IMPACT OF FORT BLISS, HOLLOMAN AFB AND WHITE SANDS MISSILE RANGE ON JOBS, INCOME AND INDUSTRY OUTPUT

IN SUPPORT OF THE SOUTHERN NEW MEXICO-EL PASO COUNTY
JOINT LAND USE STUDY

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Executive Summary

Background

Federal military installations in the Southern New Mexico and El Paso County (Texas) region that comprises the focus of the Joint Land Use Study (JLUS) are vital to local economies. U.S. taxpayer money comes into the region, and each facility trains, equips and deploys national military power to protect national interests and provide security.

Local economic activity generated by each installation supports JLUS businesses and local governments that in turn provide military personnel and other workers at each facility with vibrant communities that Soldiers, Airmen and Airwomen can call home. Using the most recent and comprehensive economic data and models (2018), this study updates the economic impact task of the JLUS, and estimates the regional economic impacts of Fort Bliss, Holloman Air Force Base (AFB) and White Sands Missile Range (WSMR).

Methods and Definitions

As is the case with the 2013 JLUS study, this study used the IMPLAN (Impact Analysis for Planning) economic model to construct a model of the JLUS regional economy. IMPLAN captures both direct and secondary economic activity generated by each facility. "Direct" activity refers to employment, income and other activity at each installation without considering broader impacts to the regional economy. On the other hand, "secondary" impacts capture effects on businesses and institutions that provide goods and services that support each installation.

For example, about 47,300 people are directly employed by the federal government at Fort Bliss, and in total they earn roughly $3.8 billion in annual income. Fort Bliss employees live in the region and they spend much of their income off base for things like housing, food, entertainment and other goods and services. JLUS military installations also spend significant amounts of non-labor money to operate their bases, and much of this comes from regional private sector suppliers such as construction firms and research and development companies. Collectively, direct and secondary impacts make up total economic impacts that are larger than direct impacts by a factor (or multiplier) typically ranging from 1.2 and 2.3 depending upon the variable in question and size of economy analyzed.

Tables E-1 through E-4 summarize the total (direct and secondary) impacts of each facility at the county and regional level. Variables measured include:

- **Jobs:** Number of full and part-time jobs supported by each facility each year on average (approximately 95 percent are full time positions).

- **Labor income:** Wages, salaries and benefits paid to workers.
- **Gross domestic product (GDP)**: Sum of labor income, corporate income and profits, and taxes paid by workers and corporations.
- **Output**: Sales revenues for business, and labor income and non-labor expenditures for public sector.
- **Taxes:** State and local taxes including payroll and income taxes, property taxes, excise and severance taxes, and most licenses and fees leveed by state and local governments. Does not include federal taxes.

Other assumptions:

- Figures are total economic impacts and include both direct and secondary effects.
- Monetary figures are in millions of dollars and indexed to constant 2020 price levels
- Employment estimates rounded to the nearest tenth.
- Percent refers to each installation's share of total values for each county and region.

Table E-1
Total Economic Impacts (Direct and Secondary) of Fort Bliss, Texas by JLUS County and the JLUS Region as a Whole (Monetary figures is $millions)

County	Jobs	Income	GDP	Output	Taxes
EL Paso	77,990	$4,939	$7,871	$9,845	$278
Percent	18%	25%	24%	16%	11%
Dona Ana	3,620	$206	$284	$626	$9
Percent	4%	5%	4%	5%	2%
Lincoln	300	$19	$25	$56	$1.1
Percent	3%	6%	4%	4%	1%
Otero	410	$24	$32	$72	$1.4
Percent	1%	2%	1%	1%	<1%
Sierra	20	<$1	$1	$3	<$1
Percent	<1%	<1%	<1%	1%	<1%
Socorro	30	$1	$1	$2	<$1
Percent	<1%	<1%	<1%	<1%	<1%
Region	82,370	$5,190	$8,213	$10,604	$290
Percent	14%	18%	18%	12%	9%

Table E-2
Total Economic Impacts (Direct and Secondary) of Holloman Air Force Base, New Mexico by JLUS County and the JLUS Region as a Whole (Monetary figures is $millions)

County	Jobs	Income	GDP	Output	Taxes
EL Paso	230	$14	$20	$44	$1
Percent	<1%	<1%	<1%	<1%	<1%
Dona Ana	510	$31	$40	$89	$2
Percent	1%	1%	1%	1%	<1%
Lincoln	350	$20	$27	$60	$1
Percent	3%	6%	4%	5%	1%
Otero	6,200	$575	$741	$859	$26
Percent	23%	15%	19%	16%	15%
Sierra	40	$3	$3	$7	<$1
Percent	1%	2%	1%	1%	<1%
Socorro	50	$2	$3	$7	<$1
Percent	1%	1%	1%	1%	<1%
Region	7,380	$645	$834	$1,065	$30
Percent	1%	2%	2%	1%	1%

Table E-3
Total Economic Impacts (Direct and Secondary) of White Sands Missile Range, New Mexico by JLUS County and the JLUS Region as a Whole (Monetary figures is $millions)

County	Jobs	Income	GDP	Output	Taxes
EL Paso	520	$22.1	$41.3	$90.5	$1.8
Percent	<1%	<1%	<1%	<1%	<1%
Dona Ana	11,500	$598	$1,375	$1,632	$51
Percent	11%	14%	19%	13%	12%
Lincoln	110	$6	$8	$19	<$1
Percent	1%	2%	1%	1%	<1%
Otero	630	$40	$51	$117	$2
Percent	2%	1%	1%	2%	<1%
Sierra	$110	$6	$8	$19	<$1
Percent	2%	4%	3%	3%	<1%
Socorro	350	$22	$28	$64	$1
Percent	4%	7%	6%	8%	<1%
Region	13,220	$695	$1,512	$1,940	$57
Percent	2%	2%	3%	2%	2%

Table E-4
Total (Direct and Secondary) Combined Economic Impacts of Ft. Bliss, Holloman AFB and WSMR
(Monetary figures is $millions)

County	Jobs	Income	GDP	Output	Taxes
EL Paso	78,740	$4,975	$7,932	$9,979	$281
Percent	19%	25%	25%	17%	11%
Dona Ana	15,630	$835	$1,699	$2,347	$61
Percent	15%	19%	24%	19%	14%
Lincoln	760	$45	$60	$134	$3
Percent	7%	13%	9%	11%	2%
Otero	7,240	$639	$825	$1,047	$29
Percent	26%	17%	21%	20%	15%
Sierra	170	$9	$12	$29	$1
Percent	4%	6%	4%	5%	<1%
Socorro	430	$25	$32	$73	$2
Percent	5%	8%	7%	9%	<1%
Region	102,970	$6,529	$10,558	$13,609	$379
Percent	17%	23%	23%	16%	11%

Federal military installations are "export based" regional industries meaning that the money that funds them comes from outside of the region. Taxpayer money comes into the JLUS region, and each facility trains and equips Soldiers from Fort Bliss, fighter jets from Holloman AFB and ordinance and technology from WSMR that is "exported" from the region to protect national interests and security. Local economic activity generated by these installations supports the JLUS region that in turn provides personnel at each facility with communities that they can call home.

Each installation is a major local and or regional economic engine. Collectively, JLUS federal military installations account for 17 percent of jobs in the region and 23 percent of GDP. At the county level, impacts are also significant. For example, Ft. Bliss generates about 20 percent of jobs and 25 percent income and GDP in El Paso County. In counties adjacent to counties with military installations, spillover effects in the form commuting and trade also generate a substantial amount of economic activity.

Based on the analysis, one thing is abundantly clear: Fort Bliss, WSMR and Holloman AFB are fundamental components of the JLUS economy, particularly in El Paso, Dona Ana and Otero counties, and any large contraction or expansion of these facilities would have major positive or negative economic implications for the region.

1.0 Introduction

In August 2012, the U.S. Department of Defense's Office of Economic Adjustment awarded a grant to a partnership of six counties and three cities in New Mexico and Texas to conduct a Joint Land Use Study (JLUS) for the region encompassing Fort Bliss, Holloman Air Force Base (AFB) and White Sands Missile Range (WSMR). Nine local governments signed the SNM-El Paso JLUS Memorandum of Agreement in September 2012 including:

- City of Alamogordo, NM
- City of El Paso, TX
- City of Las Cruces, NM
- City of Doña Ana, NM
- El Paso County, TX
- Lincoln County, NM
- Otero County, NM
- Sierra County, NM
- Socorro County, NM

According to the agreement, partners contribute to final cost of the study and promote implementation of the study's final recommendations. To guide the effort, the agreement established a Regional Planning Organization supported by Technical and Policy committees and assigned committee membership to representatives from each of the region's three military installations, the New Mexico State Land Office, the Bureau of Land Management and several state agencies and commissions. Doña Ana County is the fiscal agent for the OEA grant.

The study examined the use of land, air space and other resources to establish a common vision for regional growth, while safeguarding assets of the military installations. Due to the large size of the region (27,173 square miles) and the significance of the installations to national defense, the Southern New Mexico-El Paso (SNM-El Paso) study ranks among the largest and most ambitious JLUS efforts undertaken by OEA. In addition to providing invaluable services to the nation in the form of national defense and security, the three military installations addressed in the JLUS are vital economic engines at the local and regional levels.

In general, military installations are what economists refer to as base industries from a regional perspective, which are the lifeblood of local economies because most of the money that basic industries or economic sectors generate comes from sources outside of a regional economy. A simple example would be a rural county where agriculture is the base industry. Farmers grow crops and sell or export most of their products to consumers beyond the county's borders, which in turn generates income for farmers who pay their workers and the local services they rely on such as farm suppliers, banks, grocery and retail stores, restaurants, and doctors. Without the farms, few if

any of these “non-basic” businesses would exist. Federal military installations are similar because the money that funds them comes from outside a region and like farms or manufacturing plants, these facilities support a large number of regional businesses.

Using the most recent available and comprehensive economic data, this report updates the economic impact task of the JLUS, and 1) describes socioeconomic conditions of the six-county region, 2) characterizes the region’s economic performance, and 3) estimates the impacts of Fort Bliss, Holloman AFB and WSMR on regional jobs, income and industry output. Border Research under contract with AECOM Technical Services Inc., prepared the preceding report in 2013. Much of the descriptive text in this document is from the previous report; however, economic data and associated analysis have been updated with the most current information.

The remainder of this report contains four sections: Section 2 presents an overview of JLUS military installations, Section 3 discusses regional demographics, Section 4 summarizes key indicators in the regional economy; and lastly, Section 5 presents regional and local economic impacts of JLUS military installations.

2.0 Overview of JLUS Military Installations

2.1 Fort Bliss

Headquartered in El Paso, Texas, Fort Bliss is the U.S. Army’s second largest installation covering 1,700 square miles of west Texas and south-central New Mexico. The post along with its training ranges allow for military maneuvers in an area estimated at 992,000 acres, the second largest military training range in the continental United States.

Fort Bliss was established in 1849, part of a network of western cavalry posts assigned to protect U.S. citizens from Indian raids and lawlessness. In 1893, Congress appropriated funding for construction of a permanent military installation in the region and the post acquired its current home in east El Paso. Historians note the post’s role in securing the U.S. border with Mexico during the Mexican Revolution. In March 1915, General John J. Pershing led the post’s 8th Brigade on the 1916 to 1917 Punitive Expedition into Mexico in search of outlaw Pancho Villa. Since that time, the post has served a major role in every major U.S. military conflict.

In 1991, units operating Fort Bliss’s MIM-104 Patriot Missile Defense System played a notable role in defending U.S. interests in the Middle East during the Persian Gulf War. In commemoration, US Highway 54 in northeast El Paso was renamed the Patriot Freeway. Fort Bliss benefitted greatly from the 2005 Base Realignment and Closure (BRAC). The BRAC Commission agreed to a Pentagon recommendation to transform the post from a training and education center to a heavy armor training post. The decision included relocating some 11,500 troops from the 1st Armored Division, then stationed in Germany, to Fort Bliss. Several units from Fort Sill and Fort Hood were included in

the realignment. The new mission and realignment set the stage for one of the largest gains in military units and personnel under any decision in the history of BRAC proceedings.

In 2013, Fort Bliss completed a massive $4.1 billion expansion project to accommodate the post's new mission, moving the boundaries of the old post some 10 miles to the east. The expansion included construction of new headquarters and administrative buildings, aircraft hangars, arms rooms, storage facilities, barracks, dining halls, fitness centers, medical and dental facilities, motor pool garages, and maintenance yards, greatly expanding the post's footprint, which today includes both eastern and western campuses.

Today, Fort Bliss is home to more than 44,000 active duty military and civilians. Its major units include the 1st Armored Division, which returned to the U.S. in 2011 after 40 years in Germany; the 15th Sustainment Brigade; the 32nd Army Air & Missile Defense Command, the 11th Air Defense Artillery Brigade, the 212th Fires Brigade, and the 402nd Field Artillery Brigade. In addition to its military commands, Fort Bliss hosts the headquarters for the El Paso Intelligence Center, a federal tactical operational intelligence center, and the Center's DoD counterpart, Joint Task Force North, located at Biggs Army Airfield, a military airport on Fort Bliss.

2.2 Holloman Air Force Base

Holloman AFB was established in 1942 as Alamogordo Air Field. Initial plans for the air field called for development of a center for the British Overseas Training Program. The British hoped to train their WWII aircrews over the open New Mexico skies. Those plans changed; however, when the Japanese launched a surprise attack on Pearl Harbor on December 7, 1941. The British decided not to pursue an overseas training program, and the United States saw the location as ideal for training its own growing military.

