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 (JLUS)

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PREPARED BY BORDER RESEARCH, A NEW MEXICO-BASED FIRM, UNDER CONTRACT TO AECOM TECHNICAL SERVICES, INC., ATLANTA, GA 30309

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1.0 INTRODUCTION

In August 2012, the U.S. Department of Defense's Office of Economic Adjustment (OEA) 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 and White Sands Missile Range (WSMR). The study examines the use of land, air space and other resources for the purpose of establishing a common vision for regional growth while safeguarding the assets of the military installations. Due to the large size of the region (27,173 square miles) and the significance of the installations to the nation's defense, the Southern New Mexico-El Paso (SNM-El Paso) study ranks among the largest and most ambitious JLUS efforts undertaken by OEA.

This report addresses the economic impact task of the SNM-El Paso study. The objective of the report is to describe the socioeconomic conditions of the six-county region, characterize the region's economic performance, and estimate the impacts of Fort Bliss, Holloman and WSMR on local jobs, incomes and industry output.

THE JLUS PARTNERSHIP

To launch the SNM-El Paso JLUS, a Memorandum of Agreement was adopted in September 2012 by the nine government partners:

Cities	**Counties**	
Alamogordo, NM	Doña Ana, NM	Otero, NM
El Paso, TX	El Paso, TX	Sierra, NM
Las Cruces, NM	Lincoln, NM	Socorro, NM

According to the Agreement, the partners consent to contribute to the final cost of the study and promote implementation of the study's final recommendations. To guide the effort, the Agreement establishes a Regional Planning Organization supported by Technical and Policy committees and assigns 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 appointed fiscal agent for the OEA grant.

2.0 REGIONAL DESCRIPTION

The Southern New Mexico-El Paso JLUS region occupies 27,173 square miles (70,378 km^2), an area covering nearly 1.0 % of the entire land mass of the continental United States. 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 Monument. At its higher elevations, the region overlaps with 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. A notable feature is the Rio Grande, the legendary river of the Western U.S., providing the region with one of its few sources of renewable surface water.

The SNM-El Paso JLUS is comprised 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:

Towns	**Villages**	
Anthony, TX	Capitan, NM	Ruidoso, NM
Carrizozo, NM	Cloudcroft, NM	Ruidoso Downs, NM
Clint, TX	Corona, NM	Tularosa, NM
Mesilla, NM	Hatch, NM	Vinton, TX
	Magdalena, NM	Williamsburg, NM

2.1 POPULATION

The U.S. Census Bureau estimates the JLUS six-county population at 1,157,691 with the major urban centers of El Paso and Las Cruces anchoring much of the region's population. Average annual growth is calculated at 1.61% for the past two decades, exceeding the U.S. average of 1.09% for the same years. The effects of the military on the JLUS population can be demonstrated in the city of Alamogordo, which witnessed a marked decline in its population from 2000 to 2010 (See Exhibit 2.2) at the same time Holloman AFB experienced a loss in military personnel during an exchange of aircraft.

Exhibit 2.1 shows the population for incorporated and unincorporated areas in the JLUS region. From 1990 to 2010, the counties of El Paso, Doña Ana, Lincoln and Otero – all within commuting distance to at least one of the region's military installations – reported average annual population growth that exceeded or mirrored the national average. Sierra and Socorro counties – located at greater distances from the military centers of employment – grew at slower rates.

EXHIBIT 2.1 POPULATION TRENDS IN INCORPORATED & UNINCORPORATED AREAS, 1990-2012

Community	1990	2000	2010	Population Estimates (as of July 1)		Estimated Change (1990-2012)	% Avg. Annual Growth	
				2010	2012		1990-2010	2010-2012
U.S. (000's)	**248,709**	**281,421**	**308,745**	**309,326**	**313,914**	**65,205**	**1.09**	**0.74**
New Mexico	**1,515,069**	**1,819,046**	**2,059,179**	**2,064,767**	**2,085,538**	**570,469**	**1.55**	**0.50**
Texas	**16,986,510**	**20,851,820**	**25,145,561**	**25,242,683**	**26,059,203**	**9,072,693**	**1.98**	**1.60**
Doña Ana County	**135,510**	**174,682**	**209,233**	**210,325**	**214,445**	**78,935**	**2.20**	**0.97**
Anthony[1]				9,537	9,542			0.03
Hatch	1,318	1,673	1,648	1,630	1,639	321	1.12	0.28
Las Cruces	62,648	74,267	97,618	98,230	101,047	38,399	2.24	1.42
Mesilla	1,976	2,180	2,196	1,899	1,913	-63	0.53	0.37
Sunland Park	8,357	13,309	14,106	14,298	14,776	6,419	2.65	1.66
Balance of County	61,211	83,253	93,665	84,731	85,528	24,317	2.15	0.47
Lincoln County	**12,219**	**19,411**	**20,497**	**20,473**	**20,309**	**8,090**	**2.62**	**-0.40**
Capitan	840	1,443	1,489	1,486	1,470	630	2.90	-0.54
Carrizozo	1,075	1,036	996	994	984	-91	-0.38	-0.50
Corona	215	165	172	172	170	-45	-1.11	-0.58
Ruidoso (village)	4,636	7,698	8,029	8,028	8,005	3,369	2.78	-0.14
Ruidoso Downs	917	1,824	2,815	2,787	2,739	1,822	5.77	-0.86
Balance of County	4,536	7,245	6,996	7,006	6,941	2,405	2.19	-0.46
Otero County	**51,928**	**62,298**	**63,797**	**64,319**	**66,041**	**14,113**	**1.03**	**1.33**
Alamogordo	27,986	35,582	30,403	30,655	31,500	3,514	0.42	1.37
Cloudcroft	612	749	674	679	697	85	0.48	1.32
Tularosa	2,753	2,864	2,842	2,866	2,943	190	0.16	1.33
Balance of County	20,577	23,103	29,878	30,119	30,901	10,324	1.88	1.29
Sierra County	**9,912**	**13,270**	**11,988**	**12,018**	**11,895**	**1,983**	**0.96**	**-0.51**
Elephant Butte[2]		1,390	1,431	1,434	1,424	1,424		-0.35
Truth or Consequences	6,224	7,289	6,475	6,491	6,411	187	0.20	-0.62
Williamsburg	463	527	449	451	447	-16	-0.15	-0.44
Balance of County	3,225	4,064	3,633	3,646	3,613	388	0.60	-0.45
Socorro County	**14,764**	**18,078**	**17,866**	**17,846**	**17,603**	**2,839**	**0.96**	**-0.68**
Magdalena	844	913	938	938	926	82	0.53	-0.64
Socorro	8,207	8,877	9,051	9,042	8,906	699	0.49	-0.75
Balance of County	5,713	8,288	7,877	7,866	7,771	2,058	1.62	-0.61
NM JLUS Region	**224,333**	**287,739**	**323,381**	**324,981**	**330,293**	**105,960**	**1.85**	**0.81**
El Paso County	**591,610**	**679,622**	**800,647**	**803,506**	**827,398**	**235,788**	**1.52**	**1.48**
Anthony	3,326	3,850	5,011	5,027	5,157	1,831	2.07	1.28
Clint	1,033	980	926	927	924	-109	-0.55	-0.16
El Paso	515,652	563,662	649,152	651,562	672,538	156,886	1.16	1.60
Horizon City	2,308	5,233	16,730	16,917	18,769	16,461	10.41	5.33
San Elizario[3]	4,205	11,046	13,603			-4,205	6.05	
Socorro	23,043	27,152	32,013	32,106	32,693	9,650	1.66	0.91
Vinton	597	1,892	1,971	1,977	1,995	1,398	6.15	0.45
Balance of County	41,446	65,807	88,621	94,990	95,322	53,876	3.87	0.17
Texas JLUS Region	**591,610**	**679,622**	**800,647**	**803,506**	**827,398**	**235,788**	**1.52**	**1.48**
JLUS REGION TOTALS	**815,943**	**967,361**	**1,124,028**	**1,128,487**	**1,157,691**	**341,748**	**1.61**	**1.29**

