Executive Summary

When catastrophe strikes, Oklahomans know that the Oklahoma National Guard will soon arrive to rescue, recover, and restore. But the Guard is also an integral part of the Oklahoma economy, employing more than 13,000 Oklahomans and pumping more than a billion dollars into the state economy annually. To raise awareness of the Guard’s contributions, this report was commissioned by the Oklahoma Army and Air National Guard to quantify and better understand the economic impacts of the Guard upon the state and the regional economies.

Data inputs used for the forecast were provided by the Oklahoma National Guard. Using the Oklahoma REMI model, a 70-sector model was developed with detailed employment, gross state product, output and other data specific to Oklahoma. This report highlights employment, gross state product, output, population, income, capital stock, and tax impacts that the Guard has upon the state of Oklahoma. Based on the results of the study, the Oklahoma National Guard has substantial impacts on the statewide economy. Over the modeled 2014 - 2018 time frame, the Oklahoma National Guard was shown to positively impact:

• **State Output** by an annual average of $2.535 billion
• **State Employment** by an average of 13,557 jobs annually
• **Gross State Product** by an annual average of $1.288 billion
• **State Real Disposable Personal Income** by an annual average of $520.877 million
Like most of the United States during the Great Recession of the last decade, the Oklahoma economy was negatively impacted, losing 56,000 jobs, and overall 3.56 percent drop. As officials struggled with the economic downturn, traditional cornerstones of state business—such as manufacturing, health care, and energy—progressed steadily in reviving the economy. Also making a significant contribution is public service, including the Oklahoma National Guard.

The Oklahoma Guard’s place in the state economy is included in its stated mission: “The Oklahoma National Guard provides trained and ready forces in support of the National Military Strategy; responds as needed to State, local, and regional emergencies to ensure peace, order, and public safety; and adds value to our communities through responsive military service.”

The Oklahoma National Guard has two missions, the state mission and the federal mission. When called upon by the Governor, the forces are acting as a state militia but when called upon by the President or during drill and annual training; the forces are acting in a federalized capacity. The Oklahoma National Guard is comprised of the Army National Guard and the Air National Guard.

The Guard’s physical presence throughout the state creates jobs both directly and indirectly. Besides actual employment, the Guard’s facilities and activities have a trickle-down effect that benefits Oklahoma communities by adding to sales tax collections, capital stock, and personal income.

Most significant is the multiplier effect for the number of secondary jobs the Guard supports in the wider economy. For every 100 employed by the guard, statewide employment would increase by an additional 227 jobs. This means, should OKNG increase employment by 100 jobs, the Oklahoma economy would experience an increase of 127 indirect jobs. The employment effect of 100 jobs at OKNG and 127 additional jobs creation generate total employment of 227 jobs.

The added economic activities triggered by the Guard’s employment have considerably strengthened the state’s economy. This study quantifies the economic impact of Guard on the state of Oklahoma as a whole and then considers the impact on one state region, the Southeast. The study shows significant economic impacts of the Guard on Oklahoma’s economic development, with the economic benefits bringing about continuous prosperity and stability to Oklahoma’s economy.
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Regional Economic Models, Inc. (REMI), based in Amherst, MA, produces economic modeling software that enables users to answer “what-if questions” about their respective economies.

Each REMI model is tailored for specific geographic regions by using data, including employment, demographic, and industry data, unique to the modeled region. The Center for Economic & Business Development uses the Oklahoma REMI model, which is a six-region, 70-sector REMI model, to forecast how a given economic activity or policy change occurring in one region would affect that region, a group of regions, and/or the state.

The REMI simulation model uses hundreds of equations and thousands of variables to forecast the impact that an economic/policy change would have upon an economy. Basically, the REMI model measures this economic impact by first forecasting the region’s performance as if there were not any changes (the control forecast), and then forecasting the region’s/state’s performance if the economic activity occurred (the alternative forecast). The difference between the two forecasts represents the economic impact of the economic activity upon the region, group of regions, and/or the state. It is this economic impact that will be reported in the Economic Impact Analysis section of this report. A basic graphic representation of some of the linkages in the economic modeling software is presented below.