For years, Holloman has served as home to the nation's most advanced fighter aircraft. In 1992, Holloman began hosting the nation's fleet of famed F-177A Nighthawk "Stealth" fighters, the product of Lockheed's secret Skunk Works program. The remarkable F117s were for years blocked from public view, but in 1988 were unveiled to the public and served in various roles on behalf of the nation's defense. More recently, Holloman served as home to two squadrons of F-22 Raptors, an aircraft unique in delivering both fighter and strategic bombing capabilities. Advanced aircraft are not the only feature unique to Holloman. The base is also home to the longest (50,788 feet, or almost 10 miles) and fastest (approaching 10,000 feet per second, or Mach 9) test track in the world. The 846th Test Squadron set the world land speed record at Holloman for a railed vehicle with a run of 6,453 mph, or Mach 8.5.

Major units at Holloman include the remaining 49th Wing, which trains ground-based pilots and sensor operators for the unmanned MQ-1 Predator and MQ-9 Reaper aircraft; the 96th Test Group; the German Air Force Tactical Training Center and associate units, and the newly activated 54th Fighter Group, a unit of the 56th Fighter Wing headquartered in Arizona.

2.3 White Sands Missile Range

White Sands Proving Grounds was established in July 1945 in the Tularosa Basin of south central New Mexico, a combination of an existing firing range, the Alamogordo Bombing Range and large tracts of private and public lands. Almost 3,200 square miles in size, the Range is speckled today with the abandoned ranch houses and windmills of an earlier time. There also are several old abandoned silver and gold mines near the Gap Site of the Sierra Oscura. Later, White Sands Proving Grounds was renamed White Sands Missile Range (local residents pronounce its acronym WSMR as “Whiz-Mer").

The Range occupies a somewhat rectangular strip of land, nearly 40 miles wide (east to west) and 100 miles long (north to south). It is the largest military installation in the United States and could hold the states of Delaware and Rhode Island. The main post is 20 miles east of Las Cruces and 45 miles north of El Paso, Texas. This strip of New Mexico desert has been in use since the 1940's to test practically every weapon system in the U.S. military arsenal. As a public service, WSMR hosts annual tours of Trinity Site, now located on the north end of the Range, the site of the world’s first atomic bomb explosion on July 16, 1945.

In addition to firing rockets and missiles, the Range has developed sub-installations in other areas of New Mexico, Colorado, Utah, Idaho, and El-Paso for long-range testing. In these tests the missiles are fired from a remote location and directed to land on WSMR. In 1982, White Sands provided an alternate landing site for the space shuttle program; the orbiter Columbia landed on the Range's Northrup Strip after its third flight into space. Also located at WSMR, the High Energy Laser Systems Test Facility (HELSTF) has extensive capabilities and infrastructure for testing an array of laser technology programs and weapons. HELSTF has access to WSMR’s 3,200 square miles of restricted land area and 7,000 square miles of restricted airspace in which to conduct static and dynamic live fire, lethality, vulnerability, and material interaction testing. Another recently added mission at WSMR is the NASA Commercial Crew Transportation System initiative to launch the Boeing CST-100 Starliner spacecraft from the Cape Canaveral Air Force Station and perform landing and recovery operations for two WSMR sites for two test missions followed by subsequent missions up to two times per year. Boeing, NASA and the U.S. Army conducted a series of these exercises at WSMR, known as mission dress rehearsals, in September of 2019.

Several tenant organizations share use of the range and occupy facilities at WSMR including the U.S. Naval Air Warfare Center Weapons Division; United States Air Force assets; the Army's Battlefield Environment Directorate and Survivability/Lethality Analysis Directorate; the National Aeronautics and Space Administration (NASA) White Sands Test Facility; the Army's Training and Doctrine Command's Analysis Center; and the Center for Counter Measures, an organization that reports directly to the DOD. One of the largest tenants at WSMR is the U.S. Army Test and Evaluation Command.

Today, the U.S. Army manages WSMR as a military research, testing, and support facility with large expanses of land and unlimited top-to-bottom airspace for testing of the nation's latest military weapons systems. WSMR cooperates with Holloman AFB in the scheduled use of controlled airspace over a vast, open region of south-central New Mexico.

3.0 Regional Demographics

Section 3.0 discusses demographic characteristics and trends in the JLUS study area including geography, population, education, age characteristics, and ethnicity.

3.1 Geography and Population

The Southern New Mexico-El Paso JLUS region occupies 27,173 square miles, an area covering nearly one percent of the land mass in the continental U.S. The landscape is diverse with expanses of high desert mesa, river bosque, and subalpine forest. Geologic highlights include one of the world's largest inactive volcanoes, Kilbourne Hole, and a rare deposit of white gypsum sands, much of which lies within the boundaries of the White Sands National Park. At its higher elevations, the region overlaps portions of the Lincoln National Forest and includes Sierra Blanca Peak, which at 11,981 feet above sea level, marks the region's highest elevation. Another notable geographic feature is the Rio Grande River, the legendary waterway of the Western U.S. that provides the region with one of its few sources of renewable surface water.

The JLUS region consists of the New Mexico counties of Doña Ana, Lincoln, Otero, Sierra and Socorro and El Paso County in Texas. Incorporated cities include Alamogordo, Anthony, Elephant Butte, Las Cruces, Sunland Park, Socorro, and Truth or Consequences in New Mexico and El Paso, Horizon City, and Socorro in Texas. The unincorporated community of Chaparral, a narrow finger of public and private land situated between the Fort Bliss and White Sands Missile Range, is also included in the study. Other incorporated areas in the JLUS region include:

Towns

- Anthony, TX
- Carrizozo, NM
- Clint, TX
- Mesilla, NM

Villages

- Capitan, NM
- Cloudcroft, NM
- Corona, NM
- Hatch, NM
- Magdalena, NM
- Ruidoso, NM
- Ruidoso Downs, NM
- Tularosa, NM
- Vinton, TX
- Williamsburg, NM

As shown in Table 3-1, in 2019 the U.S. Census Bureau estimated that the JLUS area had a population of 1,172,320 people, much of it concentrated in the major urban centers of El Paso (60 percent) and Las Cruces (9 percent). Most other incorporated areas are relatively small with populations of less than 20,000 people. Annual population growth in the region from 2000 through 2019 has hovered around 1.0 percent per year on average, which is higher than the national average and on par with New Mexico (1.18 percent from 2000 through 2019) as a whole, but not as high as Texas, which has grown by 2.16 percent per annum over the last two decades.

Population increases in Dona Ana County (home to Las Cruces) have been positive and in line with state level growth, and El Paso County in Texas has grown significantly as well. Otero County grew at rate of 0.4 percent over the two decade period, and population levels in Lincoln County have remained relatively stable. All of the above counties are within reasonable commuting distances to one of the three JLUS military installations. Sierra and Socorro counties in New Mexico, which are farther from JLUS military facilities have experienced modest declines in population over the last two decades mirroring similar trends among smaller rural counties in many U.S. states.

Table 3-1
Population Trends in Incorporated and Unincorporated JLUS Areas and Compound Annual Growth Rates
(2000-2019, "NA" – not applicable)

	2000	2010	2019	Growth rate (2000-2010)	Growth rate (2010 -2019)	Growth rate (2000-2019)
Doña Ana County (NM)						
Anthony	NA	9,573	9,308	NA	-0.35%	-0.35%
Hatch Village	1,673	1,648	1,606	-0.15%	-0.32%	-0.23%
Las Cruces	74,267	97,618	102,296	2.77%	0.59%	1.79%
Mesilla	2,189	2,196	1,835	0.03%	-2.22%	-0.98%
Sunland Park	13,309	14,106	17,639	0.58%	2.83%	1.58%
Total incorporated areas	91,438	125,141	132,684	3.19%	0.73%	2.09%
Total Dona Ana County	174,682	209,233	217,522	1.82%	0.49%	1.23%
Lincoln County (NM)						
Capitan	1,443	1,489	1,413	0.31%	-0.65%	-0.12%
Carrizozo	1,036	996	936	-0.39%	-0.77%	-0.56%
Corona	165	172	160	0.42%	-0.90%	-0.17%
Ruidoso Village	7,698	8,029	7,848	0.42%	-0.28%	0.11%
Ruidoso Downs	1,824	2,815	2,683	4.43%	-0.60%	2.17%
Total incorporated areas	12,166	13,501	13,040	1.05%	-0.43%	0.39%
Total Lincoln County	19,411	20,497	19,556	0.55%	-0.59%	0.04%
Otero County (NM)						
Alamogordo	35,582	30,403	31,701	-1.56%	0.52%	-0.64%
Cloudcroft	749	674	698	-1.05%	0.44%	-0.39%
Tularosa	2,864	2,842	2,978	-0.08%	0.59%	0.22%
Total incorporated areas	39,195	33,919	35,377	-1.44%	0.53%	-0.57%
Total Otero County	62,298	63,797	66,781	0.24%	0.57%	0.39%
Sierra County (NM)						
Elephant Butte	1,390	1,431	1,324	0.29%	-0.97%	-0.27%
Truth or Consequences	7,289	6,475	5,865	-1.18%	-1.23%	-1.20%
Williamsburg	527	449	413	-1.59%	-1.04%	-1.35%
Total incorporated areas	9,206	8,355	7,602	-0.97%	-1.17%	-1.06%
Total Sierra County	13,270	11,988	10,968	-1.01%	-1.11%	-1.05%
Socorro County (NM)						
Magdalena	913	938	880	0.27%	-0.79%	-0.20%
Socorro	8,877	9,051	8,407	0.19%	-0.92%	-0.30%
Total incorporated areas	9,790	9,989	9,287	0.20%	-0.91%	-0.29%
Total Socorro County	18,078	17,866	16,735	-0.12%	-0.81%	-0.43%
El Paso County (TX)						
Anthony	3,850	5,011	5,655	2.67%	1.52%	2.16%
Clint	980	926	1,114	-0.57%	2.34%	0.71%
El Paso	563,662	649,152	682,669	1.42%	0.63%	1.07%
Horizon City	5,233	16,730	19,741	12.32%	2.09%	7.66%

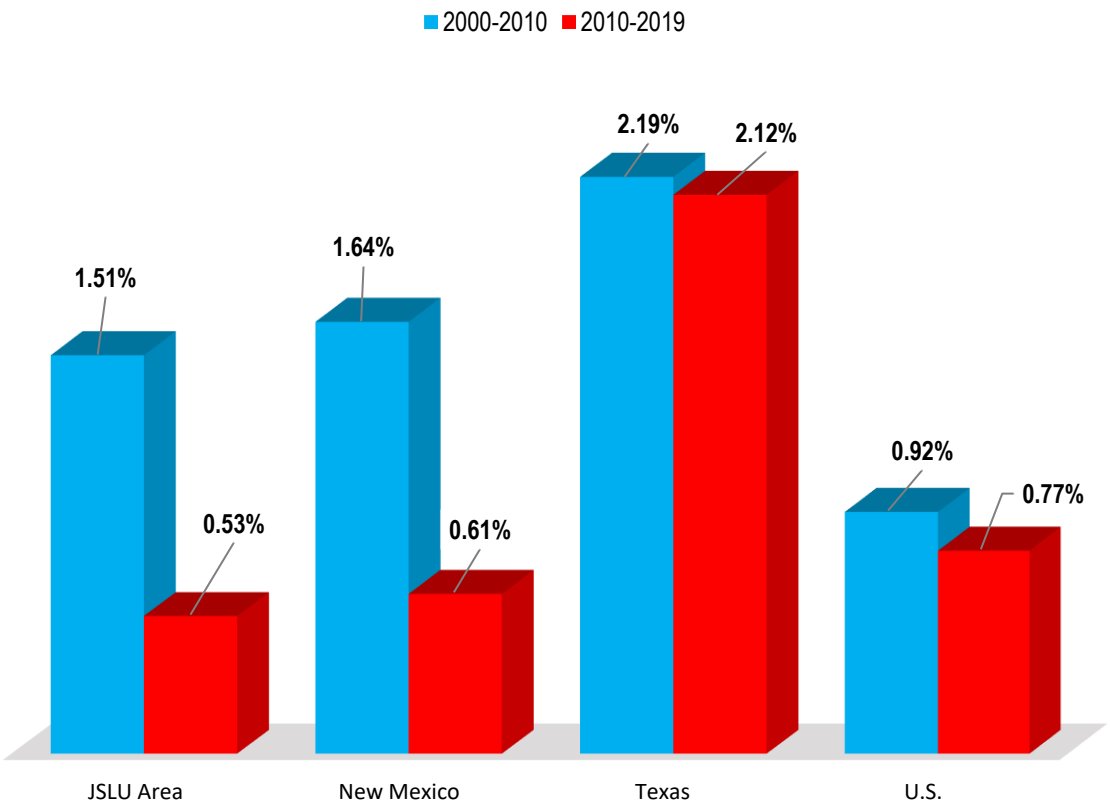
	2000	2010	2019	Growth rate (2000-2010)	Growth rate (2010 -2019)	Growth rate (2000-2019)
San Elizario	11,046	13,603	9,144	2.10%	-4.84%	-1.04%
Socorro	27,152	32013	34,533	1.66%	0.95%	1.34%
Vinton	1,892	1,971	2,043	0.41%	0.45%	0.43%
Total incorporated areas	613,815	719,406	754,899	1.60%	0.60%	1.16%
Total El Paso County	679,622	800,647	840,758	1.65%	0.61%	1.19%
Study Area Total						
Incorporated	775,610	910,311	952,889	1.61%	0.57%	1.15%
Non-incorporated	191,751	213,717	219,431	1.09%	0.33%	0.75%
Total	967,361	1,124,028	1,172,320	1.51%	0.53%	1.07%
Texas (millions)	20.3	25.2	29.8	2.19%	2.12%	2.16%
New Mexico (millions)	1.7	2.0	2.1	1.64%	0.61%	1.18%
U.S. (millions)	282.2	309.3	329.0	0.92%	0.77%	0.86%

Source: Based on data from the U.S. Census Bureau Decennial Census and American Community Survey

Figures 3-1 and 3-2 display compound annual growth rates for 2000 through 2010 and 2010 through 2019 for the U.S., New Mexico, Texas, JLUS region, and incorporated areas in the JLUS region. At a national and regional level, population growth was more robust between 2000 and 2010. Economic conditions during the first half of this period were good, but the financial crisis in 2008 and resulting recession stifled economic migration. Texas, which only saw a slight decline in population growth, was the exception.

