147.07	152.54
Less: Personal current taxes	12.31	13.26	13.68	14.14	14.56	16.02	17.21	17.51
Equals: Disposable personal income	113.97	110.12	113.92	118.85	123.25	126.52	129.86	135.04

Table C6. Income (billions of fixed 2021\$) (continued)

Variable	2029	2030	2035	2040	2045	2050	2055	2060
Total earnings by place of work	99.64	101.45	110.07	118.31	127.06	136.60	146.97	158.12
Total wage and salary disbursements	74.53	75.76	81.63	87.20	93.25	100.03	107.64	116.08
Supplements to wages and salaries	17.17	17.66	19.88	21.91	23.89	25.85	27.77	29.60
Employer contributions for employee pension and insurance funds	11.56	11.89	13.38	14.72	16.00	17.25	18.43	19.52
Employer contributions for government social insurance	5.61	5.77	6.50	7.19	7.88	8.60	9.34	10.08
Proprietors' income with inventory valuation and capital consumption adjustments	7.94	8.03	8.56	9.21	9.93	10.72	11.56	12.44
Less: Contributions for government social insurance	11.45	11.66	12.64	13.57	14.56	15.65	16.87	18.20
Employee and self-employed contributions for government social insurance	5.84	5.89	6.14	6.38	6.67	7.05	7.53	8.12
Employer contributions for government social insurance	5.61	5.77	6.50	7.19	7.88	8.60	9.34	10.08
Plus: Adjustment for residence	-0.71	-0.71	-0.70	-0.72	-0.76	-0.81	-0.85	-0.89
Gross in	1.65	1.68	1.83	1.97	2.12	2.29	2.48	2.69
Gross out	2.37	2.39	2.52	2.69	2.88	3.10	3.33	3.58
Equals: Net earnings by place of residence	87.48	89.09	96.74	104.03	111.74	120.14	129.25	139.03
Plus: Rental, personal interest, and personal dividend income	38.81	40.90	49.24	57.16	64.85	72.06	78.31	82.94
Plus: Personal current transfer receipts	29.61	31.49	38.21	45.77	54.65	65.15	77.55	92.03
Equals: Personal income	155.90	161.48	184.20	206.96	231.24	257.36	285.11	314.00
Less: Personal current taxes	17.86	18.24	20.52	22.95	25.52	28.27	31.16	34.14
Equals: Disposable personal income	138.04	143.25	163.68	184.01	205.72	229.09	253.95	279.86

Table C7. Population and Labor Force (in thousands)

Variable	2021	2022	2023	2024	2025	2026	2027	2028
Total population	2417.09	2470.26	2529.28	2586.78	2640.11	2690.68	2738.05	2781.84
By race and ethnicity								
White	997.46	1011.47	1027.64	1042.70	1055.75	1067.35	1077.33	1085.58
Black	282.39	288.75	295.63	302.36	308.64	314.61	320.22	325.44
Other	357.90	366.71	376.34	385.75	394.50	402.80	410.60	417.84
Hispanic	779.35	803.33	829.67	855.96	881.22	905.92	929.90	952.99
By age								
Ages 0-14	455.18	459.20	466.31	474.43	481.78	488.00	494.53	499.78
Ages 15-24	290.20	299.76	314.82	328.71	337.73	343.63	347.71	350.95
Ages 25-64	1277.11	1294.55	1314.67	1333.77	1353.25	1374.86	1395.18	1414.37
Ages 65 & older	394.60	416.75	433.49	449.87	467.35	484.18	500.63	516.75
Labor force	1143.80	1161.68	1191.36	1225.34	1254.00	1280.86	1304.26	1324.64
Labor force participation rate	0.60	0.59	0.59	0.59	0.60	0.60	0.60	0.59
Participation rates by gender								
Male (16 & older)	0.67	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Female (16 & older)	0.53	0.53	0.53	0.53	0.53	0.54	0.54	0.54