Source: 1990-2010 Population Counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov/
2010 and 2012 July 1 estimates, Population Estimates Program, U.S. Census Bureau. Found at www.census.gov/
2010 and 2012 Sub-County Population Estimates, Bureau of Business and Economic Research, University of New Mexico and Estimates Program, U.S. Census Bureau. Found at bber.unm.edu and www.census.gov/

[1] Anthony, NM, was incorporated July 2010.
[2] Elephant Butte was incorporated July 1998.
[3] No estimates were provided for 2010 and 2012.

EXHIBIT 2.2 POPULATION TRENDS IN OTERO COUNTY AND ALAMOGORDO, 1990-2010

	1990	2000	2010	% Change	
				1990-2000	2000-2010
Otero County	51,928	62,298	63,797	19.97	2.41
Alamogordo (city)	27,986	35,582	30,403	27.14	-14.56

Source: 1990-2010 Population Counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov/
2010 and 2012 July 1 estimates, Population Estimates Program, U.S. Census Bureau. Found at www.census.gov/

Population estimates for the unincorporated community of Chaparral, NM, which straddles the New Mexico counties of Doña Ana and Otero, are pulled from the county data and reflected in Exhibit 2.3. By most accounts, the community's rapid 8.3% average annual growth reflects an historic under-counting of residents in this mostly Spanish-speaking community.

EXHIBIT 2.3 POPULATION TRENDS FOR UNINCORPORATED COMMUNITY OF CHAPARRAL, 1990-2010

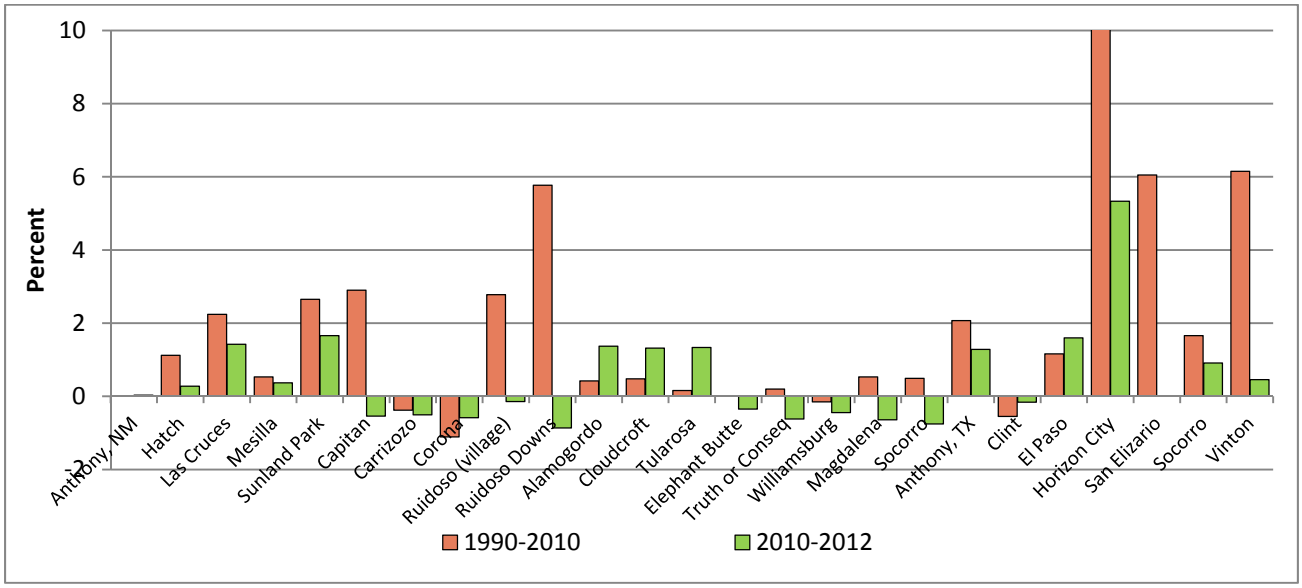
Community	1990	2000	2010	Population Estimates (as of July 1)	Estimated Change (1990-2012)	Change in Population (1990-2010)	% Avg. Annual Growth	
				2010	2012		1990-2010	2010-2012
Chaparral, NM	2,962	6,117	14,631	No data provided	No data provided	11,669	8.3	-

Source: 1990-2010 Population Counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov/

The Census Bureau estimates an overall decline in the rate of population growth for the JLUS region, a trend that tracks a slowdown in growth nationwide. Exhibit 2.4 charts average annual population growth for individual JLUS communities from 1990 through 2010 and separately for years 2010 through 2012. The data are notable in identifying exceptions to the downward trend for the communities of Alamogordo, Cloudcroft, El Paso, and Tularosa, all of which show increases in their respective growth rates. For the cities of Alamogordo and El Paso in particular, a measure of growth may be attributed to increases in personnel at nearby military bases.

Exhibit 2.5 compares average annual growth for the United States, New Mexico, Texas and the JLUS region. The state of Texas leads the group with average annual population growth estimated at 1.6%. New Mexico, experiencing some difficulty recovering from the 2007-2009 housing crisis, trails the group with estimated growth at 0.5%.