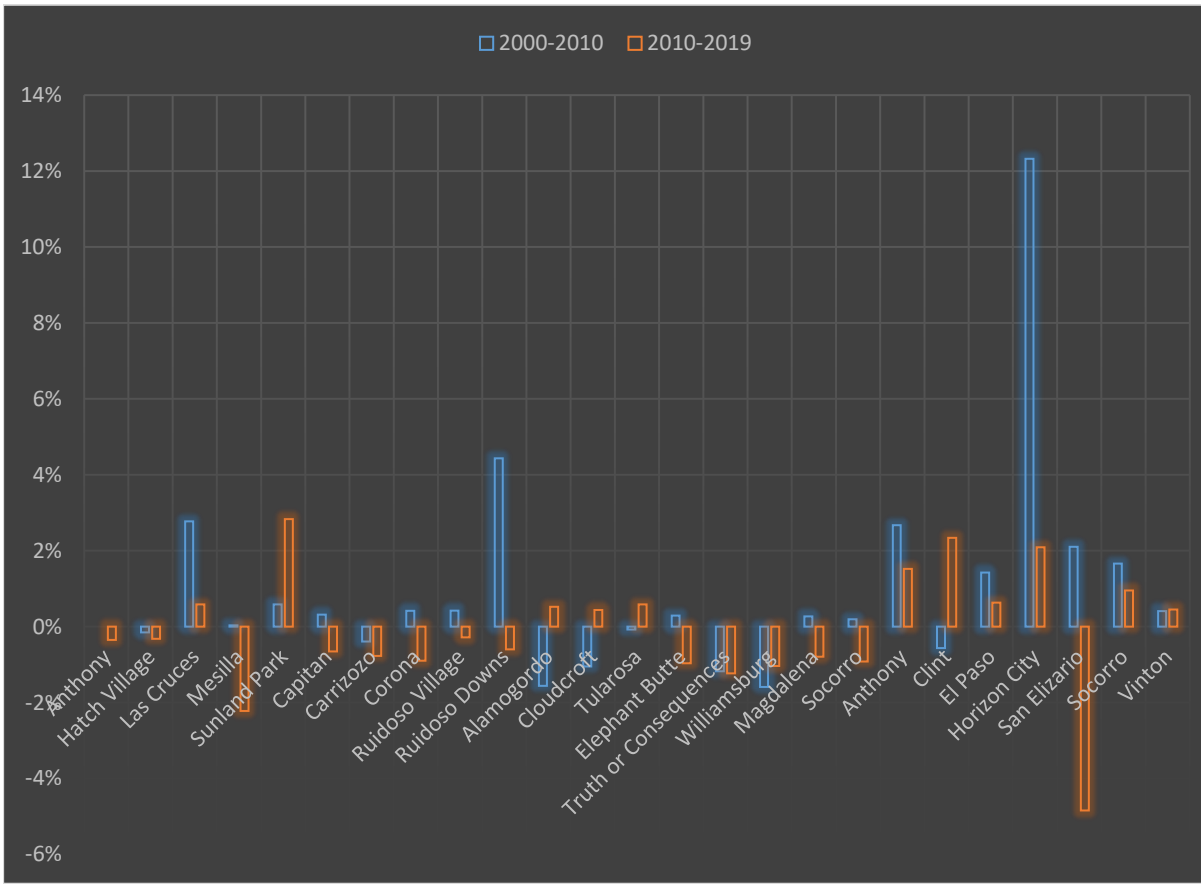
At the local level, growth followed the same general tempered pattern. For example, from 2000 to 2010, Las Cruces grew at rate of nearly 3.0 percent per year, but from 2010 on annual increases dropped to 0.6 percent per year on average. Similarly, El Paso saw a decline from 1.5 percent per year to 0.5 percent. Horizon City (New Mexico), a rapidly growing suburb in the El Paso Metropolitan Statistical Area, saw its population growth rate decline from 12.3 percent per year from 2000 to 2010 to only 2.1 percent in the following decade.

Figure 3-1
Compound Annual Population Growth Rates for JLUS Region, New Mexico, Texas and the U.S.
(2000-2010 versus 2010-2019)



Source: U.S. Based on data from the Census Bureau Decennial Census and American Community Survey

Figure 3-2
Compound Annual Population Growth Rates for Incorporated Areas in the JLUS Region
(2000-2010 versus 2010-2019)



Source: Based on data from the U.S. Census Bureau Decennial Census and American Community Survey

3.2 Households

Table 3-2 compares the number of households and the average number of persons per household for the U.S., New Mexico and Texas, and JLUS study area for decennial years 2000, 2010 and 2019. During the 20-year period, the number of households in the JLUS region increased by 32 percent, while the average number of persons per household fell from 3.24 to 2.98 (7 percent). The only areas where average household size increased were in New Mexico (Lincoln and Otero counties).

Table 3-2
Trends in the Number and Size of Households in the JLUS Region (2000-2019)

Area	2000		2010		2019		Percent increase in households (2000-2019)
	Households	Average persons per household	Households	Average persons per household	Households	Average persons per household	
Dona Ana County (NM)	45,029	3.88	75,532	2.77	80,409	2.71	79%
El Paso County (TX)	210,022	3.24	256,557	3.12	270,160	3.11	29%
Lincoln County (NM)	8,202	2.37	9219	2.22	7,902	2.47	-4%
Otero County (NM)	22,984	2.71	24,464	2.61	23,657	2.82	3%
Sierra County (NM)	6,113	2.17	5,917	2.03	5,400	2.03	-12%
Socorro County (NM)	6,675	2.71	5,996	2.98	6,477	2.58	-3%
JLUS Region	299,025	3.24	377,685	2.98	394,005	2.98	32%
New Mexico	677,971	2.68	791,395	2.60	767,705	2.73	13%
Texas	6,070,937	3.43	8,922,933	2.82	9,776,083	2.94	61%
U.S.	91,947,112	3.06	116,716,292	2.65	121,520,180	2.69	32%

Source: Based on data from the U.S. Census Bureau Decennial Census and American Community Survey

3.3 Age Characteristics

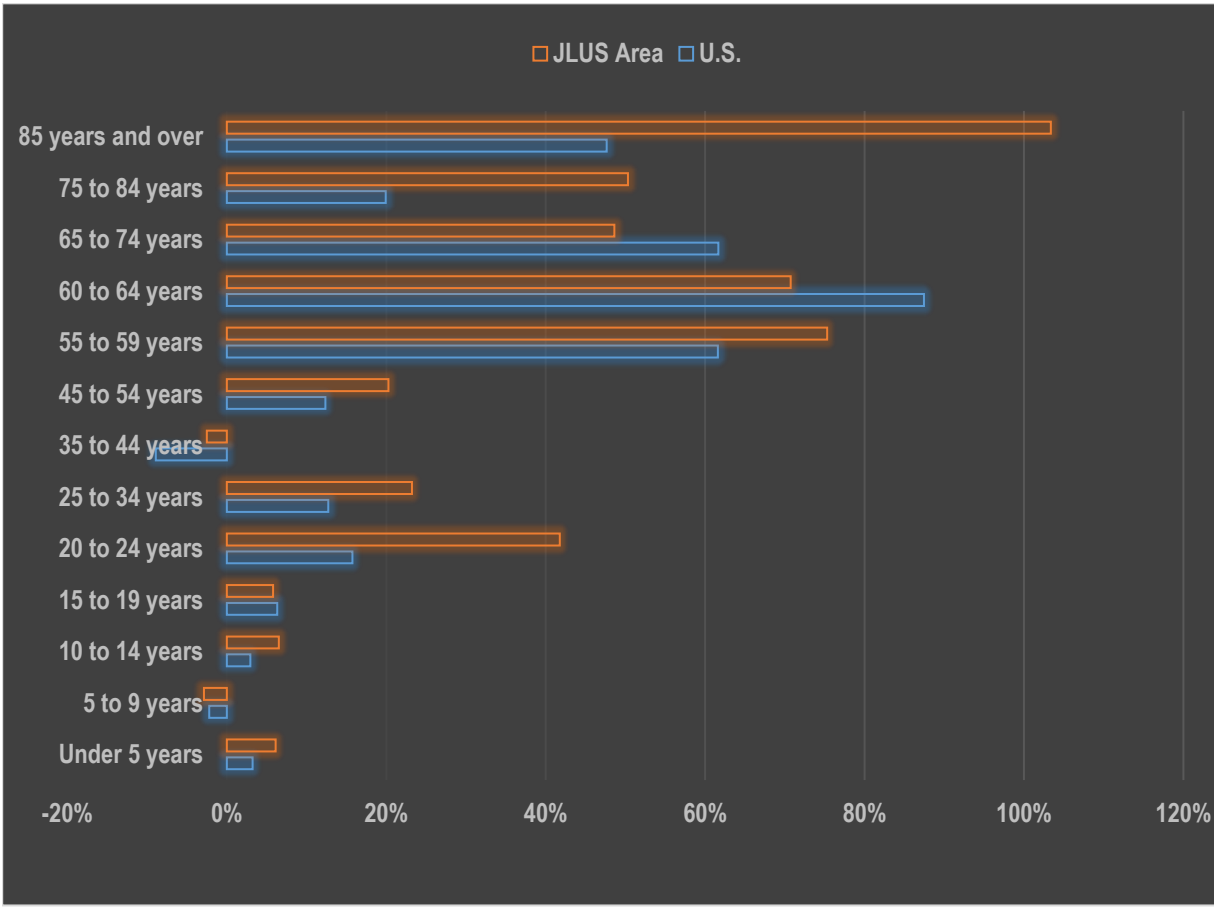
As is the case in many developed nations, people are getting older, living longer and having fewer children, and the JLUS region is no exception (Table 3-3). When compared to the U.S., the median age of JLUS residents grew by 18 percent from 2000 through 2010, but fell sharply from 2010 through 2019 when compared to national estimates (negative 1 percent). Interestingly, as shown in Figure 3-3 growth in the median age of JLUS residents from 2000 through 2019 was heavily weighted toward residents that were 75 years or older, and those in the 20 to 34 years age group. The reason is unclear, but growth in the younger demographic is likely due to the expansion of Ft. Bliss as part of Base Realignment and Closure activities in the first decade of the period.

Table 3-3
Median Age in the U.S. And JLUS Region (2000 through 2019)

Region	2000	2010	2019	Percent change (2000-2010)	Percent change (2010-2019)
U.S.	35.3	37.2	37.8	5%	2%
JLUS Area	27.3	32.2	31.9	18%	-1%

Source: U.S. Census Bureau Decennial Census and American Community Survey

Figure 3-3
Change in Age Distribution in the U.S. and JLUS Region (2000 and 2019)