As can be seen, the REMI model contains five “blocks”. Each block has its own variables and interactions so
that changing any one variable in the model not only affects other variables in its own block but also variables in other blocks. For example, if XYZ Corporation expanded its operations in Oklahoma City by hiring an additional 100 new employees, then that initial employment increase would ultimately affect output, population, migration, wage rates, etc. It is through the model’s linkages and interaction that Employment (in Block 2) directly affects Optimal Capital Stock (Block 2), Employment Opportunity (Block 4), and Real Disposable Income (Block 1). The employment gain works its way through the model to affect each of the other variables, as explained in depth below.

**Employment’s effect upon Optimal Capital Stock:**
Increases in employment gain in turn increases optimal capital stock because:
• Some new employees will demand newly constructed houses.
• Physical capital will be required to assist the labor to produce output.

Optimal Capital Stock then interacts with Actual Capital Stock (not shown) to affect the level of Investment (Block 1) in the model, which ultimately increases Oklahoma City’s Output (Block 1). When compared to Actual Capital Stock, Optimal Capital Stock spurs investment in the region because the difference represents unfulfilled demand for physical capital. Also, Output (Y) increases because it is equal to the sum of personal consumption (C), state and local government spending (G), investment (I), net exports from region (X-M), as well as demand for intermediate inputs.

**Employment’s effect upon Employment Opportunity:**
Based on the hypothetical 100 additional employees mentioned above, this gain in Employment will positively affect Wage Rates (Block 4) if the region’s employment is growing faster than the region’s Labor Force (Block 3). Wage rates interact with the Consumer Price Deflator, which is an adjustment factor accounting for differing inflation rates in various regions, to affect real wage rates (Block 4). As compared to another region, higher real wage rates in one region serve as an incentive for people to move between geographic regions; thus, real wage rates affect migration (Block 3).

**Employment’s effect upon Real Disposable Income:**
Because jobs are created, income paid to the new employees also increases. The newly employed will save a portion of their income and spend a portion of their income on consumer goods, the latter of which increases Consumption (Block 1). As a component of output, increased personal consumption produces a subsequent rise in Output.

Obviously, the previous example is only a simple illustration of a more complex model. For more information about the REMI model and its equations, please read Regional Economic Modeling by George Treyz (Kluwer Academic Publishers, 1993).1
Given the previous basic illustration of the REMI model, the process that the REMI model uses to forecast the economic impact of a policy change can be illustrated. The process begins with a policy question and concludes with a comparison between a control forecast and an alternative forecast. The accompanying diagram assists with the illustration.

A control forecast, which uses current data regarding the economy, is generated by the REMI model. The control forecast represents the projection of the economy into the future, with other things remaining constant (ceteris paribus). This means that future economic growth will follow similar patterns in the future as had been experienced in the past.

The alternative forecast allows the user to input variable changes to occur in future time periods. Only those variables that would be affected by the policy change being measured would be changed in the alternative forecast. The REMI model then forecasts economic performance based upon the policy variable changes.

The difference between the alternative and the control forecasts, measured by the distance between the two forecast lines, represents the economic impact of the policy change upon the economy. If the alternative forecast is greater than the control forecast, then a positive economic impact results for the economy. A negative economic impact results should the alternative forecast be less than the control forecast.

Forecasting Economic Impacts with the REMI Software

Policy Question
"What would be the economic impact upon Oklahoma from the expansion of ABC Establishment in the Public Administration sector?"

External Input
Increased employment/output variables in the Public Administration sector and baseline values for all other external policy variables.

Baseline value for external policy variables.

Alternative Forecast
Increased employment/output variables in the Public Administration sector and baseline values for all other external policy variables.

Policy Effect
Baseline value for external policy variables.

Control Forecast
As is observable from the accompanying map, the state of Oklahoma is divided into six regions in the REMI model used by the CEBD. They are: Northwest Oklahoma, Northeast Oklahoma, Southwest Oklahoma, Southeast Oklahoma, the Oklahoma City metro area, and the Tulsa metro area. The Oklahoma City metro area and the Tulsa metro area correspond to the Metropolitan Statistical Areas (MSAs) defined by the Office of Management & Budget.

The Office of Management & Budget (OMB) defines metropolitan areas in the United States based upon the size of the economies and commuting patterns. The two largest MSAs by population in Oklahoma are Oklahoma City MSA and Tulsa MSA. As defined by the OMB, the Oklahoma City MSA comprises seven counties (Canadian, Cleveland, Grady, Lincoln, Logan, McClain, and Oklahoma counties), and the Tulsa MSA comprises seven counties (Creek, Okmulgee, Osage, Pawnee, Rogers, Tulsa, and Wagoner counties).