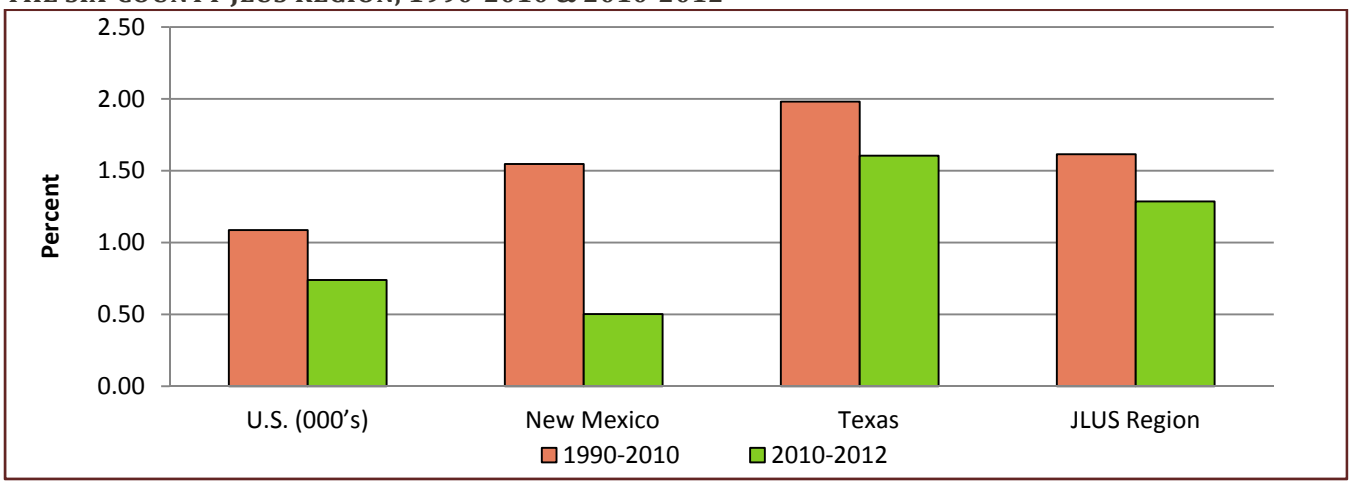
EXHIBIT 2.4 AVERAGE ANNUAL POPULATION GROWTH IN INCORPORATED AREAS, 1990-2010 & 2010-2012



Source: *Sub-County Population Estimates, U.S. Census Bureau and the Bureau of Business and Economic Research, University of New Mexico. Found at www.census.gov/ and bber.unm.edu/. Author's calculations.*

Note: *Anthony, NM, was incorporated in July 2010; Elephant Butte was incorporated in July 1988; complete Census estimates remain unavailable for San Elizario.*

EXHIBIT 2.5 AVERAGE ANNUAL POPULATION GROWTH FOR THE U.S., NEW MEXICO, TEXAS AND THE SIX-COUNTY JLUS REGION, 1990-2010 & 2010-2012



Source: *1990-2010 population counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov/*
2010-2012 figures from Population Estimates Program, U.S. Census Bureau. Found at www.census.gov/
Author's calculations.

2.2 HOUSEHOLDS

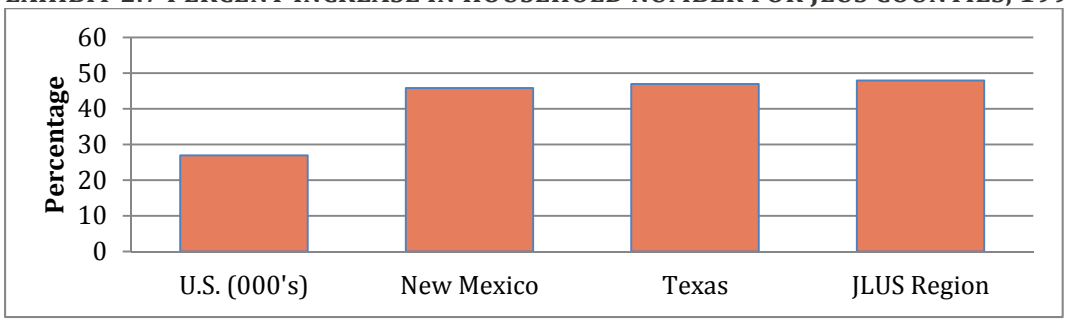
Exhibit 2.6 compares the number of households and the average number of persons per household for the U.S., the states of New Mexico and Texas, and the six JLUS counties for decennial years 1990, 2000 and 2010. During the 20-year period, the number of households in the JLUS region increased by 47.9%, while the average number of persons per household fell from 3.20 to 2.98 (-6.9%). Of note, the state of Texas reported an increase in average household size from 2.73 in 1990 to 2.75 in 2010, defying most state and national trends.

EXHIBIT 2.6 NUMBER OF HOUSEHOLDS AND AVERAGE PERSONS PER HOUSEHOLD, 1990-2010

	1990		2000		2010		% Increase in No. Households (1990-2010)
	Households	Average Persons	Households	Average Persons	Households	Average Persons	
U.S. (000's)	91,947	2.63	105,480	2.59	116,716	2.58	**26.9**
New Mexico	542,709	2.74	677,971	2.63	791,395	2.55	**45.8**
Texas	6,070,937	2.73	7,393,354	2.74	8,922,933	2.75	**47.0**
Doña Ana	45,029	2.92	59,556	2.85	75,532	2.71	**67.7**
Lincoln	4,789	2.48	8,202	2.34	9,219	2.21	**92.5**
Otero	18,155	2.77	22,984	2.66	24,464	2.51	**34.8**
Sierra	4,428	2.72	6,113	2.13	5,917	1.98	**33.6**
Socorro	5,217	3.31	6,675	2.62	7,014	2.46	**34.4**
El Paso	178,366	3.25	210,022	3.18	256,557	3.06	**43.8**
JLUS Region	255,984	3.20	313,552	3.13	378,703	2.98	**47.9**

Source: 1990-2010 population counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov/