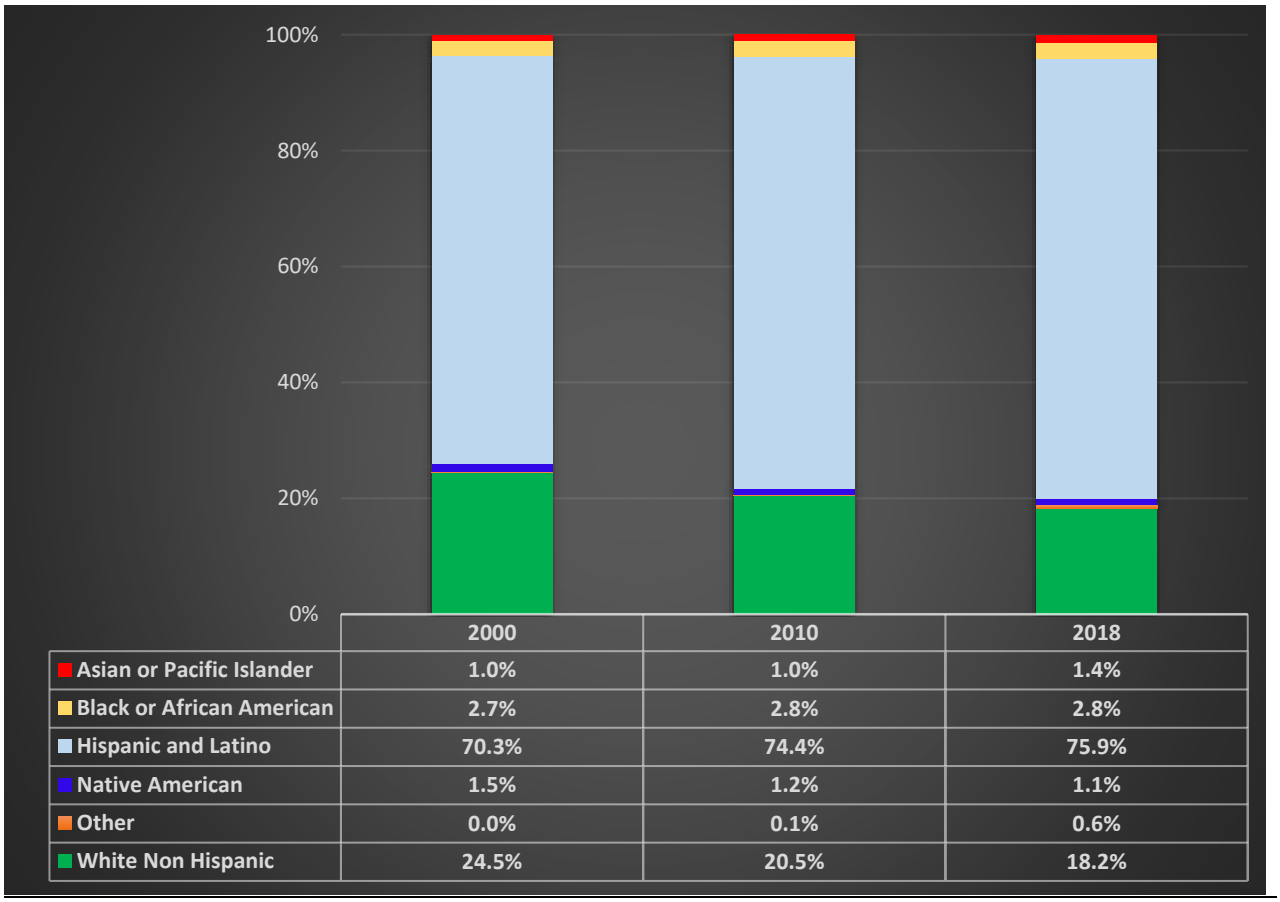


Source: U.S. Census Bureau Decennial Census and American Community Survey

3.4 Racial and Ethnicity Composition

As was the case with data presented in the 2013 report, the proportion of Hispanic and Latino population has increased in the JLUS study area (Figure 3-4). From 2000 through 2019, the region's population describing themselves as Hispanic or Latino population grew from 70 to 76 percent of the total population, while the non-Hispanic white population recorded a corresponding decline of 25 to 19 percent. This shift mirrors similar trends across the U.S. southwest. The percentage of Black and African people remained relatively constant, and the share of Asian or Pacific Islanders grew from 1.0 percent to 1.4 percent.

Figure 3-4
Distribution of Racial and Ethnic Characteristics of Population in JLUS Region (2000 through 2019)



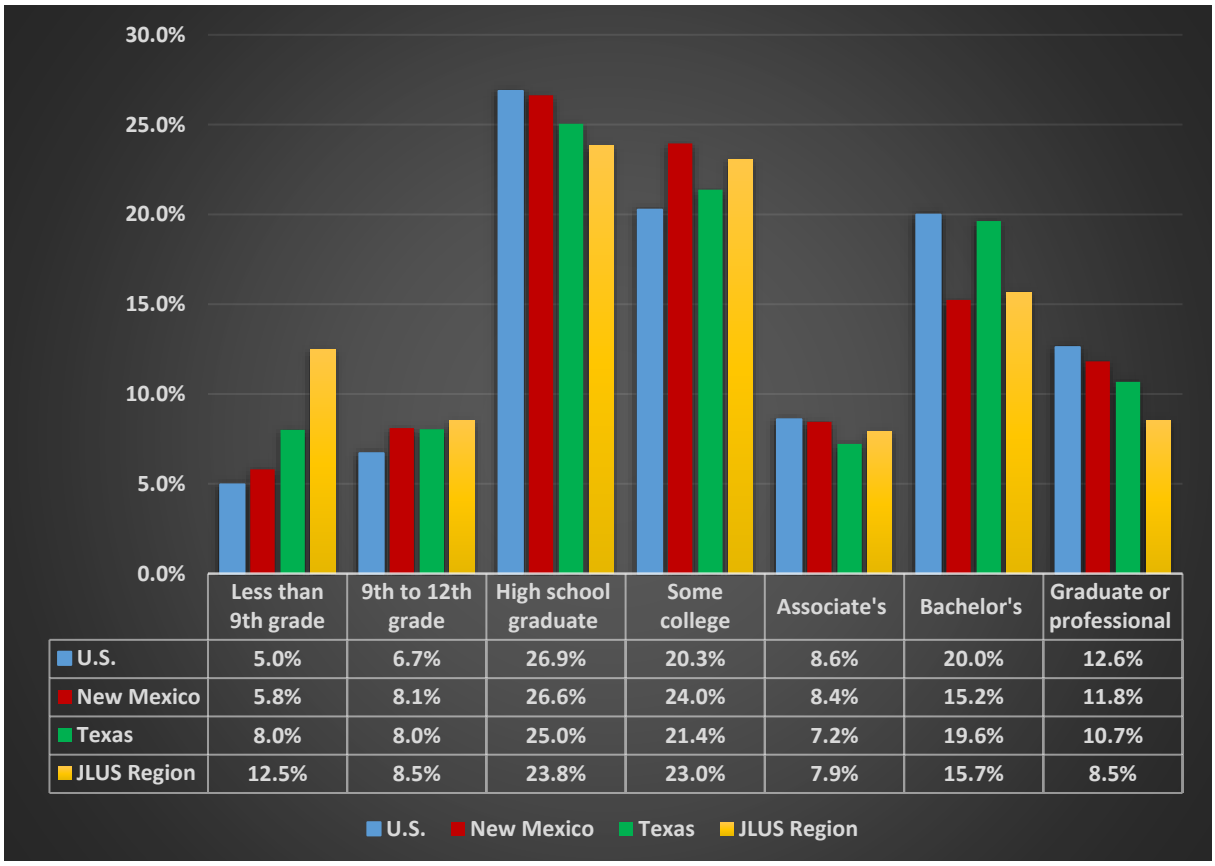
	2000	2010	2018
Asian or Pacific Islander	1.0%	1.0%	1.4%
Black or African American	2.7%	2.8%	2.8%
Hispanic and Latino	70.3%	74.4%	75.9%
Native American	1.5%	1.2%	1.1%
Other	0.0%	0.1%	0.6%
White Non Hispanic	24.5%	20.5%	18.2%

Source: U.S. Census Bureau Decennial Census and American Community Survey

3.5 Educational Attainment

JLUS counties report that 12.5 percent of their combined populations have less than a 9th grade education, compared to 5.0 percent for the nation, 5.8 percent for New Mexico and 8.0 percent of Texas (Figure 3-5). JLUS counties also report lower levels of educational attainment at the high school and graduate school levels than the nation and Texas and New Mexico; however, in the category of some college, no degree, or bachelors JLUS counties had higher educational attainment when compared to at least one other area. Overall, educational attainment data are important indicators of human capital in the JLUS region and demonstrate a potential for targeted training programs such as vocational courses and apprenticeships. With 8.2 percent of the regional population reporting less than a 9th grade education, the numbers also indicate a large school dropout rate, and may provide opportunities for expanded outreach programs to encourage high school completion including military programs such as the Junior Reserve Officer Training Program.

Figure 3-5
Distribution of Educational Attainment in the U.S., New Mexico, Texas and JLUS Counties for Persons 25 Years and Older (2019)



	Less than 9th grade	9th to 12th grade	High school graduate	Some college	Associate's	Bachelor's	Graduate or professional
U.S.	5.0%	6.7%	26.9%	20.3%	8.6%	20.0%	12.6%
New Mexico	5.8%	8.1%	26.6%	24.0%	8.4%	15.2%	11.8%
Texas	8.0%	8.0%	25.0%	21.4%	7.2%	19.6%	10.7%
JLUS Region	12.5%	8.5%	23.8%	23.0%	7.9%	15.7%	8.5%

Source: U.S. Census Bureau Decennial Census and American Community Survey

4.0 Regional Economy

Section 4.0 discusses commonly referenced economic indicators at the national, regional and local level. Statistics discussed include gross domestic product, per capita income and household income, labor force characteristics, employment diversity and unemployment.

4.1 Real Gross Domestic Product

Gross domestic product (GDP) is the market value of all final goods and services produced by an economy whether it be local, regional, national or global; and although it does not measure income equality, it is the standard metric for measuring the size or prosperity of any economy. Basically, in a given year it is capital measured in dollars that an economy creates that stays in the same economy (at least initially) in the form income to workers, businesses and shareholders, business profits, and tax revenues for public sectors.

GDP is also referred to “value added” because it only counts the incremental or marginal value of physical goods produced in an economy as goods move through a supply chain. For example, a famer sells a bushel of grain to mill for $10, and the mill makes a few pounds of flour that it then sells it to a bakery for $20, and the bakery makes 10 loaves of bread and sells it to its customers for $30. GDP for this supply chain would capture ($30 minus $20 minus $10) for a total of $30 versus counting total revenues for each business ($60). In other words, GDP does not double count the value of goods.

Table 4-1 compares real GDP for the JLUS area and the U.S., New Mexico and Texas. Real GDP over a period of time measures the true value of an economy's output using prices from a fixed base year, and captures real economic growth since the effects of inflation (or less commonly deflation) have been removed. From 2000 through 2019, the U.S. economy grew at an annual average rate of 2.1 percent, and Texas grew by 2.9 percent per annum. New Mexico was lower at 1.5 percent. Overall, the JLUS regional economy grew at a rate slightly higher than New Mexico (1.9 percent) that was in large part driven by growth in the El Paso metropolitan statistical area. As shown in Figure 3-6, growth in other JLUS counties was lower ranging from 0.4 percent in Sierra County to 1.7 percent in Dona Ana County.

Table 4-1
Real Gross Domestic Product for the U.S. And JLUS Region
(Constant 2012 price level, 2000 through 2018)

Area`	2000	2010	2018	Growth rate (2000-2018)
Dona Ana County (NM)	$4,949	$7,018	$6,757	1.7%
El Paso County (TX)	$20,024	$25,435	$28,974	2.1%
Lincoln County (NM)	$507	$585	$591	0.9%
Otero County (NM)	$2,111	$2,582	$2,526	1.0%
Sierra County (NM)	$263	$293	$283	0.4%
Socorro County (NM)	$419	$495	$477	0.7%
JLUS Region	$28,273	$36,408	$39,609	1.9%
New Mexico	$72,053	$87,004	$93,605	1.5%
Texas	$1,021,889	$1,301,727	$1,712,764	2.9%
U.S.	$13,130,987	$15,598,754	$19,072,505	2.1%

Source: Based on data from the Bureau of Economic Analysis data retrieved from the FRED Economic Data published by the Federal Reserve Bank of St. Louis

4.2 Real Per Capita Income

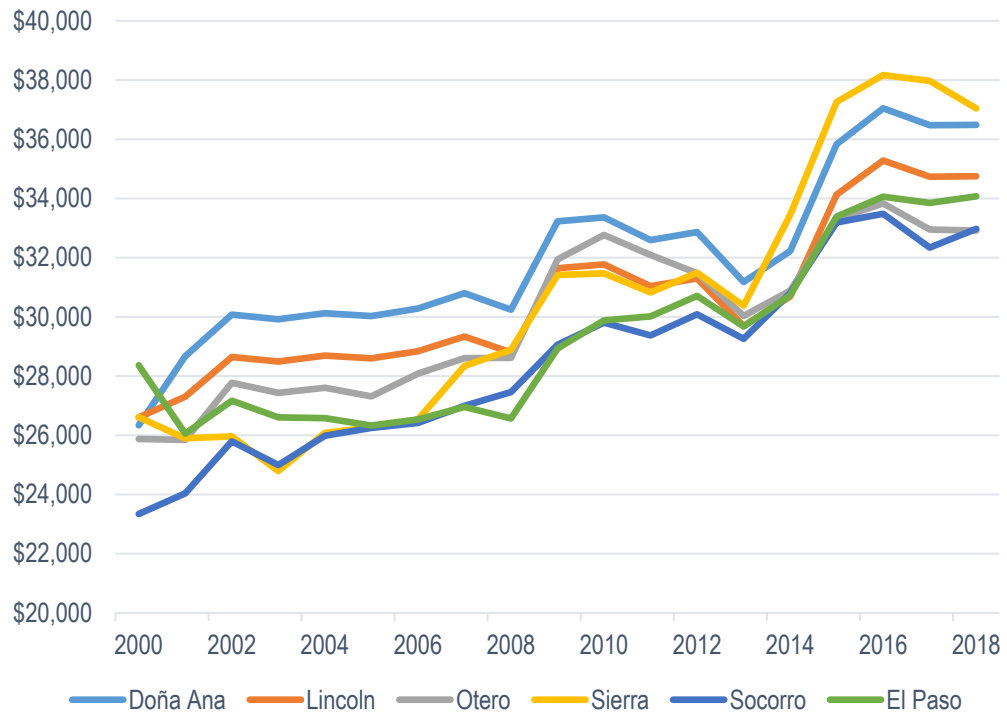
Real per capita income is another measure of relative economic performance. Typically, rates of economic growth (negative or positive) are gauged by comparing regional rates with national averages over time, with the hope that poor or under-performing areas move closer to the average. Table 4-2 and Figure 4-1 compare real per capita income at the national, state and regional level from 2000 through 2018. Data were adjusted for cost of living using composite multipliers from the U.S. Census Bureau's Cost of Living Index for Selected Urban Areas, and are reported in constant year 2012 price levels. At the regional and state level, 2018 figures are more or less consistent with New Mexico showing a slightly higher value than Texas or any JLUS county, and all areas have demonstrated positive growth from 2000 through 2018. National level real per capita income was higher than any other area reflecting large numbers of very wealthy individuals in states other than Texas and New Mexico (i.e., the presence of ultra-wealthy individuals in certain regions that skew the data).