Additionally, any of the regions may be combined with any combination of the other regions to produce a user-defined region for the purposes of measuring economic impact. For example, if an economic impact were to be quantified for Eastern Oklahoma, then the three regions of Northeast Oklahoma, Southeast Oklahoma and the Tulsa metro area would be combined to be reported as Eastern Oklahoma.

This report delineates the economic impact of Oklahoma National Guard on the state of Oklahoma as a whole (see map below).
It is important to note that while economic impact analysis is a valuable tool for economic development, economic impact analysis does have limitations. Resource Systems Group, Inc. identified some of the limitations of its economic impact analysis tool. Those limiting factors that pertain to REMI-modeled economic impact analysis are:

- Economic impact analysis cannot determine whether a new economic activity or project is economically feasible or profitable. It is possible that projects with very large favorable economic impact may be unprofitable.

- Economic impact analysis cannot identify the specific industries or the location of those impacted. For example, the analysis may show that a specific number of jobs will be generated in the trucking industry, but it cannot determine if those jobs will be filled from a specific town.

- Economic impact analysis cannot determine whether the outcomes of an economic activity are socially or environmentally beneficial.

Regarding the first point, the purpose of economic impact analysis is not to determine whether a new economic activity is profitable. Rather, the purpose of economic impact analysis is to quantify the impact of the new economic activity upon an economy. Other assessment tools, like market feasibility studies or cost/benefit analyses, can help decision-makers determine whether an economic activity or project is profitable.

Regarding the second point, although the economic impact cannot identify a specific company or city, the REMI model can forecast the region in which the economic impact will occur. With the state divided into six regions, the level of detail is greater in the REMI model than with other economic impact analysis models.

Regarding the final point, Resource Systems Group, Inc. reported that economic impact analysis “can only deal with impact that is easily quantifiable in dollars or employment. Environmental, health, or social impacts are not normally assessed, even though they may have economic implications.” While this may be a limitation of IMPLAN-modeled economic impact analysis, this is not a limitation with REMI-modeled economic impact analysis. Admittedly these externalities are not easily quantifiable, but they may still be quantified through the use of well-formed surveys. With a quantifiable amount associated with the externality, its impact may then be modeled through an additional simulation.

At least one other limitation when measuring the economic impact upon a region is not mentioned in the Resource Systems Group, Inc. report. That limitation relates to using aggregated industry data to measure economic impact. Most economic impact tools use historical data to model future events. Some of the historical data is aggregated in order to make the modeling tool more affordable and user-friendly. Using aggregate industry data to model the economic impact of a specific company requires the assumption that the specific company is a good sample of the aggregate of the whole industry.

Lastly, economic impact analysis is not the same tool as a cost-benefit analysis. A cost-benefit analysis quantifies all of the costs, including social and environmental costs, and all of the benefits associated with a project. If the ratio of benefits to costs is greater than 1.0, then this becomes the basis for approving a project. Economic impact analysis does not have any threshold associated with the tool. Rather, the REMI-modeled economic impact analysis will forecast quantifiable amounts of employment, population, income, etc., over a range of years for any region. These quantifiable forecasts can then be used with other tools, including cost-benefit analyses and feasibility reports to assist in the decision-making process.
Economic Impact Analysis Methodology

Separate from the limitations of economic impact analysis, there are unique limitations to the REMI model. Every economic impact model attempts to simulate real world conditions, and every economic impact model has its own unique weaknesses. The primary weakness of our REMI model is that the geographic regions in the model cannot be disaggregated further. This means that our version of the REMI model cannot forecast the economic impact upon smaller regions. Specifically, the six regions cannot be broken into the counties comprising their respective region. The reader should bear in mind that every model has its weaknesses, and, while it is not the purpose of this report to list the relative strengths and weaknesses of each of the economic impact models, we want to be as transparent as possible regarding the REMI modeling software used by the CEBD.

One of the key features differentiating the REMI simulation model from other economic impact measurement tools is the fact that REMI uses several economic impact methodologies to predict impact upon an economy. Whereas other tools rely upon one methodology to predict economic impact, REMI combines several economic impact methodologies, which has the effect of minimizing the weaknesses of any one methodology. Methodologies included in the REMI model are input-output, econometric equations, economic-base, and aspects of computable general equilibrium.

An additional strength of the REMI model involves its dynamic nature. Economic impact models relying solely on input-output are able to make only static one-year forecasts. The REMI model is able to forecast the economic impact over a number of years.