EXHIBIT 2.7 PERCENT INCREASE IN HOUSEHOLD NUMBER FOR JLUS COUNTIES, 1990-201

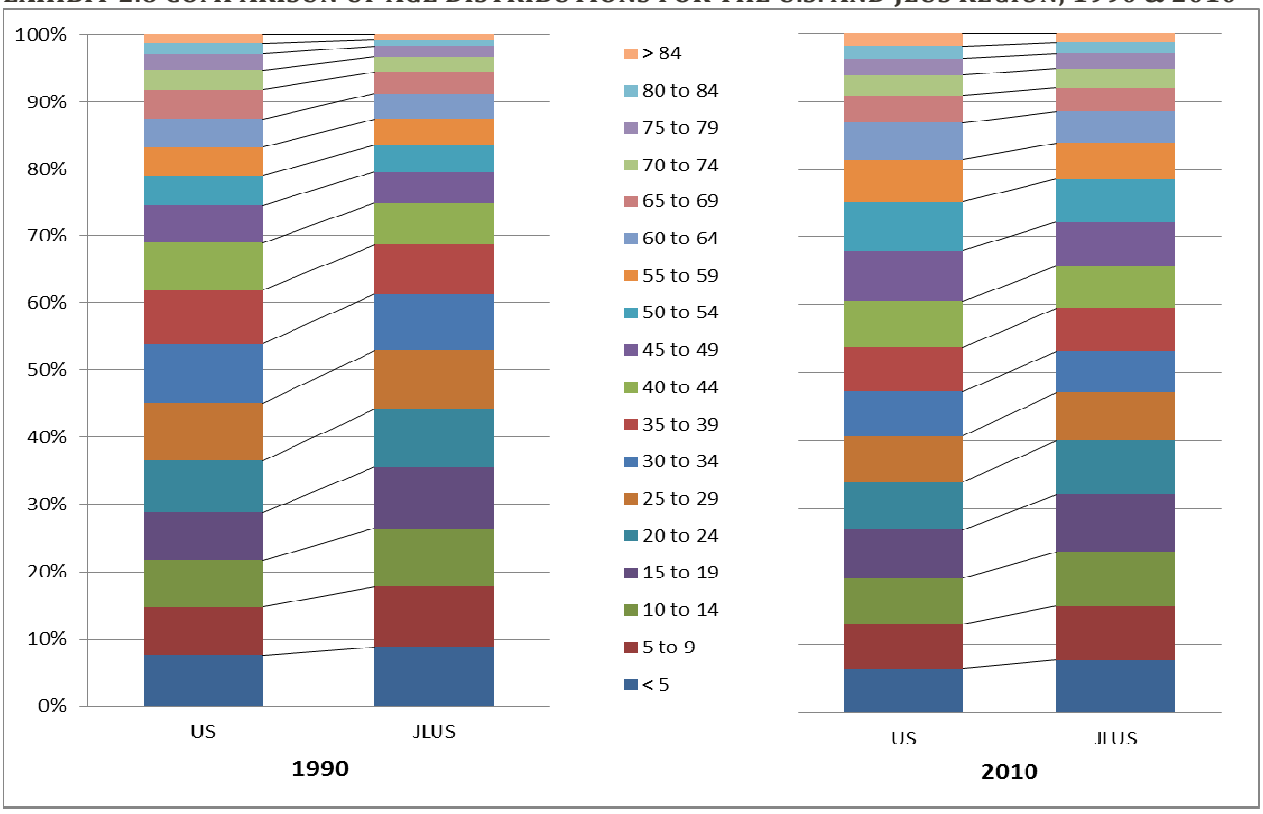


Source: 1990-2010 population counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov/

2.3 AGE

Population data reflect a well-documented trend toward an aging population in the U.S. and for the JLUS region as a whole. Exhibit 2.8 compares population by age ranges for the U.S. and JLUS region based on the 1990 to 2010 census counts. The comparison highlights a segment of the population-- those under the age of 25--who comprise a significantly larger percent of the JLUS population than in the United States overall. A comparison of median age for the U.S. and JLUS region is provided in Exhibit 2.9 and appears to confirm this observation.

EXHIBIT 2.8 COMPARISON OF AGE DISTRIBUTIONS FOR THE U.S. AND JLUS REGION, 1990 & 2010



Source: 1990-2010 population counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov/

EXHIBIT 2.9 MEDIAN AGE FOR THE U.S. AND JLUS REGION, 1990-2010

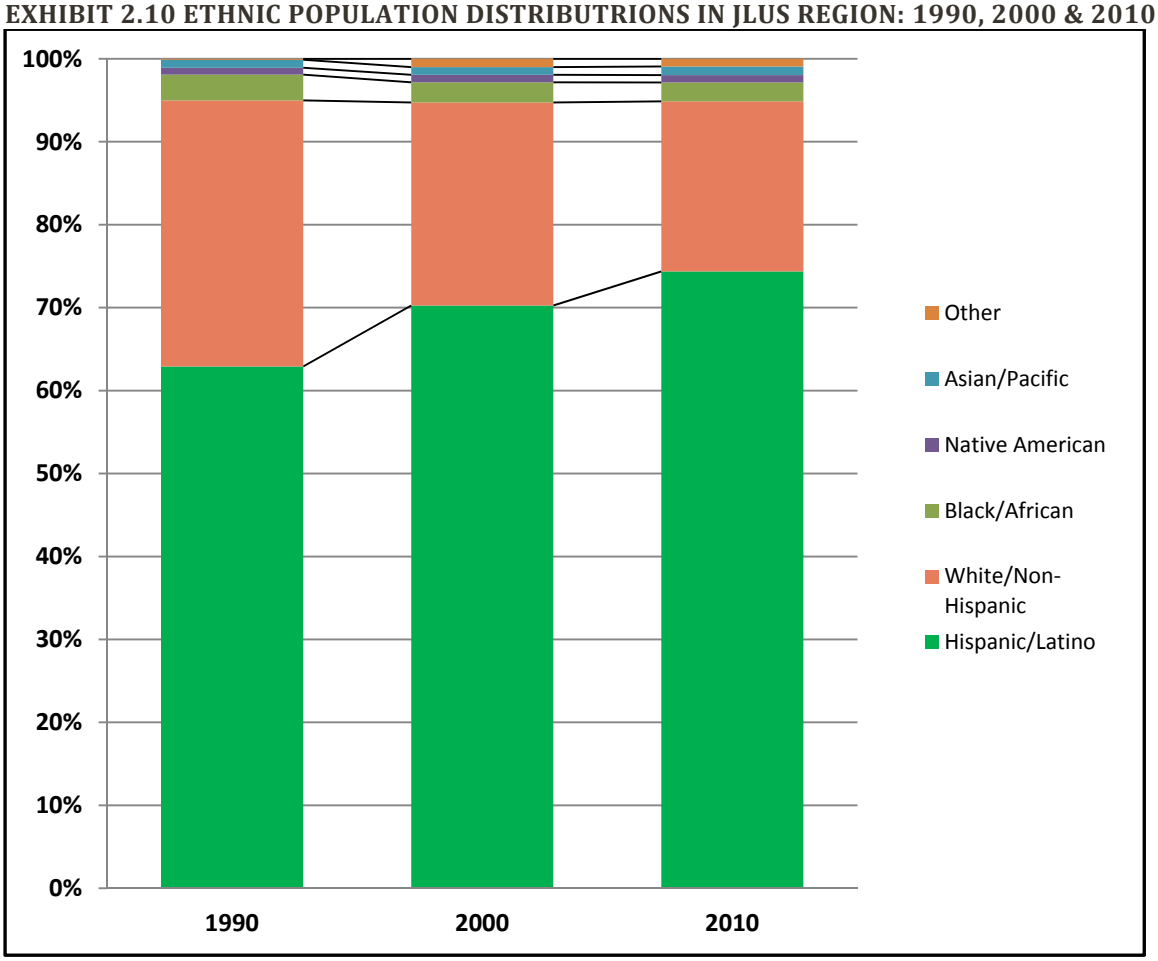
	1990	2000	2010
U.S.	32.9	35.3	37.2
JLUS Region	25.2	27.3	32.3

Source: 1990-2010 population counts by Decennial Census, U.S. Census Bureau. Found at www.census.gov/

2.4 ETHNICITY

From 1990 to 2010, the region's Hispanic and Latino population grew from 63.8 to 74.4% of the total, while the non-Hispanic white population recorded a corresponding decline from 34.1 to 20.2% of the total. This shift mirrors a similar trend across the U.S. southwest and tracks a reported increase in growth overall of the nation's Hispanic and Latino numbers. Exhibit 2.10 compares ethnicity of the JLUS population as reported to the Census Bureau for 1990, 2000, and 2010 and identifies a significant shift in the region's ethnic makeup during those years.