Table 4-2
Real per Capita Income for the U.S. And JLUS Region
(Constant 2012 price levels, 2000, 2010 and 2018)

Area	2000	2010	2018`	Growth rate (2000-2018)
Dona Ana County (NM)	$26,335	$33,360	$36,487	1.8%
El Paso County (TX)	$26,603	$33,360	$36,487	1.8%
Lincoln County (NM)	$25,875	$34,405	$34,557	1.6%
Otero County (NM)	$26,611	$33,044	$38,895	2.1%
Sierra County (NM)	$23,338	$31,291	$34,620	2.2%
Socorro County (NM)	$28,360	$32,866	$37,478	1.6%
JLUS Region	$25,928	$32,805	$36,137	1.9%
New Mexico	$32,966	$37,056	$41,514	1.3%
Texas	$27,071	$31,372	$35,774	1.6%
U.S.	$41,398	$42,631	$51,787	1.3%

Source: Based on data from the Bureau of Economic Analysis data retrieved from the FRED Economic Data published by the Federal Reserve Bank of St. Louis

Figure 4-1
Real per Capita Income in JLUS Region by County (2000 through 2018)



Source: Based on data from the Bureau of Economic Analysis data retrieved from the FRED Economic Data published by the Federal Reserve Bank of St. Louis

4.3 Labor Force and Unemployment

From 2007 through 2018, total full and part-time employment in the JLUS region grew at an average annual rate of 1.4 percent, which was higher than national and state level values (Table 4-3). Among JLUS counties, Otero, Sierra, Lincoln and Socorro counties reported declines in total employment levels with a large drop occurring in Socorro County. Although not directly shown in Table 4-3, employment in these four counties and in the U.S. in general declined sharply in 2008 through 2010 (16 percent drop for the four counties) in response to the 2008 financial crisis or "great recession" when employment in the housing and related markets plummeted.

Figure 4-2 illustrates trends in the number of people employed at regional, state and national levels. Actual figures were indexed to value of 1.0 in 2007 for graphic scaling and comparison. Paradoxically, employment in the JLUS region actually increased during the great recession (2009 and 2010), and growth was driven by the El Paso labor market. Congress might not have known it then, but its move to expand Fort Bliss as part of changes recommended by the Base Realignment and Closure Commission saved El Paso from falling into the depths of the 2009 economic recession. Whereas home construction dropped to record lows across most of the U.S., El Paso experienced relatively robust growth. In fact, an influx of Soldiers, military personnel and their families created a shortage of housing units on the base, helping drive up demand for housing and developers.[1]

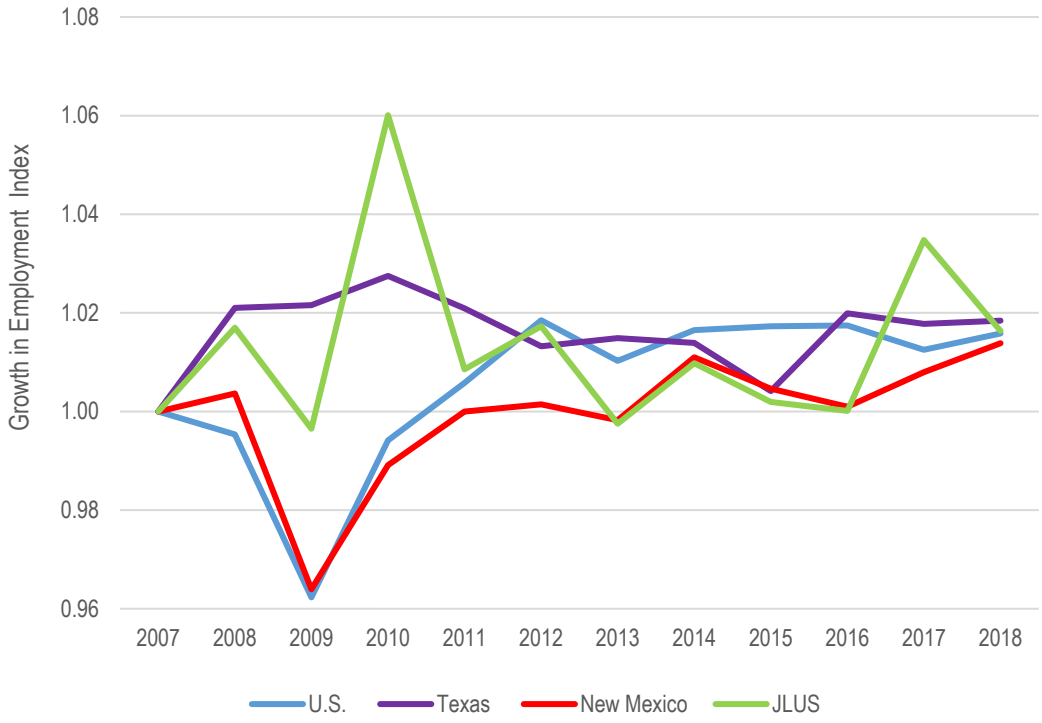
Table 4-3
Persons Employed for the U.S. And JLUS Region
(2007, 2012 and 2018)

Area	2007	2012`	2018	Growth rate (2007-2018)
El Paso County (TX)	274,246	313,903`	343,915	2.08%
Dona Ana County (NM)	83,322	86,338	89,129	0.61%
Lincoln County (NM)	10,547	8,493	8,306	-2.15%
Otero County (NM)	25,003	23,004	23,398	-0.60%
Sierra County (NM)	5,349	3,505	3,808	-3.04%
Socorro County (NM)	9,050	6,318	6,112	-3.51%
JLUS Region	407,517	441,561	474,668	1.40%
New Mexico	899,004	860,301	893,566	-0.06%
Texas	11,436	11,676	11,928	0.38%
U.S.	146,050	139,885	155,764	0.59%

Source: Based on data from the Bureau of Labor Statistics data retrieved from the FRED Economic Data published by the Federal Reserve Bank of St. Louis

[1] Tseng, N.H. "How El Paso, Texas dodged the recession." Fortune Magazine, November 16, 2010.

Figure 4-2
Change in the Number of Persons Employed in the JLUS Region, New Mexico, Texas and U.S.
(Values indexed to base of 1.0 in 2007)



Source: Based on data from the Bureau of Labor Statistics data retrieved from the FRED Economic Data published by the Federal Reserve Bank of St. Louis

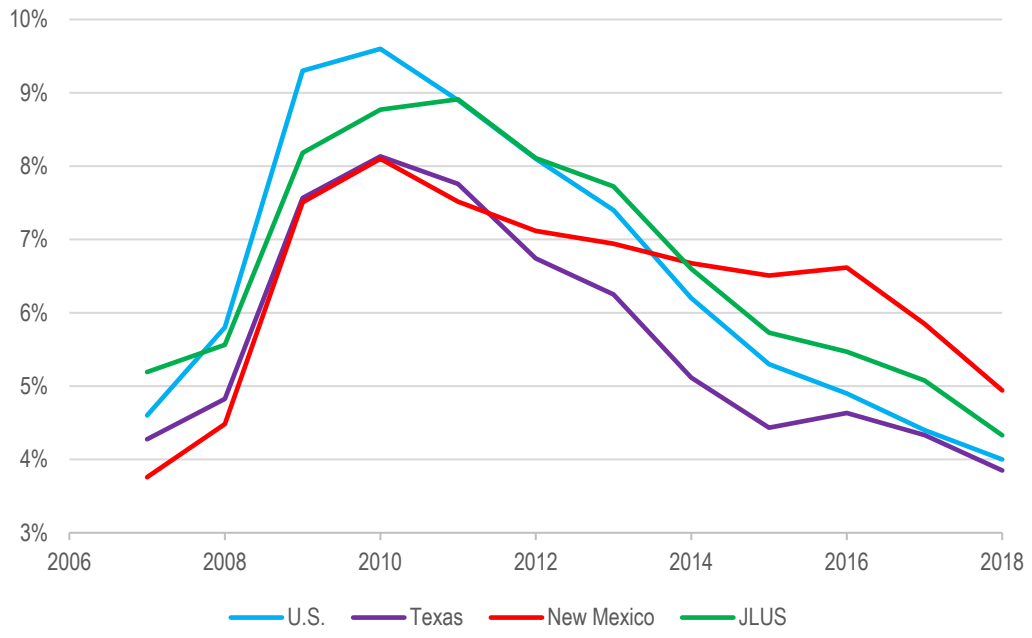
Unemployment rates follow the same general trend (Table 4-4 and Figure 4-3). In 2007, the average unemployment rate across the six counties that make up the region was 5.2 percent, which was higher than state and national averages at the time. In 2012, it ballooned to 8.5 percent following the financial crisis and its repercussions. In Sierra County, unemployment grew to almost 10 percent, which was the worst level since the Great Depression of the 1930s. From 2012 through 2018, unemployment fell dramatically in large part due to federal stimulus packages following the financial crisis, record low interest rates and federal tax cuts.

Table 4-4
Persons Employed and Percent Unemployed for the U.S. And JLUS Region (2007, 2012 and 2018)

Area	2007		2012		2018	
	Number employed	Percent unemployed	Number employed	Percent unemployed	Number employed	Percent unemployed
El Paso County (TX)	274,246	5.8%	313,903	8.5%	343,915	4.2%
Dona Ana County	83,322	4.2%	86,338	7.3%	89,129	5.7%
Lincoln County	10,547	3.1%	8,493	6.5%	8,306	4.6%
Otero County	25,003	3.8%	23,004	6.5%	23,398	4.9%
Sierra County	5,349	3.5%	3,505	9.8%	3,808	7.1%
Socorro County	9,050	3.2%	6,318	7.0%	6,112	5.3%
JLUS Region	407,517	5.2%	441,561	8.1%	474,668	4.6%
New Mexico	899,004	3.8%	860,301	7.1%	893,566	4.9%
Texas (1000s)	11,436	4.3%	11,676	6.7%	11,928	3.9%
U.S. (1000s)	146,050	4.6%	139,885	8.1%	155,764	4.0%

Source: Based on data from the Bureau of Labor Statistics data retrieved from the FRED Economic Data published by the Federal Reserve Bank of St. Louis

Figure 4-3
Average Annual Unemployment Rate for the JLUS Region, New Mexico, Texas and the U.S. (2007 through 2019)



Source: Based on data from the Bureau of Labor Statistics data retrieved from the FRED Economic Data published by the Federal Reserve Bank of St. Louis

4.4 Labor Market Characteristics

Table 4-5 compares employment by economic sector in the U.S. with the JLUS region. The total number of people employed has increased in both the U.S. and JLUS region, although the percentage change in persons employed in the JLUS region from 2010 through 2018 was lower than the nation (14 percent versus 10 percent). The largest area of decline in the region was the federal government sector (a loss of about 1,200 part and full time jobs), a decline that mirrored a 6 percent drop in federal employment at the national level.

The impetus for the reported drop in federal jobs by the Bureau of Labor Statistics is unclear, but it may be related to a decline in temporary regional employment related to expansion projects at Ft. Bliss that ended around 2010. In contrast, the JLUS region made significant gains in the leisure and hospitality sector, and the trade, transportation and utilities sector. Table 4-6 displays total real wages over the same period. Unlike the number of persons employed, growth in real wages was positive for the JLUS region, but was somewhat lower than national level figures (a percent change of 10 versus 14 percent). The discrepancy is due to the fact that since about 2016, wage growth in the U.S. has been strong across most sectors, thereby offsetting lost wages associated with modest declines in the number of regional jobs.

Tables 4-5 and 4-6 contain a metric referred to as a location quotient that measures how unique or concentrated an industry and or occupation is in a regional economy when compared to the national economy. For example, if coal mining accounts for 2.5 percent of jobs in a given county, but only 1 percent of jobs nationally, then the local coal industry has an location quotient of 2.5 meaning that the coal industry is 2.5 times more concentrated in the county versus the nation. Industries with a high location quotient are often (but not always) “export” or “base” industries, which are important because they generally bring money into a region, rather than circulating local dollars through an economy, which is typical for service sectors such as retail businesses or food services. Occupations with a high location quotient are also important because they are generally employed by high location quotient industries, and provide a workforce-oriented perspective of a region’s economic base. Such occupations are vital for continued economic prosperity of a region.

Figure 4-4 displays locations quotients by number of jobs and total wages for different sectors in the JLUS region. Again, values greater than one indicate that a sector is more concentrated in the region versus the nation as whole. By far, the sector with the largest location quotient (wages and numbers of jobs) is the federal government; the second largest is natural resources and mining, and lastly state government is the third largest. A decline in revenues or funding for any of these sectors would have *significant* repercussions for the JLUS regional economy.