Also differentiating the REMI model from other economic impact models is its ability to report the economic impact with a myriad of economic and/or demographic variables. This means that not only will traditional economic impact variables (for example, employment, income, gross regional product, etc.) be reported by the REMI model, but the model is also able to report other economic and socioeconomic variables (for example, capital stock, economic migrants, population by age/gender, etc.) as well. By forecasting nontraditional economic and socioeconomic variables, the REMI model provides a more complete picture of the impact a given scenario would have upon an economy.
Project Information and Assumptions

This section documents key scenarios and assumptions that serve as primary inputs into the REMI model for the purposes of estimating incremental impact of Oklahoma National Guard on Gross Regional Product (GRP), Output, Employment, Income, Taxes and more.

The REMI model is a dynamic input-output modeling software that generates forecasts based on historical data. The primary national, state, and county data came from the Bureau of Economic Analysis (BEA). Other major sources of historical data were obtained from the U.S. Census Bureau, Bureau of Labor Statistics (BLS), State Employment Security Agencies (ESAs), Energy Information Administration and other related sources that serve as the foundation upon which to forecast future economic and socioeconomic variables.

All data inputs were provided by the Oklahoma National Guard (OKNG). Two complementary scenarios were developed in this study. The first scenario, a counterfactual analysis, involves the existing employment of the Oklahoma National Guard. The second scenario delineates all new constructions of Oklahoma National Guard. Variable inputs into the REMI model include employment, wage adjustment, productivity adjustment, construction expenditure and equipment cost.

In order to model the economic impact of premises that presently exists in the economy, it is necessary to remove data associated with that entity from the modeling software in the current year and the projected future years. As a result, the subsequent forecast produces negative impact when compared to the control forecast. This approach is known as a “Counterfactual Modeling.” In order to explain the positive impact that the business would have upon the economy, the results obtained were multiplied by negative one, which later refers to as a “counterfactual positive” simulation. This type of simulation assumes any dollars/jobs removed from the model will not be re-spent or re-employed elsewhere in the economy.

Employment data obtained from the Oklahoma National Guard is used to run the forecast simulation. Oklahoma National Guard comprises two major components, Oklahoma Army National Guard (OKARNG) and Oklahoma Air National Guard (OKANG). OKARNG’s members are based across the state in six different regions, while OKANG has two main bases across the state mainly in Oklahoma City MSA and Tulsa MSA. There are different categories of employees in OKNG, these include federal technicians, Active Guard and Reserve (AGR), traditional guardsmen, Active Duty Operation Support (ADOS), and State Active Duty (SAD), civilians and state and local employees.

Some federal technicians have dual-status. They are unique federal employees that are required to maintain military status as a condition of their civilian jobs. Dual-status technicians are covered by both Title 5 and Title 32. Unlike the other federal technicians that are covered only under Title 5, dual-status technicians are required to wear a military uniform as a condition of their employment, and they are exempt from overtime pay, seniority, and Merit Systems Protection Board rights that other federal workers would have. OKARNG has 538 federal technicians of which 25 are non-dual status. With this figure, 66 technicians are based in NE Oklahoma; 1 technician in NW Oklahoma; 312 technicians in Oklahoma City MSA; 38 technicians in SE Oklahoma; 36 technicians in SW Oklahoma; and 85 technicians
Service in the National Guard as a full time AGR soldier is almost exclusively under the authority of 32 USC 502(f) known as operational Title 32. Currently, OKARNG has 563 AGRs. Total AGRs are further disaggregated in six regions; 38 AGRs in NE Oklahoma; 3 in NW Oklahoma; 407 in Oklahoma City MSA; 37 in SE Oklahoma; 21 in SW Oklahoma; and 62 in Tulsa MSA. On the other hand; OKANG consists of 239 AGRs; with 99 AGRs based in Oklahoma City MSA; and 140 in Tulsa MSA.

There are three 06/COL Title-10 officers (USPFO, Sr. Army Advisor, and IG), and two 05/LTC Title-10 officers. These officers serve to provide trained units and qualified persons available for active duty in the armed forces, war or national emergency.