EXHIBIT 2.10 ETHNIC POPULATION DISTRIBUTRIONS IN JLUS REGION: 1990, 2000 & 2010



Source: American Community Survey One-Year Summary Files, U.S. Census Bureau. Found at http://www.census.gov/acs/www/

2.5 EDUCATIONAL ATTAINMENT

As a group, the JLUS counties report 16.2% of their combined populations as having less than a 9th grade education, compared to merely 6.0% for the nation. The JLUS counties also report lower levels of education attainment at the high school, undergraduate and graduate school levels than the nation. However, in the category of "some college, no degree," the JLUS reports education attainment of 22.0%, slightly higher than the nation's 21.2%. These estimates provide important indicators of the human capacity of the JLUS region and demonstrate a potential for improved economic activity from targeted training programs such as vocational and apprenticeship programs. With 16.2% of the JLUS population reporting less than a 9th grade education, the numbers also suggest an excessive school dropout rate.

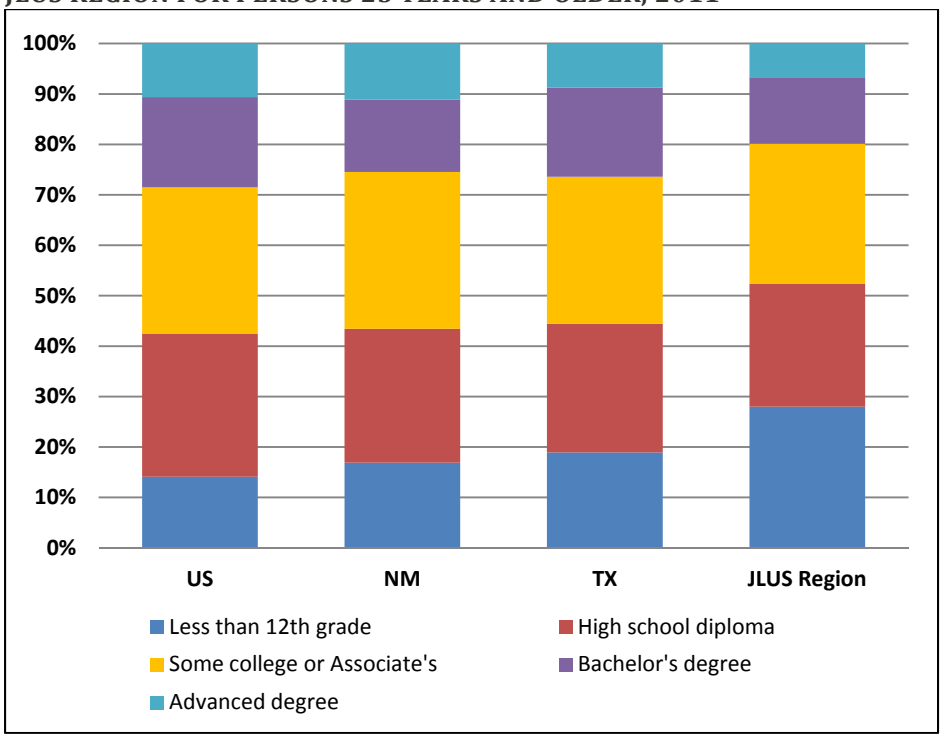
Exhibit 2.11 compares the Census Bureau's estimates of education attainment for individuals in the United States, New Mexico, Texas and the six counties of the JLUS region. Exhibit 2.12 shows these trends as a stacked bar graph.

EXHIBIT 2.11 PERCENT EDUCATIONAL ATTAINMENT FOR JLUS COUNTIES FOR PERSONS 25 YEARS AND OLDER, 2011

	U.S.	NM	TX	County						JLUS Region
				Doña Ana	*Lincoln*	*Otero*	*Sierra*	*Socorro*	*El Paso*	
Less than 9th grade	6.0	7.3	9.5	14.5	4.9	7.6	7.2	11.8	17.5	16.2
9th to 12th grade, no diploma	8.1	9.6	9.4	9.3	8.6	8.2	8.1	10.4	10.5	10.1
High school graduate or equivalency	28.4	26.6	25.5	22.3	25.8	28.3	35.5	32.9	24.3	24.1
Some college, no degree	21.2	23.6	22.6	22.1	27.5	28.4	24.2	19.2	21.5	22.0
Associate's degree	7.8	7.5	6.5	6.5	8.3	10.0	6.1	4.7	6.3	6.6
Bachelor's degree	17.9	14.4	17.7	15.3	15.5	10.9	14.5	11.3	13.2	13.5
Graduate or professional degree	10.6	11.1	8.7	10.1	9.4	6.6	4.3	9.8	6.6	7.4

Source: American Community Survey Five-Year Summary File (2007-2011), U.S. Census Bureau. Found at www.census.gov/
Author's calculations.

EXHIBIT 2.12 COMPARISON OF EDUCATIONAL ATTAINMENT FOR U.S., NEW MEXICO, TEXAS AND JLUS REGION FOR PERSONS 25 YEARS AND OLDER, 2011



Source: U.S. Census Bureau, American Community Survey, Five-Year Summary File, 2007-2011. Found at www.census.gov/
Author's calculations.

2.6 EMPLOYMENT

From 2003 through 2012 total full- and part-time employment in the six-county JLUS region grew by 10.0% for an average annual growth rate of 1.06%. The figures exceed New Mexico's increase of 5.3% employment and the nation's 3.1% increase but underperform Texas' statewide growth of 16.5% for the same years. Among JLUS counties, Sierra County, bordering

WSMR, reports an increase in employment of 16.2% (444 jobs) since 2003. The increase can be attributed, at least in part, to spending associated with the commercial Spaceport America facility outside of Truth or Consequences and construction spending at the north end of WSMR.