Table 4-5
Number of Persons Employed by Industry in the U.S and JLUS Region (2010 and 2018)

Industry	U.S.			JLUS Region			
	2010	2018	Percent change (2010-2018)	2010	2018	Percent change (2010-2018)	Location quotient*
Construction	5,489,499	7,225,870	32%	20,828	20,667	-1%	1.02
Education and Health Services	18,656,160	22,632,823	21%	68,272	79,526	33%	1.05
Federal Government	2,980,813	2,795,195	-6%	38,976	42,976	-7%	2.45
Financial Activities	7,401,812	8,187,308	11%	14,814	15,927	6%	0.69
Information	2,703,886	2,815,363	4%	6,268	5,328	-15%	0.69
Leisure and Hospitality	13,006,814	16,196,857	25%	39,501	49,498	25%	1.13
Local Government	14,032,396	14,159,744	1%	59,527	60,727	2%	1.55
Manufacturing	11,487,496	12,647,900	10%	29,962	31,587	-3%	0.58
Natural Resources and Mining	1,798,592	1,937,219	8%	5,213	4,949	-5%	2.90
Other Services	4,349,563	4,501,913	4%	10,497	11,762	3%	0.71
Professional and Business Services	16,712,011	20,872,036	25%	42,102	47,933	8%	0.77
State Government	4,606,001	4,624,977	0.4%	18,704	18,015	-4%	1.72
Trade, Transportation, and Utilities	24,442,734	27,406,633	12%	73,183	85,443	16%	1.08
Unclassified	152,667	127,916	-16%	146	330	126%	1.23
Total	127,820,444	146,131,754	14%	427,993	474,668	10%	NA

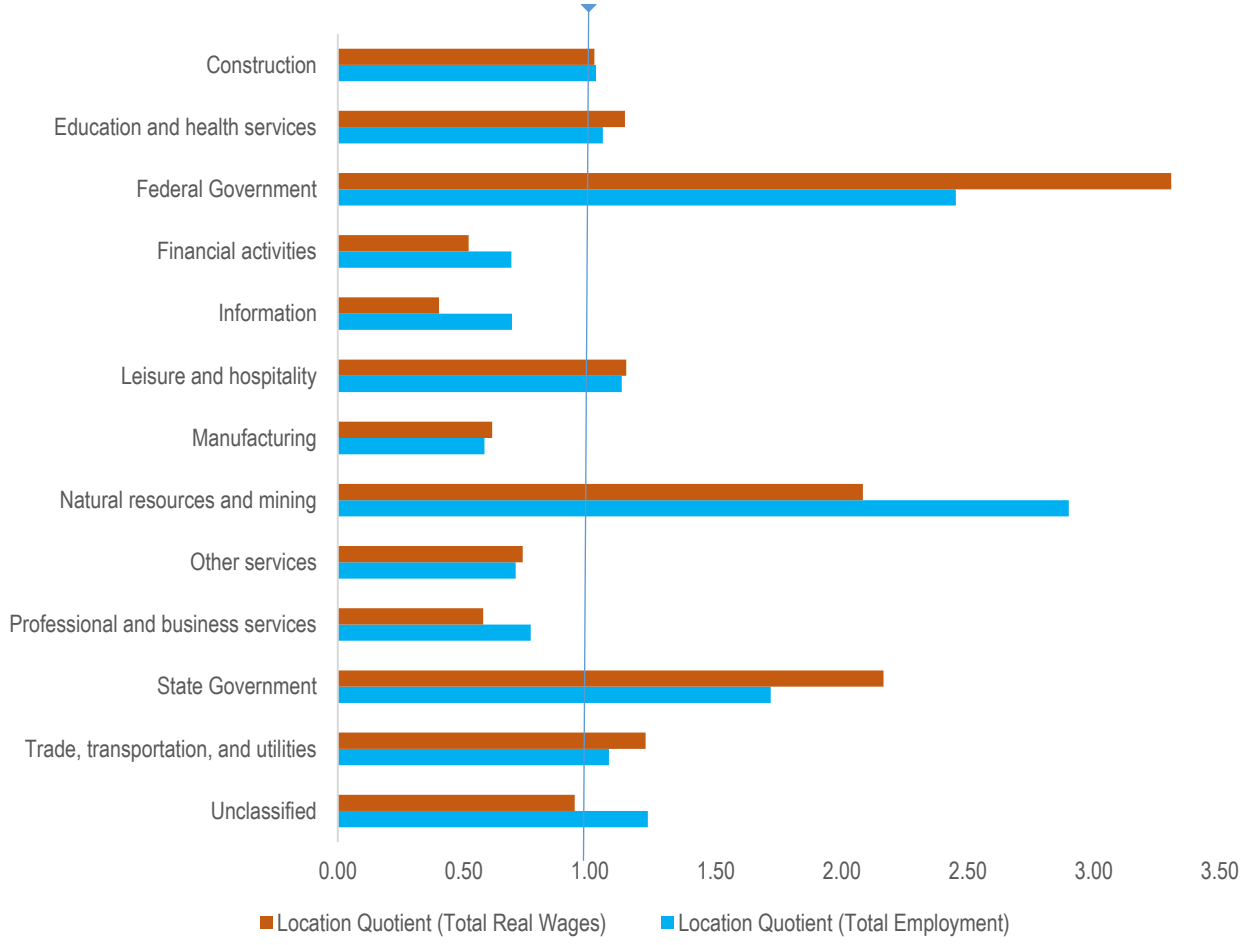
"NA" = not applicable. Source: Bureau of Labor Statistics

Table 4-6
Total Real Wages by Industry in the U.S and JLUS Region (2010 and 2018)

Industry	U.S. ($millions)			JLUS Region ($millions)			
	2010	2018	Percent change (2010-2018)	2010	2018	Percent change (2010-2018)	Location quotient*
Construction	$855,904	$1,084,839	27%	$745	$820	10%	1.14
Education and Health Services	$217,024	$222,195	2%	$2,422	$2,764	14%	3.31
Federal Government	$576,122	$743,436	29%	$2,635	$3,171	20%	0.52
Financial Activities	$211,648	$304,386	44%	$576	$732	27%	0.40
Information	$265,322	$370,703	40%	$269	$311	16%	1.14
Leisure and Hospitality	$642,147	$693,120	8%	$580	$752	30%	1.90
Local Government	$695,293	$823,550	18%	$2,374	$2,453	3%	0.61
Manufacturing	$94,280	$109,762	16%	$1,300	$1,456	12%	2.08
Natural Resources and Mining	$134,408	$164,541	22%	$121	$134	11%	0.73
Other Services	$1,057,573	$1,490,808	41%	$236	$301	28%	0.58
Professional and Business Services	$237,273	$266,982	13%	$1,403	$1,764	26%	2.17
State Government	$1,005,779	$1,239,778	23%	$808	$874	8%	1.22
Trade, Transportation, and Utilities	$8,119	$6,956	-14%	$2,279	$2,922	28%	0.94
Unclassified	$6,287,356	$7,951,744	26%	$3	$9	200%	NA
Total	$855,904	$1,084,839	27%	$15,752	$18,374	17%	NA

"NA" = not applicable. Source: Bureau of Labor Statistics

Figure 4-4
Location Quotients for Total Annual Wages and Employment in the JLUS Region*



* Values greater than one indicate that a sector is more concentrated in the region versus the nation as whole, and indicate that a sector is an economic base for the region. Base industries generally bring in money from outside the region, and in large part support many other businesses in a region such as service industries (e.g., retail and food service). Source: Based on employment data from the U.S. Bureau of Labor Statistics.

Table 4-7
Average Annual Real Wages by Industry in the U.S and JLUS Region (2010 and 2018, constant 2012 price levels)

Industry	U.S.			JLUS Region		
	2010	2018	Percent change (2010-2018)	2010	2018	Percent change (2010-2018)
Construction	$52,184	$59,604	14%	$35,784	$39,679	11%
Education and Health Services	$45,878	$47,932	4%	$35,478	$34,752	-2%
Federal Government	$72,807	$79,492	9%	$67,595	$73,797	9%
Financial Activities	$77,836	$90,803	17%	$38,892	$45,978	18%
Information	$78,275	$108,116	38%	$42,945	$41,582	-3%
Leisure and Hospitality	$20,398	$22,888	12%	$14,694	$15,193	3%
Local Government	$45,762	$48,950	7%	$39,873	$40,393	1%
Manufacturing	$60,526	$65,113	8%	$43,403	$46,094	6%
Natural Resources and Mining	$52,419	$56,659	8%	$23,288	$27,126	16%
Other Services	$30,902	$36,549	18%	$22,473	$25,559	14%
Professional and Business Services	$63,282	$71,426	13%	$33,326	$36,809	10%
State Government	$51,514	$57,726	12.1%	$43,187	$48,489	12%
Trade, Transportation, and Utilities	$41,149	$45,237	10%	$31,143	$34,194	10%
Unclassified	$53,179	$54,378	2%	$19,538	$28,173	44%
Total	$52,184	$59,604	14%	$35,784	$39,679	11%

Source: Based on data from the Bureau of Labor Statistics

Another metric similar to a location quotient is employment diversity across industries, which is an important factor when evaluating the resilience of a local economy in the context of the old adage "don't put all of your eggs in one basket." Economies that are heavily diversified are better able to weather economic downturns that affect specific industries such as real estate, construction or agriculture. To measure employment diversity, this report relies on an index developed by Chmura Economics & Analytics JobsEQ.[2] Specifically, this index measures the industry employment mix of a region in comparison to that of the U.S. with the nation being the most economically diverse region with an index value of 1.00. A relatively low index value implies that a region is economically diverse, while a high value means a region is not economically diverse.

[2] Chmura's economic diversity analysis computes the Economic Diversity Index for every county and MSA at the 6-digit NAICS level even when employment suppression issues make it difficult to find data for all industries. While the Bureau of Labor Statistic's county-level dataset is bound by non-disclosure rules, Chmurs's analysis uses JobsEQ employment data that incorporates additional sources and methodologies to provide a complete employment dataset of all regions, making a thorough Economic Diversity Index calculation possible.

Estimated Diversity Index Values for JLUS counties are:

- El Paso County (0.576)
- Doña Ana County (0.667)
- Lincoln County (0.889)
- Sierra County (1.18)
- Otero County (1.053)
- Socorro County (1.018)

Among JLUS counties, El Paso County demonstrates the greatest diversity followed by Dona Ana and Lincoln counties, while Otero, Sierra and Socorro counties have the lowest diversity in employment indicating that their local economies are especially vulnerable to economic downturns.

4.7 Poverty Indicator

In regard to poverty, an indicator referred to as the "rich-to-poor ratio" highlights income inequality distribution or the gap between rich and poor. The ratio is based on the number of current households with incomes less than $25,000 compared to the number of households with incomes of $100,000 or more. In 2019, on a national level the ratio was 1.10 indicating that there were more households making less than $25,000 versus households making $100,000 per year or more (Table 4-8) In general, the ratio has been increasing in last few decades. On a state and local level, the ratio is generally higher, particularly at a local level. For Texas, the figure is 1.25 and for New Mexico 1.72. For JLUS counties, values range from a high of 2.79 in El Paso County to 1.70 in Socorro County.

Table 4-8
Ratio of the Number of Households Earning Less than $25,000 per Year versus the Number of Households Earning at Least $100,000 Annually

U.S.	Texas	New Mexico	JLUS Counties					
			El Paso	Dona Ana	Lincoln	Otero	Sierra	Socorro
1.10	1.25	1.72	2.79	2.23	2.56	2.10	1.90	1.70

Source: Derived from U.S. Census American Community Survey Data

5.0 Regional Economic Analysis of JLUS Military Installations

An important objective of this report is to provide JLUS partners, and military and local officials with estimates of how spending by the region's three military installations (Fort Bliss, Holloman AFB, and White Sands Missile Range) affect local economies and the broader regional economy. Section 5.0 discusses the methodology and assumptions underlying the analysis and presents results.

5.1 General Overview of Regional Economic Analysis and Input Output Models

Regional economic analysis measures the effects of an economic activity or event on a specific geographic area. For example, policy makers or business leaders may want to know how a proposed manufacturing plant would affect a regional economy, or conversely, they may want to know how closing a plant or military base would affect a community. In some cases, federal and state laws require economic impact studies before implementing a policy or project or changing tax policies. Regardless of the reason, impact studies provide useful information for guiding economic development and or to mitigate potential negative impacts. Economic impact analysis is an important decision making tool that can enhance the quality of decisions made, as well as the decision making process in both public and private sectors.

Basically, economic impact models are accounting frameworks for a predefined geographic area that measure how goods and services flow through different economic sectors including industries, households and governments. Spending, or the lack of spending by these sectors, is the primary driver in an impact model. Spending circulates throughout an economy several fold. Consequently, this spending stimulates aggregate demand, supports jobs, generates household income, and provides tax revenue for governments.

As is the case with the 2013 JLUS study, U.S. Army Corps of Engineers (USACE) used the IMPLAN (Impact Analysis for Planning) economic model to construct a model of the regional economy. IMPLAN is a commonly used economic input-output (I-O) model. I-O models are constructed based on the concept that all industries in an economy are linked, and the output of one industry becomes the input of another industry until all final goods and services are produced. I-O models can be used to analyze the structure of the economy and estimate the total economic impact of changes in an economy, or estimate existing relationships and inter-linkages between different economic sectors.

To understand how the economy is affected by an economic sector such as military installations, one must consider how different sectors or industries in an economy are linked. For example, a processing mill buys corn from the agriculture sector; which in turn, buys inputs from other suppliers such as fertilizer and pesticide producers that also purchase products from a range of other industries. These are referred to as backward linkages. For many goods producing sectors, there are forward supply chain linkages, but not for military installations, which are final demand sectors. In other words, military installations are a final link or terminus in economy's supply chain.

The household sector is connected to all other sectors as it provides labor and management resources. In turn, changes that affect household income typically have significant impacts compared to a change in the sales of other sectors. This is because households spend a large portion of their disposable income on both retail and service goods, both of which are important components of a regional economy.

Linkages in an economy are measured using economic multipliers. Multipliers measure three types of impacts: direct, indirect, and induced impacts:

- **Direct effects** are the known levels of activity or predicted changes in an economy. For example, direct employment at Fort Bliss consists of Soldiers and civilians who work at the base and are paid by the federal government.

- **Indirect effects** are business-to-business transactions required to produce direct effects (i.e., increased output from businesses providing intermediate inputs). For instance, Holloman AFB purchases some goods and services from businesses in the region such as contractors and other service providers that in turn purchase inputs for their own business with earned revenues.

- **Induced effects** derive from spending on goods and services by people working to satisfy direct and indirect effects (i.e., household spending).