Traditional guardsmen, on average, work 16 hours per month, in addition to fifteen annual training days (102 hours) per year. These part-time guardsmen are augmented by full-time AGRs or technicians of OKARNG and OKANG. OKARNG has a total number of 8,351 traditional guardsmen and OKANG has 1,672 guardsmen. These amounts are translated into full-time equivalent jobs of 1,193 guardsmen in OKARNG and 239 guardsmen in OKANG, which have served as the employment inputs into the simulation. The 1,193 guardsmen of OKARNG are further distributed on six regions; 97 full-time equivalent jobs are located NE Oklahoma; 22 in NW Oklahoma; 366 in Oklahoma City MSA; 108 in SE Oklahoma; 68 in SW Oklahoma; and 176 in Tulsa MSA. OKANG’s traditional guardsmen are based mainly in two regions, 95 guardsmen in Oklahoma City MSA, and 144 guardsmen in Tulsa MSA.

Active Duty Operation Support with reserve component (ADOS-RC) usually supports training sites, study group, short-term projects, administrative or support functions. OKNG has as many as 1,916 guardsmen in this category of which 173 people are based in NE Oklahoma; 12 in NW Oklahoma; 1,064 in Oklahoma City MSA; 265 in SE Oklahoma; 78 in SW Oklahoma; and 324 in Tulsa MSA.

State Active Duty (SAD) can be activated by the Governor in response to natural or man-made disasters or Homeland Defense missions. In FY 12, there were 353 guardsmen called up for active duty, however, no documented record of hours worked on the state active duty. In order to avoid double counting the impact, the study derived full-time employment figures through labor productivity measurement. The total expenditure spent on SAD mission in FY 12 was $6,014,300. The study assumed this amount is equally distributed across the six regions, which equals to $1,002,383 per region. This amount was later used to derive labor productivity of guardsmen on each region, which translated into 81 full-time equivalent employment. The full-time employment of 81 jobs serve as the input into the REMI simulation, with 14 jobs based in NE Oklahoma; 15 jobs in NW Oklahoma; 12 jobs based in Oklahoma City MSA; 14 jobs in SE Oklahoma; 13 jobs in SW Oklahoma; and 13 jobs in Tulsa MSA.

Other employment of OKNG includes state and local employment of 370 jobs (368 full-time and 2 part-time), with 127 jobs in NE Oklahoma; 1 in NW Oklahoma; 151 in Oklahoma City MSA; 1 in SE Oklahoma; 5 in SW Oklahoma; and 83 in Tulsa MSA. Civilian employment comprises 305 jobs located in Oklahoma City MSA.
The study also assumes a conservative annual wage increment of 1.5 percent to cope with the rising inflation.

Construction inputs include remodeling project and new constructions from 2012 onwards. The Ardmore readiness center would account for a total expenditure of $23.2 million. Of this amount, construction cost would total $22 million, and $1.2 million would be spent on producer’s durable equipment. The other construction projects accounted for were $2,214,158 in SE region; $3,031,798 in SW region; $4,155,443 in NE region; $2,610,887 in Oklahoma City MSA; and $3,352,481 in Tulsa MSA.

The new Ardmore readiness center is projected to hire 18 full-time guardsmen of either AGRs or federal technicians, and 321 part-time drilling members (equal to 46 full-time members) as traditional guardsmen.

As previously mentioned, the REMI model relies on historical data to forecast the economic impact. This data was obtained from different sources and each of these sources use different measurements to report the monetary figures. BEA has reported Gross Domestic Product (GDP) and its aggregate final demand components in chained real dollars, while BLS uses fixed real dollars for data that are at the most ‘detailed’ level. In order to reconcile these two sets of variables, all real dollar concepts used in the model are based on fixed weights. This allows the industry value added and final demand totals to remain balanced.

To avoid any confusion, all monetary figures of the economic impact reported are presented in ‘current’ dollars. Current dollar is the value of a dollar at the time at which it is measured. The graphs shown from page 14 to page 23 represent the aggregated economic impact (direct, indirect, and induced impact) of the OKNG on Oklahoma’s economy.

The control forecast predicts the economic and demographic variables into the future, if nothing changes (ceteris paribus) in the economy. The alternative forecast predicts the same variables for the economy with given economic stimuli, which in this case refers to OKNG’s data inputs. The difference between the two (control forecast and alternative forecast) concludes the economic impact that the stimuli have upon the state over the study time period, if OKNG had been the only stimulus that occurred in the economy and ceteris paribus (with other things remain constant).
1. Gross State Product Impact

Economic Impact Forecast Time Frame: 2014-2018

Gross State Product (GSP) is analogous to the nation’s Gross Domestic Product (GDP) and to the region’s Gross Regional Product (GRP). It serves as a barometer to gauge the state’s economic well-being by measuring the monetary value of all final goods and services produced within the state’s economy. The difference between GSP and state output is that GSP does not include the value of intermediate goods and services produced; while state output is a broader measure of the state’s economic activities that includes the value of intermediate goods and services produced (see page 16).