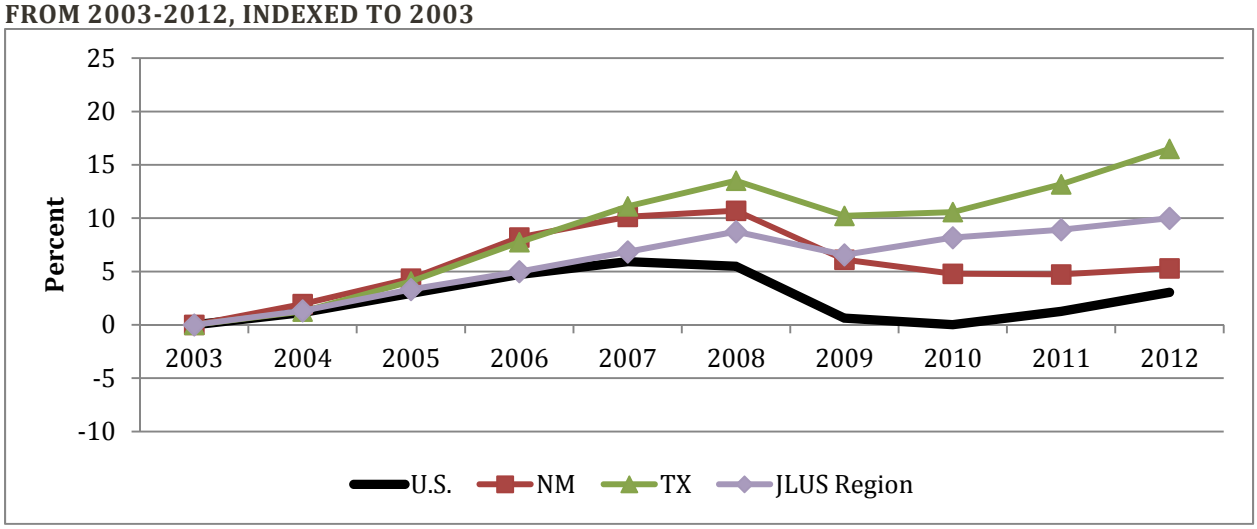
Exhibit 2.13 tracks total employment for the U.S., New Mexico, Texas and the JLUS counties from 2003 through 2012, as reported by the U.S. Labor Department. Exhibit 2.14 highlights the percent employment growth for the U.S., New Mexico, Texas and the JLUS region, indexed to 2003. For these data, the Labor Department excludes active duty military employment.

EXHIBIT 2.13 TOTAL EMPLOYMENT FOR THE U.S., NEW MEXICO, TEXAS AND JLUS COUNTIES, 2003-2012

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	% Avg. Annual Growth
U.S. (000's)	127,796	129,278	131,572	133,834	135,366	134,806	128,608	127,820	129,411	131,696	0.33
New Mexico	745,935	760,449	778,233	807,063	821,484	825,736	791,509	781,694	781,226	785,455	0.58
Texas	9,208,473	9,323,537	9,583,457	9,922,313	10,231,906	10,452,907	10,149,694	10,182,150	10,422,295	10,727,642	1.71
Doña Ana	61,405	62,552	65,191	66,860	67,818	69,105	67,759	69,187	69,109	69,246	1.34
El Paso	251,048	253,095	257,018	261,534	266,400	271,382	266,247	270,603	273,698	276,590	1.08
Lincoln	6,766	7,002	6,816	6,703	7,064	7,162	6,800	6,711	6,514	6,409	- 0.60
Otero	17,167	18,077	18,208	17,816	17,854	17,611	17,135	17,073	16,955	17,616	0.29
Sierra	2,746	2,803	2,891	2,962	3,031	3,287	3,247	3,285	3,183	3,190	1.68
Socorro	4,998	5,134	5,420	5,435	5,512	5,635	5,527	5,403	5,355	5,469	1.01
JLUS Region	344,130	348,663	355,544	361,310	367,679	374,182	366,715	372,262	374,814	378,520	1.06

Source: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Wages Online Annual Averages. Found at www.bls.gov/

EXHIBIT 2.14 EMPLOYMENT GROWTH FOR THE U.S., NEW MEXICO, TEXAS AND JLUS REGION FROM 2003-2012, INDEXED TO 2003



Source: U.S. Department of Labor, Bureau of Labor Statistics, Employment and Wages Online Annual Averages. Found at www.bls.gov/
Author's calculations.

2.7 LABOR FORCE AND UNEMPLOYMENT

The U.S. Labor Department tracks local workforce and unemployment data across the United States. According to the department, average annual unemployment in the JLUS counties began rising in 2008, peaking in 2011 at 9.4%. Data for 2014 show unemployment on the decline throughout the region.

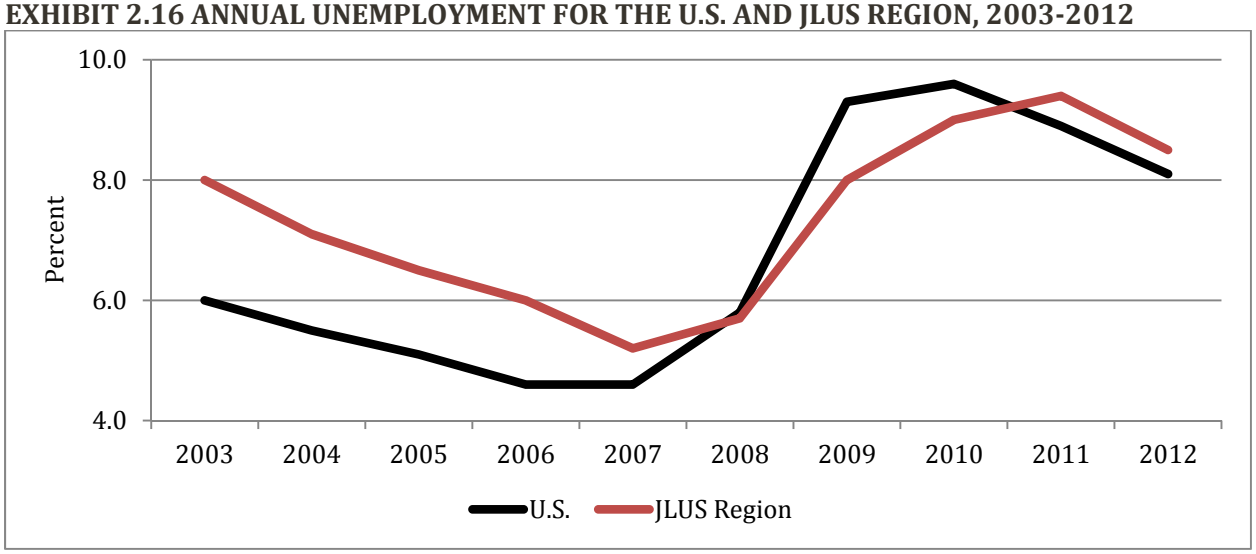
Exhibit 2.15 provides total workforce and unemployment figures for the U.S., each JLUS county and the JLUS region as a whole. Among the counties, El Paso represents about 70% of the regional workforce, but also reports the highest percent unemployment, typically exceeding the U.S. average. Exhibit 2.16 shows regional unemployment tracking closely with U.S. trends.