Variable	2029	2030	2035	2040	2045	2050	2055	2060
Total population	2821.73	2859.19	3017.56	3137.98	3228.37	3295.50	3345.44	3383.45
By race and ethnicity								
White	1092.01	1097.21	1108.88	1103.25	1086.24	1063.01	1037.16	1011.06
Black	330.23	334.75	354.29	369.84	381.95	391.12	397.93	403.29
Other	424.48	430.75	457.88	479.93	498.30	513.56	526.24	536.63
Hispanic	975.02	996.48	1096.50	1184.96	1261.89	1327.81	1384.12	1432.47
By age								
Ages 0-14	504.69	508.56	525.58	533.52	534.14	529.32	521.56	514.00
Ages 15-24	352.73	354.52	356.84	363.24	370.37	372.81	371.74	366.96
Ages 25-64	1431.33	1447.02	1517.07	1565.79	1600.50	1615.91	1615.29	1607.81
Ages 65 & older	532.99	549.09	618.07	675.43	723.36	777.45	836.85	894.68
Labor force	1338.51	1350.03	1399.04	1436.58	1467.69	1493.85	1511.38	1521.84
Labor force participation rate	0.59	0.59	0.57	0.56	0.56	0.55	0.55	0.54
Participation rates by gender								
Male (16 & older)	0.65	0.65	0.64	0.63	0.63	0.62	0.61	0.61
Female (16 & older)	0.53	0.53	0.51	0.50	0.49	0.49	0.48	0.48

Table D8. Demographics (in thousands)

Variable	2021	2022	2023	2024	2025	2026	2027	2028
Starting population	2376.68	2417.09	2470.26	2529.28	2586.78	2640.11	2690.68	2738.05
Births	29.09	29.27	29.90	30.43	31.07	31.62	32.11	32.53
Deaths	19.93	20.64	21.35	21.96	22.61	23.29	23.98	24.69
Natural growth	9.16	8.63	8.55	8.47	8.45	8.33	8.13	7.84
Population before migrants	2385.84	2425.71	2478.81	2537.75	2595.23	2648.45	2698.81	2745.89
Total migrants	31.24	44.55	50.48	49.02	44.89	42.23	39.24	35.96
Economic migrants	21.77	35.19	41.29	39.54	35.14	32.33	29.20	25.82
International migrants	3.55	3.54	3.53	3.52	3.51	3.50	3.50	3.50
Retired migrants	5.68	5.83	5.99	6.15	6.31	6.46	6.58	6.69
Special pops migrants	0.25	-0.01	-0.34	-0.19	-0.08	-0.06	-0.04	-0.06
Total population	2417.09	2470.26	2529.28	2586.78	2640.11	2690.68	2738.05	2781.84

Variable	2029	2030	2035	2040	2045	2050	2055	2060
Starting population	2781.84	2821.73	2989.16	3116.52	3212.36	3283.73	3336.43	3376.99
Births	32.87	33.17	34.22	34.48	34.19	33.86	33.61	33.26
Deaths	25.42	26.16	29.92	33.37	36.11	38.17	39.73	41.13
Natural growth	7.45	7.01	4.30	1.11	-1.93	-4.31	-6.12	-7.86
Population before migrants	2789.29	2828.74	2993.45	3117.63	3210.43	3279.42	3330.31	3369.13
Total migrants	32.44	30.44	24.10	20.35	17.94	16.08	15.13	14.32
Economic migrants	22.18	20.12	13.61	9.83	7.31	5.12	3.72	2.38
International migrants	3.49	3.49	3.47	3.44	3.41	3.38	3.35	3.33
Retired migrants	6.80	6.88	7.06	7.12	7.25	7.61	8.11	8.66
Special pops migrants	-0.04	-0.05	-0.03	-0.05	-0.04	-0.03	-0.05	-0.05
Total population	2821.73	2859.19	3017.56	3137.98	3228.37	3295.50	3345.44	3383.45