The economic impact of OKNG upon GSP can be delineated by four components of spending, which include consumption spending, government spending, investment spending and net export (export minus import). These spendings are aggregated to calculate the GSP. Over the five-year time frame, the total economic impact of OKNG upon GSP would total $6.442 billion. The average economic impact that OKNG would generate is projected to equate $1.288 billion annually, representing an average increase of 2.27 percent per annum.

REM I model projects the baseline GSP (without OKNG) to be $173.711 billion in 2014, if nothing changes in the economy. This amount would surge to $174.939 billion with the addition of OKNG in Oklahoma’s economy, which spell out a significant impact of $1.228 billion.

Similarly, the REMI model forecasts Oklahoma’s initial total GSP to be $212.296 billion in 2018, if OKNG does not exist. This amount is projected to rise to $213.639 billion on GSP, yielding a positive economic impact Oklahoma’s economy. The projection mirrors an increase of $1.343 billion, signifying an increase of 9.4 percent on GSP impact since 2014.

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Total Gross State Product Impact

Economic Impact of Gross State Product

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2014 2015 2016 2017 2018

Without OKNG

With OKNG
Real disposable personal income represents the after-tax, inflation-adjusted income that can be saved and spent by income earners. Real disposable personal income is directly affected by disposable personal income, so a change in real disposable personal income will lead to a change in personal consumption. In REMI’s terms, an increase in real disposable income can be caused by an increase in disposable personal income or decrease in PCE-Price index.

With the existence of OKNG, increased employment has resulted in increased higher real disposable personal income. REMI model predicts the real disposable personal income to be $137.220 billion in 2014, if nothing changes on statewide economy (without OKNG). This amount would increase to $137.687 billion with the support of OKNG in the economy, which equals to real disposable personal income impact of $467.758 million.

As seen from the graph, the REMI model projects real disposable personal income would total $166.746 billion in 2018 for the state of Oklahoma if there were no changes. If the only change between now and then were the presence of OKNG, then the REMI model forecasts real disposable personal income would increase to $167.315 billion in the state. This means that OKNG would have almost a $569.717 million impact upon the state’s real disposable personal income in 2018.

Over the five-year time frame, the average impact of OKNG on real disposable personal income would total $520.877 million, translating to an average increase of 5.1 percent annually.
State output is a broader measure of economic activities associated with all intermediate goods and services produced and value-added (compensation and profit) within a geographic area. Alternately, state output is the sum of gross state product and all intermediate goods and services.

State output is affected by consumption, International export, investment, state and local government spending, intermediate inputs and share of domestic market, and variables affecting state output include Commodity Access Index, change in local supply, employment and intermediate inputs.

As noted in the graph, the control forecast (without OKNG) projects state output to be $328.763 billion in 2014, and this amount would increase to $331.174 billion with the existence of OKNG in the statewide economy. The 2014 economic impact that OKNG would have upon state output would equal $2.411 billion in the state. By 2018, the economic impact of OKNG upon Oklahoma’s GSP would reach $2.649 billion, suggesting a 9.9 percent increase on state output impact since 2014 and this would raise state output from the baseline to $399.855 billion.

Over the five-year time frame, total state output impact would ramp up to $12.676 billion. Average impact of OKNG on state output would total $2.535 billion, denoting an average increase at a rate of 2.4 percent.
4. Employment Impact

Economic Impact Forecast Time Frame: 2014-2018

Employment includes the number of full-time and part-time jobs. The total employment impact represents the direct, indirect and induced impacts resulted by the Oklahoma National Guard (OKNG). Direct employment impact mirrors those jobs created by OKNG. Indirect employment impact involves jobs created to support the function of OKNG, and induced employment impact is concerned with jobs created that support spending from employees directly and indirectly supported by the OKNG.

OKNG has an employment multiplier of 2.27 on Oklahoma’s economy. This means, with every 100 jobs added by OKNG, statewide employment would increase by an additional 227 jobs. The calculation of the employment multiplier is derived by taking the number of estimated average employment impact (13,557 jobs) divided by the number of OKNG’s direct full-time equivalent employment input (5,985 jobs).