EXHIBIT 2.15 LABOR FORCE AND ANNUAL UNEMPLOYMENT FOR THE U.S. AND JLUS COUNTIES, 2003-2012

	2003		2004		2005		2006		2007		2008		2009		2010		2011		2012	
	Labor	**%**	**Labor**	**%**	**Labor**	**%**	**Labor**	**%**	**Labor**	**%**	**Labor**	**%**	**Labor**	**%**	**Labor**	**%**	**Labor**	**%**	**Labor**	**%**
U.S.		6.0		5.5		5.1		4.6		4.6		5.8		9.3		9.6		8.9		8.1
Doña Ana	81,818	6.5	82,566	6.4	84,661	5.7	85,466	4.6	87,137	3.9	89,161	4.8	89,985	6.6	91,897	7.7	92,349	7.6	93,195	7.1
El Paso	289,844	8.8	290,177	7.6	290,674	7.0	290,712	6.7	290,672	5.9	297,451	6.3	309,041	8.8	322,460	9.8	326,126	10.4	324,613	9.3
Lincoln	10,849	4.3	11,045	4.4	10,753	4.5	10,466	3.8	10,918	2.9	11,081	3.6	10,878	5.3	10,788	6.3	10,504	5.7	10,385	5.5
Otero	25,438	6.1	26,656	5.3	26,676	5.0	25,944	4.1	26,059	3.5	25,968	4.4	25,894	6.1	25,924	6.8	25,723	6.6	26,198	6.1
Sierra	5,329	5.6	5,362	5.9	5,424	5.4	5,397	4.4	5,560	3.3	5,910	4.1	5,958	5.2	5,930	6.2	5,915	6.4	5,911	6.2
Socorro	8,747	5.1	8,927	5.0	9,310	4.5	9,251	3.6	9,378	3.0	9,541	3.6	9,465	4.8	9,331	5.6	9,200	5.6	9,345	4.9
JLUS Region	**422,025**	**8.0**	**424,733**	**7.1**	**427,498**	**6.5**	**427,236**	**6.0**	**429,724**	**5.2**	**439,112**	**5.7**	**451,221**	**8.0**	**466,330**	**9.0**	**469,817**	**9.4**	**469,647**	**8.5**

Source: U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Annualized. Found at www.bls.gov/

EXHIBIT 2.16 ANNUAL UNEMPLOYMENT FOR THE U.S. AND JLUS REGION, 2003-2012



Source: U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Annualized. Found at www.bls.gov/

2.8 EMPLOYMENT BY INDUSTRY

Employment within the JLUS region demonstrates a heavy reliance on government spending, accounting for one in every four jobs. Within the private sector, retail trade contributes significantly to employment, particularly in El Paso County where 35,768 jobs (12.9% of the county total) are identified with the sector. Recent changes that allow Mexican shoppers greater entry into the border region of New Mexico hold promise that this sector will continue to grow. As is the case throughout the region, public spending on health care and social assistance contributes to the employment base.

Exhibit 2.17 shows county employment by industry sector for years 2003 and 2012. The exhibit highlights employment patterns within each county. Among JLUS counties, El Paso is notable for growth in real estate-related employment (19.1%), a trend that defies the nation and much of the remaining JLUS region. Doña Ana County, a regional center for medical services, reports a large increase (49.5%) in employment in healthcare and social assistance. Lincoln County, a destination for tourism and outdoor recreation, demonstrates growth (27.7%) in accommodation and food service jobs. The counties of Otero, Sierra and Socorro report sharp spikes in certain sectors that include manufacturing (Sierra), arts and entertainment (Otero), and transportation and warehousing (Socorro).

The region's top 10 industry sectors by employment are listed in Exhibit 2.18. Overall, private sector employment in retail, healthcare, manufacturing, and accommodation and food service dominate employment with a notable downturn in El Paso in the formerly dominant manufacturing sector. Exhibit 2.19 charts regional employment by industry indexed to U.S. averages. The chart highlights the region's heavy reliance on government jobs and maps the region's remarkable increase in retail employment from 2003 to 2012.

EXHIBIT 2.17 CIVILIAN EMPLOYMENT BY INDUSTRY SECTOR FOR JLUS COUNTIES, 2003 AND 2012

Sector	Doña Ana			El Paso			Lincoln			Otero			Sierra			Socorro		
	2003	2012	% Change	2003	2012	% Change	2003	2012	% Change	2003	2012	% Change	2003	2012	% Change	2003	2012	% Change
Agriculture, forestry, fishing & hunting	ND	3,385	-	981	998	1.7	76	62	-18.4	88	112	27.3	ND	ND	-	ND	ND	-
Mining, oil and gas	ND	24	-	330	112	-66.1	0	11	100.0	26	54	107.7	ND	ND	-	ND	ND	-
Utilities	268	394	47.0	1,157	1,118	-3.4	48	70	45.8	65	116	78.5	ND	26	-	ND	ND	-
Construction	3,661	3,405	-7.0	11,585	12,718	9.8	709	287	-59.5	883	986	11.7	155	172	11.0	178	80	-55.1
Manufacturing	3,123	2,864	-8.3	26,438	17,868	-32.4	128	65	-49.2	207	184	-11.1	32	83	159.4	141	108	-23.4
Wholesale trade	1,050	1,072	2.1	9,679	9,774	1.0	62	49	-21.0	166	196	18.1	ND	9	-	ND	ND	-
Retail trade	6,640	7,466	12.4	33,252	35,768	7.6	1,180	1,157	-1.9	2,137	2,178	1.9	344	429	24.7	423	455	7.6
Transportation & warehousing	1,150	1,490	29.6	10,444	11,227	7.5	97	85	-12.4	466	276	-40.8	18	10	-44.4	60	118	96.7
Information	1,136	894	-21.3	8,887	4,896	-44.9	81	78	-3.7	236	251	6.4	25	22	-12.0	41	18	-56.1
Finance & insurance	1,471	1,655	12.5	7,693	7,687	-0.1	174	162	-6.9	464	404	-12.9	71	64	-9.9	99	148	49.5
Real Estate, Rental & Leasing	730	683	-6.4	3,762	4,479	19.1	132	138	4.5	165	126	-23.6	29	17	-41.4	28	36	28.6
Professional, scientific	2,723	3,434	26.1	5,709	8,273	44.9	ND	228	-	574	ND	-	60	45	-25.0	479	346	-27.8
Management & enterprises	52	51	-1.9	797	619	-22.3	ND	ND	-	44	ND	-	0	ND	14.3	ND	ND	-
Administrative support & waste management	2,405	3,057	27.1	15,221	20,445	34.3	185	ND	-	1,334	1,074	-19.5	21	18	-14.3	ND	ND	-
Educational services	250	507	102.8	1,332	2,310	73.4	ND	20	-	60	20	-66.7	ND	ND	-	ND	ND	-
Healthcare & social assistance	8,159	12,198	49.5	25,584	34,558	35.1	ND	628	-	1,762	2,335	32.5	ND	ND	-	ND	ND	-
Arts, entertainment & recreation	1,022	1,049	2.6	1,938	1,700	-12.3	583	529	-9.3	28	77	175.0	43	44	2.3	ND	ND	-
Accommodation & food services	5,215	6,269	20.2	21,553	28,483	32.2	977	1,248	27.7	1,334	1,724	29.2	362	380	5.0	ND	ND	-
Other services	1,216	1,313	8.0	6,642	6,663	0.3	148	169	14.2	395	456	15.4	82	72	-12.2	37	39	5.4
Unclassified	24	0	-100.0	266	35	-86.8	0	0	0.0	5	1	-80.0	1	1	0.0	1	3	200.0
Federal	3,525	3,870	9.8	8,803	13,013	47.8	118	111	-5.9	1,925	1,911	-0.7	121	122	0.8	242	209	-13.6
State	5,870	5,586	-4.8	7,817	9,255	18.4	232	234	0.9	771	692	-10.2	305	267	-12.5	1,045	1,091	4.4
Local	7,440	8,581	15.3	41,180	44,593	8.3	940	862	-8.3	4,034	3,471	-14.0	473	498	5.3	1,009	1,049	4.0
TOTAL	57,130	69,247	21.2	251,050	276,592	10.2	5,870	6,193	5.5	17,169	16,644	- 3.1	2,142	2,279	6.4	3,783	3,700	-2.2