Multipliers are calculated from I-O models that are constructed from data for a specified geographic area. The economy in question is divided into a number of producing industries or sectors that sell and purchase goods and services to and from each other, and these inter-industry purchases and sales are key data in I-O models. Sector goods and services are purchased by domestic households, international customers in the form of exports, government (federal, state, and local), and for private sector investment. Purchases that are not part of an economy's supply chain are final demand. For example, wheat farmers sell wheat to mills that produce flour and sell it to food manufacturers and bakers that make bread. Those food manufacturers then sell the bread to wholesale and retail outlets, and ultimately consumers purchase the bread to eat. Consumer purchases are final demand.

For an economy with n sectors, if X_i represents total output for sector i, Y_i represents final demand for sector i products, and z_{ij} represent inter-industry flows, then:

$$X_i = \sum_{j=1}^{n} z_{ij} + Y_i \qquad (1)$$

If a_{ij} represents the I-O technical coefficients where $a_{ij} = z_{ij} / X_j$ so that sectors use inputs in fixed proportions (i.e., constant returns to scale Leontief production function) then the above equation becomes:

$$X_i = \sum_{i=1}^{n} a_{ij} X_i + Y_i \qquad (2)$$

The standard formulation of the basic I-O model and its application, in matrix notation is:

Transactions balance: $X = AX + Y$ (3)

Solving for X: $X = (I - A)^{-1}Y$ (4)

For a change in Y: $\Delta X = (I - A)^{-1}\Delta Y$ (5)

where X is the gross output column vector, A is the matrix of fixed I-O coefficients, Y is the final demand column vector, and I is the identity matrix. This model measures changes in output given changes in final demand (i.e., consumption, investment, government, or exports). The Leontief inverse, $(I - A)^{-1}$, provides the I-O multipliers used to determine impacts. Elements of the matrix are very useful and important as each number in the matrix represents a series of direct and indirect effects. Gross output requirements are translatable into employment coefficients in a diagonal matrix that one can use with the Leontief inverse to estimate employment impacts. Similar calculations produce value-added (GDP) and income multipliers.

When using IMPLAN an important consideration is the definition of the geographic area used in a study. Economies often extend beyond political boundaries, and workers and their incomes and transactions among industries flow across political boundaries. Thus, some indirect effects are likely to occur beyond the geographic region under study. These are called leakages, as opposed to linkages (supplier-purchaser relationships) within a region, and smaller geographic regions such as counties will have more leakages. In contrast, a larger area such as a state or nation will have relatively fewer leakages.

IMPLAN models generate a range of economic indicators that describe an economy, but the most commonly used are output, value added, labor income (also known as household earnings), and employment:

- **Gross output** for private sectors is the value of production for all industries in an economy measured by gross sales revenues (i.e., business sales revenues). For government sectors, output captures labor income and other non-labor related expenses such as operation and maintenance costs, new construction and general non-labor contracting.

- **Value added** is the total value of goods and services produced by businesses in an economy. Generally referred to as gross domestic product (GDP), it is the sum of labor income, taxes paid by industries and households, and other property type income such as corporate profits. Value added including labor income and employment represent the net economic benefit that accrues to an economy.

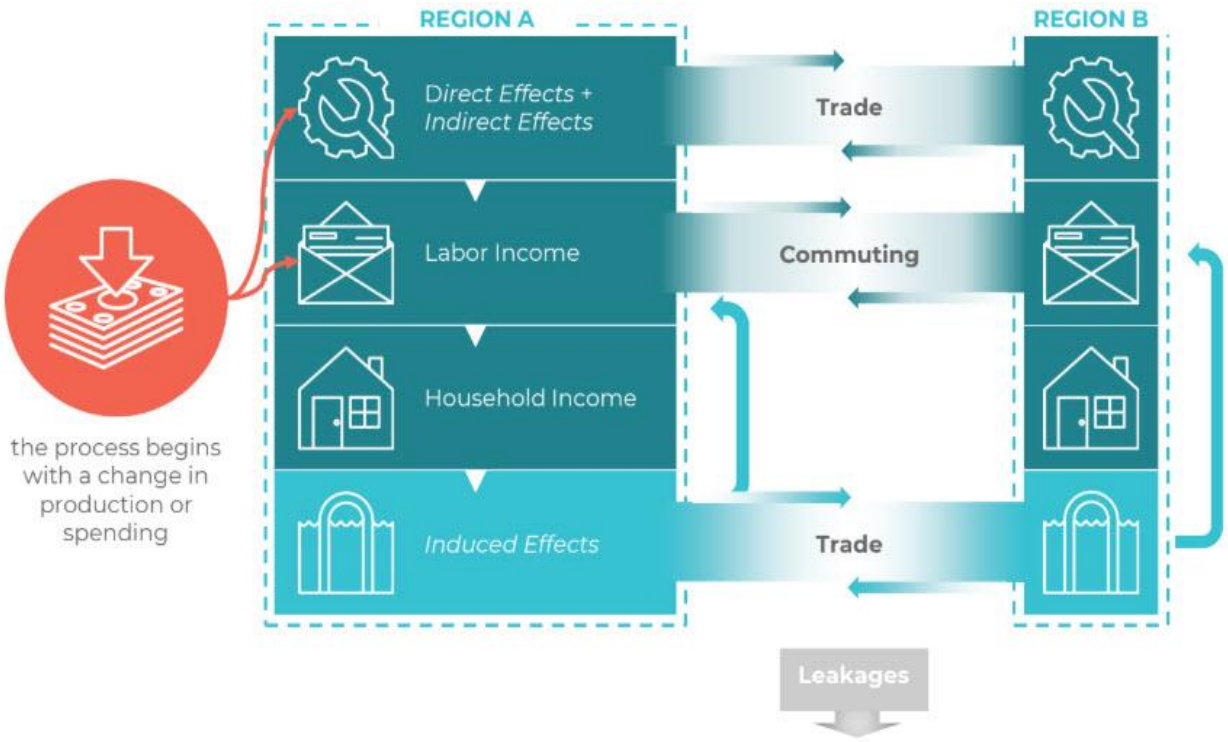
- **Labor income** is the sum of employee compensation (including all payroll and benefits) and proprietor income (income for self-employed work).

- **Employment** represents the annual average number of full and part time employees of sectors producing output.

As noted above, defining the geographic scope of an input output analysis is very important. Historically, analysts would create I-O models based on one county, a group of counties or a state as whole, and the model would aggregate all economic activity within a specified region. For example, a traditional model for the JLUS "region" would use all six county level data files to create the model used to analyze regional level impacts, but since data were aggregated there would be no way (or at least no easy way) to identify how impacts were distributed at the sub-regional or county level.

In the past few years, the IMPLAN Group has developed a robust methodology for estimating inter-regional trade flows referred to as Multi-regional Input Output Analysis (MRIO) that solves the problem of determining how impacts are distributed at a sub-regional level. This module was used in the current study to estimate impacts of each facility for each county in the JLUS region. MRIO analyses use interregional commodity trade and commuting flows to quantify linkages across many regions stemming from a production and or income in another region. This powerful analytical method allows analysts to go beyond a single study region, measuring the economic interdependence of regions. In an MRIO analysis, the direct effect in one region can trigger indirect and induced effects in linked regions, capturing some of what would have been a leakage in a traditional I-O model. Trade and commuting dollars bounce between regions until they funnel through the rest of the economy or are leaked out as imports to other regions or through profits and taxes (Figure 5-1).

Figure 5-1
IMPLAN Multi-regional Input Output Analysis



Source: Courtesy of IMPLAN Inc.

A related consideration is the level of geographic disaggregation or specificity. IMPLAN generates data sets ranging from the U.S. a whole, and sub-regions including individual states, counties, U.S. congressional districts, and zip codes. As was the case with the 2013 analysis, IMPLAN data sets for this study are county level, and thus direct impacts must conform to county level boundaries, which may not be entirely realistic particularly for the El Paso area that forms a Census Metropolitan Statistical Area (MSA) consisting of territory in several counties in both New Mexico and Texas. In other words, like natural resources, the geography of regional economies rarely conforms to political boundaries. Other assumptions for IMPLAN modeling developed for this study include: 1) models were generated based 2018 IMPLAN data (most recently available) and monetary figures are reported in year 2020 dollars, and 2) direct impacts of expenditures for each installation occur entirely in the following counties: Holloman AFB (Otero County), Fort Bliss (El Paso County) and WSMR (Dona Ana County).

5.4 Expenditures and Employment at JLUS Military Installations

Table 5-1 displays expenditures and employment or workforce data. Workforce data for Ft. Bliss and WSMR were provided by the public affairs offices at each respective post, and employment data for Holloman AFB were obtained from congressional budget documents. The 2013 analysis included German Air Force personnel billeting and training at Holloman AFB; however, in Germany terminated its contract to train their pilots at Holloman and no longer operates at the facility.

In addition to reported regional expenditures for general contracting, local purchases, and construction (Table 5-6), model runs include direct output for the federal government sector net of what is reported in Table 5-6, and net of output from other federal agencies in the region such as the U.S. Border Patrol in El Paso and Las Cruces, which employs several thousand people in the region. Given that USACE was not provided current data for expenditures reported in the 2013 analysis for general contracting and local purchases, figures from the 2013 report were inflated to 2018 price levels and assumed to change in proportion to current workforces levels.

Table 5-1
Total Full and Part-time Workforce and Student Population at White Sands Missile Range, New Mexico (2019)

Category	2020
Army Military	230
Other Military (AF -121, Navy- 19)	140
Total Full-Time Military	370
Transient Military (various test/training missions)	614
Total Military	984
Army Civilians	1,637
Contractors	1,458
Other Civilians (NAF, School, AAFES, DECA, IHG, etc.)	1,963
Total Full-Time Civilians	5,058
Transient Civilians (support test/training missions)	28
Total Civilians	5,086
Total Workforce Population	6,070

Source: White Sands Missile Range Office of Public Affairs

Table 5-2
Total Full and Part-time Workforce and Student Population at Fort Bliss, Texas (2019)

Category	Number
Army Military	23,886
PCS Students Military	722
Deployed Military	1,170
Other Military	1,274
Total Full-time Military	27,052
TDY Students and Trainees Military	969
Transient and Rotational Military	4,206
Reserve Component Military	2,333
Total Military	34,560
Army Civilians	3,496
Contractors	3,510
Other Civilians (NAF, School, AAFES, DECA, IHG, etc.)	5,672
Total Full-time Civilians	12,678
TDY Students Civilians	3
Transient and Rotational Civilians	27
Total Civilians	12,708
Total Workforce Population	47,268

Source: Fort Bliss Office of Public Affairs

Table 5-3
Total Full and Part-time Workforce and Student Population at Holloman Air Force Base, New Mexico (2019)

Category	Number
Permanent	
Officer	330
Enlisted	2,741
Civilian	522
Total	3,593
Students	60
Supported	
Officer	96
Enlisted	359
Civilian	226
Total Workforce Population	4,334

Source: Department of the Air Force. Military Construction Program: Fiscal Year (FY) 2019 Budget Estimates, Justification Data Submitted to Congress, February 2019.

Table 5-4
Construction Expenditures at JLUS Military Installations ($millions, 2019)

Facility	Item	Expenditures ($millions)
Holloman AFB	MQ-9 FTU Ops Facility	$85.0
Ft. Bliss	Supply Support Activity	$24.0
WSMR	Information Systems Facility	$40.0
Total	-	$149.0

Source: Department of the Army and Air Force Fiscal Year (FY) 2019 MILCON Budget Estimates, Justification Data Submitted to Congress, February 2019.

Table 5-5
General Contracting and Local Purchases at JLUS Military Installations ($millions, 2019)

Facility	General contracting and purchases	Construction	Other purchases	Total Non-labor expenditures
Holloman AFB	$12.0	$85.0	$53	$150.0
Ft. Bliss	$1,429.6	$24.0	$575	$2,028.4
WSMR	$532.5	$40.0	$74	$646
Total	$1,974.1	$149.0	$701	$2,825

Source: Based on figures generated in 2013 economic impact analysis and IMPLAN data.

Table 5-6
Summary of Reported and Estimated Expenditures and Employment at JLUS Military Installations

Facility	Workforce	Labor income ($millions)[1]	Output in addition to labor expenditures ($millions) [2]
Holloman AFB	4,334	$456	$150.0
Ft. Bliss	47,268	$3,764	$2,028.4
WSMR	6,070	$418	$646
Total	57,672	$4,638	$2,825

1. Labor income in IMPLAN data is the same as total payroll and includes wages, salaries and benefits (basically a loaded labor rates versus take home pay), and thus this figure in higher than those reported as real wages in previous sections. 2. Output in the context of government sectors include all expenditures for operation, maintenance, and construction projects. Source: Based on data in Tables 5-1 through 5-6 of this report and IMPLAN regional data.

5.6 Results

Tables 5-7 through 5-13 are the proverbial punchline of this study and contain the regional economic development benefits of the three facilities in question. Each matrix shows the impact of installations at the county level, and Table 5-13 summarizes regional totals. At the regional level, Ft. Bliss, Holloman AFB and WSMR account for:

- 102,970 full and part time jobs in the region (about 90 percent are full time positions),
- $6.5 billion in labor income per year (average of $63,400 per employee),
- $10.6 billion in gross domestic product,
- $13.6 billion in output; and generates
- $379 million in local and state tax revenues.