OKNG’s employment impact is projected to add 13,602 jobs onto the statewide economy, from the initial 2,219,249 jobs to 2,232,851 jobs in 2014. The estimated economic impact of OKNG on employment would total 13,357 jobs by 2018.

The average employment impact is projected to account for 13,557 jobs over the five-year time span. With this figure, government employment stands a larger share, accounting for 7,708 jobs (57 percent), and private non-farm employment would account for 5,849 jobs (43 percent).
Capital stock is divided in two categories. These include residential capital stock and non-residential capital stock. Each capital stock is further disaggregated into actual capital stock and optimal capital stock. It is important to note that all reported actual capital stocks are cumulative impact that would occur in the state.

With the existence of OKNG, Oklahoma total capital stock is forecasted to reach $232.643 billion from the baseline of $232.568 billion and would eventually grow to $299.662 billion from $299.224 billion, in 2014 and in 2018 respectively. Total capital stock impact would grow as much as $74.631 million in 2014 and would escalate to $438.225 million by 2018. The average impact of total capital stock would account for $248.134 million per year.

Residential actual capital stock is the amount of residential capital (housing structures) in the region accumulated over time, net of depreciation. The economic impact of OKNG on residential actual capital stock is projected to accumulate $44.349 million and $374.695 million respectively, in 2014 and 2018. The average impact spillover on the statewide economy would equate $210.846 million. Non-residential actual capital stock is the amount of non-residential capital (non-housing structures) in the region accumulated over time, net of depreciation. In 2014, the Oklahoma’s non-residential actual capital stock impact would increase $29.281 million and would grow to $63.530 million by 2018, accounting for an average impact of $45.834 million annually.
6. Population Impact

Economic Impact Forecast Time Frame: 2014-2018

Population mirrors the mid-year estimates of people, including births, special populations, and survivors from the previous year, economic migrants, international migrants, and retired migrants.

Population affects consumption, state and local government spending and the relative housing or land prices, so any changes in population will result in a change on these variables. Population itself is largely affected by migration. Economic migrants are migrants under age 65 (who were part of the civilian population the preceding year) who respond to economic and amenity factors. Increased amenities would attract more economic migrants into an area. The economic migrant reported here is non-cumulative impact, and it would eventually taper off over time as the stimulus (OKNG) reaches the end of the forecast time frame.

Population impact of OKNG is estimated to be 6,367 people in 2014. With this figure, Oklahoma’s net economic migrant impact is predicted to be 1,395 people, accounting for 22.2 percent of the total population impact. By 2018, population impact would grow to an estimate of 10,161 people. Of this number, 537 people would be economic migrants.

If nothing changes in the economy, total population is estimated to be 3,962,703 people by 2018. However, with OKNG’s presence to stimulate the economy, this amount would roll to 3,972,865 people of the same year.

Over the five year time span, average population impact of OKNG is projected to increase 8,406 people per year in the state. Of these, the White population comprises the largest share, with 5,644 people; followed by 1,081 people classified as Other; 1,020 people in the Black population; and 661 people in the Hispanic population.

Population Impact Forecast

<table>
<thead>
<tr>
<th>Year</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>6,367</td>
</tr>
<tr>
<td>2015</td>
<td>7,534</td>
</tr>
<tr>
<td>2016</td>
<td>8,542</td>
</tr>
<tr>
<td>2017</td>
<td>9,423</td>
</tr>
<tr>
<td>2018</td>
<td>10,161</td>
</tr>
</tbody>
</table>

Average Population by Race

Without OKNG

With OKNG
Proprietors’ Income Impact (with inventory and capital adjustment)

Proprietors’ income with inventory and capital consumption adjustment is the current production income of sole proprietorships, partnership, and tax-exempt cooperatives. Corporate directors’ fees are included in proprietors’ income. Proprietors’ income excludes any dividends and monetary interest received by non-financial business and rental incomes received by persons not primarily engaged in the real estate businesses; these incomes include dividends, net interest, and rental income of persons, respectively.

As can be seen in the graph below, if nothing changes in the Oklahoma’s economy, proprietors’ income is predicted to be $17,177.678 million in 2014. This figure is projected to escalate to $17,223.981 million if OKNG’s impact was included in the state, suggesting an increase of $46.301 million in terms of proprietors’ income impact.