Table 5-7
Regional Economic Impacts of JLUS Military Installations in El Paso County, Texas
(Employment rounded to nearest 10th, and monetary figures reported in $millions)

Fort Bliss, Texas					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	47,270	$3,763.9	$5,792.3	$5,792.3	-
Indirect	6,410	$251.1	$382.9	$811.8	-
Induced	24,310	$924.1	$1,695.9	$3,241.0	-
Total	77,990	$4,939.0	$7,871.1	$9,845.1	$278.4
Percent of County Total	18%	25%	24%	16%	11%
Holloman AFB, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	100	$3.5	$5.6	$12.4	-
Induced	130	$10.4	$14.3	$31.2	-
Total	230	$13.8	$19.9	$43.6	$0.73
Percent of County Total	<1%	<1%	<1%	<1%	<1%
White Sands Missile Range, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	170	$8.8	$16.9	$43.9	-
Induced	350	$13.3	$24.4	$46.6	-
Total	520	$22.1	$41.3	$90.5	$1.8
Percent of County Total	<1%	<1%	<1%	<1%	<1%
Total El Paso County					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	47,270	$3,763.9	$5,792.3	$5,792.3	-
Indirect	6,680	$263.3	$405.4	$868.0	-
Induced	24,790	$947.7	$1,734.6	$3,318.8	-
Total	78,740	$4,974.9	$7,932.3	$9,979.2	$281.0
Percent of County Total	19%	25%	25%	17%	11%

Table 5-8
Regional Economic Impacts of JLUS Military Installations in Dona Ana County, New Mexico
(Employment rounded to nearest 10th, and monetary figures reported in $millions)

Fort Bliss, Texas					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	840	$40.6	$59.7	$143.1	-
Induced	2,780	$165.5	$223.8	$483.2	-
Total	3,620	$206.0	$283.6	$626.3	$11.6
Percent of County Total	4%	5%	4%	5%	2%
Holloman AFB, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	160	$9.5	$11.8	$26.8	-
Induced	350	$21.6	$28.0	$62.4	-
Total	510	$31.0	$39.8	$89.1	$1.64
Percent of County Total	1%	1%	1%	1%	<1%
White Sands Missile Range, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	6,070	$417.7	$1,064.0	$1,064.0	-
Indirect	1,570	$63.2	$96.5	$200.1	-
Induced	3,860	$117.1	$215.0	$368.7	-
Total	11,500	$598.0	$1,375.5	$1,632.9	$50.7
Percent of County Total	11%	14%	19%	13%	12%
Total Dona Ana County					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	6,070	$417.7	$1,064.0	$1,064.0	-
Indirect	2,570	$113.3	$168.0	$369.9	-
Induced	6,990	$304.1	$466.8	$914.3	-
Total	15,630	$835.0	$1,698.8	$2,348.3	$60.9
Percent of County Total	15%	19%	24%	19%	14%

Table 5-9
Regional Economic Impacts of JLUS Military Installations in Lincoln County, New Mexico
(Employment rounded to nearest 10th, and monetary figures reported in $millions)

Fort Bliss, Texas					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	190	$12.2	$15.9	$35.9	-
Induced	110	$6.8	$8.6	$19.6	-
Total	300	$19.0	$24.5	$55.6	$1.08
Percent of County Total	3%	6%	4%	4%	1%
Holloman AFB, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	100	$6.0	$7.7	$17.5	-
Induced	250	$13.9	$19.1	$42.3	-
Total	350	$19.9	$26.8	$59.9	$1.14
Percent of County Total	3%	6%	4%	5%	1%
White Sands Missile Range, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	30	$1.6	$2.1	$4.7	-
Induced	80	$4.8	$6.1	$13.9	-
Total	110	$6.4	$8.2	$18.6	$0.35
Percent of County Total	1%	2%	1%	1%	<1%
Total Lincoln County					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	320	$19.8	$25.7	$58.1	-
Induced	440	$25.5	$33.8	$75.9	-
Total	760	$45.3	$59.5	$134.0	$2.6
Percent of County Total	7%	13%	9%	11%	2%

Table 5-10
Regional Economic Impacts of JLUS Military Installations in Otero County, New Mexico
(Employment rounded to nearest 10th, and monetary figures reported in $millions)

Fort Bliss, Texas					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	110	$6.6	$8.6	$19.7	-
Induced	300	$17.4	$23.6	$51.9	-
Total	410	$24.0	$32.2	$71.6	$1.42
Percent of County Total	1%	2%	1%	1%	<1%
Holloman AFB, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	4,340	$507.4	$605.8	$605.8	-
Indirect	240	$7.6	$12.8	$31.1	-
Induced	1,620	$59.7	$122.7	$221.8	-
Total	6,200	$574.7	$741.3	$858.7	$25.8
Percent of County Total	23%	15%	19%	16%	15%
White Sands Missile Range, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	180	$11.6	$14.6	$33.6	-
Induced	450	$28.7	$36.4	$83.0	-
Total	630	$40.3	$51.1	$116.5	$2.11
Percent of County Total	2%	1%	1%	2%	<1%
Total Otero County					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	4,340	$507.4	$605.8	$605.8	-
Indirect	530	$25.8	$36.0	$84.3	-
Induced	2,370	$105.8	$182.7	$356.8	-
Total	7,240	$639.0	$824.5	$1,046.9	$29.3
Percent of County Total	26%	17%	21%	20%	15%

Table 5-11
Regional Economic Impacts of JLUS Military Installations in Sierra County, New Mexico
(Employment rounded to nearest 10th, and monetary figures reported in $millions)

Fort Bliss, Texas					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.9	-
Indirect	10	$0.2	$0.3	$0.6	-
Induced	10	$0.2	$0.3	$1.5	-
Total	20	$0.4	$0.6	$2.9	$0.07
Percent of County Total	<1%	<1%	<1%	1%	<1%
Holloman AFB, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	10	$0.5	$0.7	$1.5	-
Induced	30	$2.0	$2.5	$5.7	-
Total	40	$2.5	$3.1	$7.2	$0.13
Percent of County Total	1%	2%	1%	1%	<1%
White Sands Missile Range, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	40	$2.0	$2.6	$6.2	-
Induced	70	$4.3	$5.4	$12.4	-
Total	110	$6.3	$8.0	$18.6	$0.41
Percent of County Total	2%	4%	3%	3%	<1%
Total Sierra County					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.9	-
Indirect	60	$14.6	$18.4	$42.1	-
Induced	110	$10.4	$13.2	$31.0	-
Total	170	$25.0	$31.5	$74.0	$0.6
Percent of County Total	4%	6%	4%	5%	<1%

Table 5-12
Regional Economic Impacts of JLUS Military Installations in Socorro County, New Mexico
(Employment rounded to nearest 10th, and monetary figures reported in $millions)

Fort Bliss, Texas					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	20	$0.8	$1.0	$2.4	-
Induced	10	$0.0	$0.0	$0.0	-
Total	30	$0.8	$1.1	$2.4	$0.10
Percent of County Total	<1%	<1%	<1%	<1%	<1%
Holloman AFB, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	20	$0.8	$1.0	$2.2	-
Induced	30	$1.5	$1.9	$4.4	-
Total	50	$2.3	$2.9	$6.6	$0.17
Percent of County Total	1%	1%	1%	1%	<1%
White Sands Missile Range, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	220	$13.9	$17.4	$40.0	-
Induced	130	$8.2	$10.4	$23.8	-
Total	350	$22.1	$27.8	$63.8	$1.3
Percent of County Total	4%	7%	6%	8%	1%
Total Socorro County					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	0	$0.0	$0.0	$0.0	-
Indirect	260	$15.5	$19.4	$44.6	-
Induced	170	$9.8	$12.4	$28.2	-
Total	430	$25.3	$31.7	$72.8	$1.6
Percent of County Total	5%	8%	7%	9%	1%

Table 5-13
Regional Economic Impacts of JLUS Military Installations
(Employment rounded to nearest 10th, and monetary figures reported in $millions)

Fort Bliss, Texas					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	47,270	$3,763.9	$5,792.3	$5,793.2	-
Indirect	7,580	$311.5	$468.5	$1,013.5	-
Induced	27,520	$1,114.0	$1,952.1	$3,797.3	-
Total	82,370	$5,189.3	$8,212.9	$10,603.9	$292.7
Percent of Regional Total	14%	18%	18%	12%	9%
Holloman AFB, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	4,340	$507.4	$605.8	$605.8	-
Indirect	630	$27.8	$39.5	$91.5	-
Induced	2,410	$109.1	$188.5	$367.8	-
Total	7,380	$644.3	$833.8	$1,065.1	$29.60
Percent of Regional Total	1%	2%	2%	1%	1%
White Sands Missile Range, New Mexico					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	6,070	$417.7	$1,064.0	$1,064.0	-
Indirect	2,210	$101.1	$150.1	$328.4	-
Induced	4,940	$176.4	$297.8	$548.5	-
Total	13,220	$695.2	$1,511.9	$1,941.0	$56.7
Percent of County Total	2%	2%	3%	2%	2%
JLUS Region					
	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	57,680	$4,688.9	$7,462.1	$7,463.0	-
Indirect	10,420	$440.4	$658.1	$1,433.3	-
Induced	34,870	$1,399.5	$2,438.4	$4,713.6	-
Total	102,970	$6,528.8	$10,558.6	$13,610.0	$379.0
Percent of County Total	17%	23%	23%	16%	11%

5.7 Local Economic Impacts of the Bataan Memorial Death March

At the request of WSMR leadership, USACE estimated the local economic impacts of the annual Bataan Memorial Death March sponsored by WSMR in Dona Ana County each year. Since 1992, WSMR has hosted the event in honor of American and Filipino soldiers of World War II, who were forced by the Imperial Japanese Army to march 65 miles through jungle terrain enduring extremely rough conditions, torture or execution, while others died in prisoner camps after the march. Others were killed while being transported on unmarked ships that were attacked by U.S. forces.

In 2017, there were 7,058 registered participants in the event; and in 2019, there were 8,626 marchers from all 50 U.S. states and a dozen foreign countries along with 1,500 volunteers to assist them. Participants include military members from all branches of the U.S. military, and civilians from across the country and several foreign nations.

Estimating the impacts of a local recreational event is similar to previous analyses in this report; however, it is important to determine how many of the participants come from outside of the local area. The logic is that if participants are local residents, the expenditures are not a net benefit to the local economy because local residents would spend the money elsewhere at some point. In other words, at the local level money is just moving from one place to another. Table 5-14 displays the number of participants by origin, and most come from outside of New Mexico, and based on data provided by WSMR about 93 percent of participants from New Mexico come from outside of Dona Ana County, and only 7 percent are locals.

Table 5-14
Number of Participants in the Bataan Death Memorial Death March

Region	2017	2018	2019
New Mexico	1,595	1,691	1,825
Texas	1,876	2,259	2,377
Other	3,587	4,161	4,424
Total	7,058	8,111	8,626

Source: White Sands Missile Range Office of Public Affairs

Ideally, for these types of analyses, researchers would survey event participants for information on expenditures, where participants lived, length of stay and so on; but under time and budget constraints, secondary data and assumptions are appropriate and provide a good approximation. For this study, authors assumed that:

1) Participants and volunteers total 10,126 people (based on 2019 marathon data).

2) Non-local participant expenditures in the local economy are based on current GSA per diem and lodging rates for New Mexico.

3) Non-local participants purchase lodging for two days and expend 3 days of worth of meals and incidentals (M&I).

4) All expenditures occur in Dona Ana County (i.e., direct impacts are local).

5) To account for the likely possibility that some non-local participants are accompanied by friends or family, first and last day M&I expenditures are not truncated (i.e., adjusted to reflect partial day values).

Based on the above assumptions, at 2019 participation levels, sales revenues to local businesses in Dona Ana County would total $6.4 million, and labor income would amount to $1.7 million. Activity generated would support 55 local jobs for one year, and generate $430,000 in state and local tax revenues within Dona Ana County (Table 5-15). Figures were estimated using the same MRIO model applied throughout this study, but the spillover effects in other counties were negligible.

Table 5-15
Local Economic Impacts of the Annual Bataan Memorial Death March Sponsored by WSMR in Dona Ana County, New Mexico (Monetary figures reported in $millions)

	Employment	Labor Income	Gross Domestic Product	Output	State and Local Taxes
Direct	40	$1.19	$1.77	$4.80	-
Indirect	6	$0.25	$0.39	$0.82	-
Induced	9	$0.25	$0.47	$0.81	-
Total	55	$1.69	$2.62	$6.42	$0.43
Percent of County Total	<1%	<1%	<1%	<1%	<1%

6.0 Conclusion

As noted in the introduction to this report, federal military installations are “export based” regional industries meaning that the money that funds them comes from outside of the region. Unlike like traditional goods producing industries such as agriculture that export most of their products to other economies such as corn formers in Iowa who sell grain to consumers in Europe and Asia, federal military bases export services that benefit the nation as a whole. Taxpayer money comes

into the JLUS region, and each facility trains and equips Soldiers from Fort Bliss, fighter jets from Holloman AFB and ordinance and technology from WSMR that is "exported" from the region to protect national interests and security. Local economic activity generated by these installations supports the JLUS region that in turn provides personnel at each facility with communities that they can call home.

Each installation is a major local and or regional economic engine. Collectively, JLUS federal military installations account for 17 percent of jobs in the region and 23 percent of GDP. At the county level, the impacts are also significant. For example, Ft. Bliss generates about 20 percent of jobs and 25 percent income and GDP in El Paso County. In counties adjacent to counties with military installations, spillover effects in the form commuting and trade also generate a substantial amount of economic activity.

Based on the analysis, one thing is abundantly clear: Fort Bliss, WSMR and Holloman AFB are fundamental components of the JLUS economy, particularly in El Paso, Dona Ana and Otero counties, and any large contraction, expansion or closure of these facilities would have major positive or negative economic implications for the region.