By the end of 2018, the economic impact of OKNG on proprietors’ income is estimated to add an additional $44.132 million onto the initial baseline projection of $19,929.218 million.

Over the forecast time period, the average impact on proprietors’ income would grow by $46.848 million per year.

Proprietors’ Income Impact Forecast (millions of current $)

<table>
<thead>
<tr>
<th>Year</th>
<th>Direct</th>
<th>Indirect</th>
<th>Induced</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>$46.303</td>
<td></td>
<td></td>
<td>$46.303</td>
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<tr>
<td>2015</td>
<td>$48.460</td>
<td></td>
<td></td>
<td>$48.460</td>
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<tr>
<td>2016</td>
<td>$47.987</td>
<td></td>
<td></td>
<td>$47.987</td>
</tr>
<tr>
<td>2017</td>
<td>$47.359</td>
<td></td>
<td></td>
<td>$47.359</td>
</tr>
<tr>
<td>2018</td>
<td>$44.132</td>
<td></td>
<td></td>
<td>$44.132</td>
</tr>
</tbody>
</table>

Economic Impact of Proprietors’ Income
8. Tax Impact

Economic Impact Forecast Time Frame: 2014-2018

The income tax impact reported in this section represents the revenues (through the spillover effects from OKNG’s employment) received by the state of Oklahoma.

Income tax revenue comprises of direct, indirect and induced impacts of OKNG. State employees who work during the work week and federal technicians, both dual and non-dual status, who work at OKNG during the work week, pay state and federal income tax. AGRs and drilling guardsmen, either traditional guardsmen or dual status federal technicians, are subject to federal income tax but not state income tax. The direct impact reported here represents only the state income tax revenue collection that occurs through some of the direct employment of OKNG, which includes state employees and federal technicians.

The economic impact that would occur due to the presence of OKNG would be $11.736 million in 2014 and would eventually rise to $15.020 million in 2018 upon Oklahoma’s income tax revenue. Over the forecast time period, OKNG’s average economic impact on state income tax revenue would equal $13.552 million per year.

Income tax is derived from personal income. The income tax impact reported in this section represents the revenues (through the spillover effects from OKNG’s employment) received by the state of Oklahoma.

Sales tax is tax collected by the government on the sales of certain goods and services. The sales tax impact reported here includes tax revenue collection for the state of Oklahoma.

The state of Oklahoma levied a 4.5 percent state tax rate on certain sales. The calculation of sales tax impact uses the same percentage of sales tax rate multiplied by consumption impact (on taxable goods and services) projected by the REMI model. Even though OKNG is not liable to pay sales tax on expenditure, the state sales tax revenue collection reported here represents the spillover effect from the direct employment, indirect and induced impacts resulted by OKNG.

The predicted sales tax revenue impact stimulated by OKNG would top $6.603 million in 2014. Over the years of the forecast time frame, this amount is projected to spiral upward to $8.072 million by 2018. Oklahoma’s sales tax impact is estimated to increase $7.376 million per year on average, accounting for an average yearly increase of 5.2 percent.

Income Tax Impact Forecast (millions of current $)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
</table>

Sales Tax Impact Forecast (millions of current $)

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>$6.603</td>
<td>$7.007</td>
<td>$7.407</td>
<td>$7.789</td>
<td>$8.072</td>
<td></td>
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</table>
Based on the findings, the possible economic impact generated by the OKNG on statewide economy is significant. The following presents a snapshot of possible economic impact of OKNG upon Oklahoma in 2018:

- **State Output Impact** would account for $2.649 billion
- **Gross State Product Impact** would account for $1.343 billion
- **Real Disposable Personal Income Impact** would account for $569.717 million
- **Employment Impact** would account for 13,358 jobs
2. Office of Management & Budget
3. Resource System Group, Inc.
4. The Oklahoma Tax Commission (http://www.oktax.state.ok.us) reports $3,307,349,252 of income tax was collected in 2012. The Bureau of Economic Analysis (http://www.bea.gov) reports personal income in Oklahoma equaled $154,958,271,000 in 2012. The proportion of income tax collected to personal income equals 2.13 percent. The calculation for Oklahoma tax revenue applies to the same proportion (income tax collected / personal income = 2.13 percent) to the personal income figure reported by the REMI model.

This project was assisted by the student interns: Diane Fitzsimmons, Eric Luthi, Kayla Misak