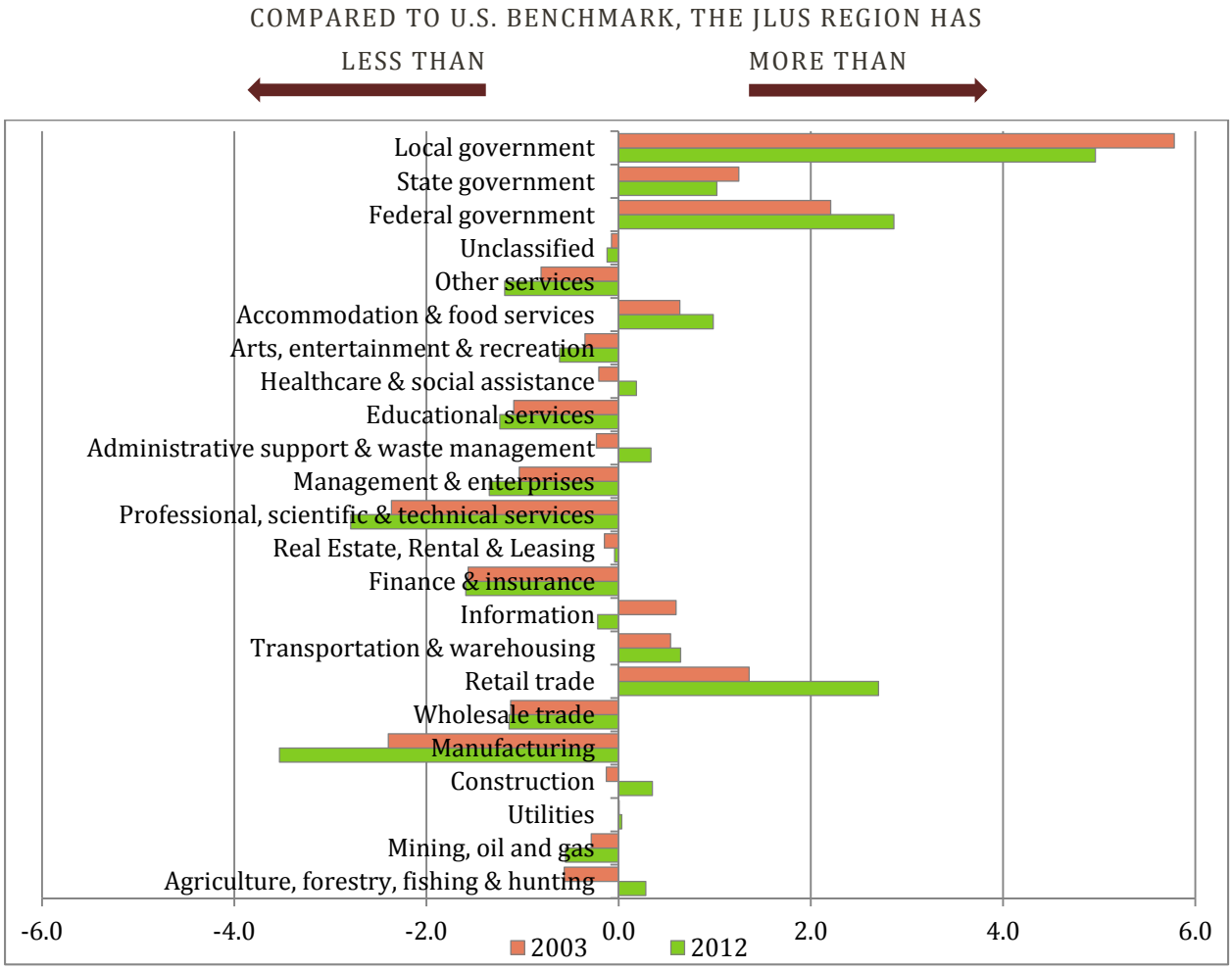
Source: U.S. Bureau of Labor, Bureau of Labor Statistics. Found at www.bls.gov/

EXHIBIT 2.18 TOP 10 INDUSTRIES BY EMPLOYMENT IN JLUS REGION, 2003 AND 2012

Industry Ranking (high to low)	2003		2012		% Change
	Jobs	% of Total	Jobs	% of Total	
Local government	55,076	16.33	59,054	15.37	7.2
Retail trade	43,976	13.04	53,762	13.99	22.3
Healthcare & social assistance	35,505	10.53	49,719	12.94	40.0
Manufacturing	30,069	8.92	21,172	5.51	-29.6
Accommodation & food services	29,441	8.73	38,104	9.92	29.4
Administrative & waste management	19,166	5.68	24,594	6.40	28.3
Construction	17,171	5.09	17,648	4.59	2.8
State government	16,040	4.76	17,125	4.46	6.8
Federal government	14,734	4.37	19,236	5.01	30.6
Transportation & warehousing	12,235	3.63	14,611	3.80	19.4

Source: U.S. Department of Labor, Bureau of Labor Statistics. Found at www.bls.gov/

EXHIBIT 2.19 JLUS EMPLOYMENT BY INDUSTRY INDEXED TO U.S. NORM, 2003 AND 2012



Source: U.S. Bureau of Labor, Bureau of Labor Statistics. Found at www.bls.gov/

3.0 ECONOMIC PERFORMANCE

This section analyzes the economic performance of the JLUS region and includes an analysis of per capita income, wages and salaries, occupational mix, employment diversity, and employment concentration by wage. The section includes a discussion on educational achievement as a means of improving economic performance.

3.1 PER CAPITA INCOME

Per capita income is often seen as a measure of relative economic performance. Typically, the rate of economic progress is gauged by comparing regional rates with national averages over time, with the expectation that poor or under-performing areas will move closer to the average. For this report, per capita income is defined as income per person, made up of wages, salaries, benefits, investment income, and social assistance payments.

Exhibit 3.1 compares per capita income for the U.S. and the JLUS region's largest employment centers of Alamogordo, El Paso and Las Cruces for decennial years 1990 through 2010 and annually for more recent years 2011 and 2012. Data are adjusted for the cost of living using composite multipliers from the Council for Community and Economic Research's ACCRA Index. Because Alamogordo does not participate in the ACCRA program, an estimated index is derived from consumer spending in nearby Las Cruces, the nearest participating community. As such, cost-of-living data for Alamogordo are considered rough estimates and are rounded to the nearest full percentage point.

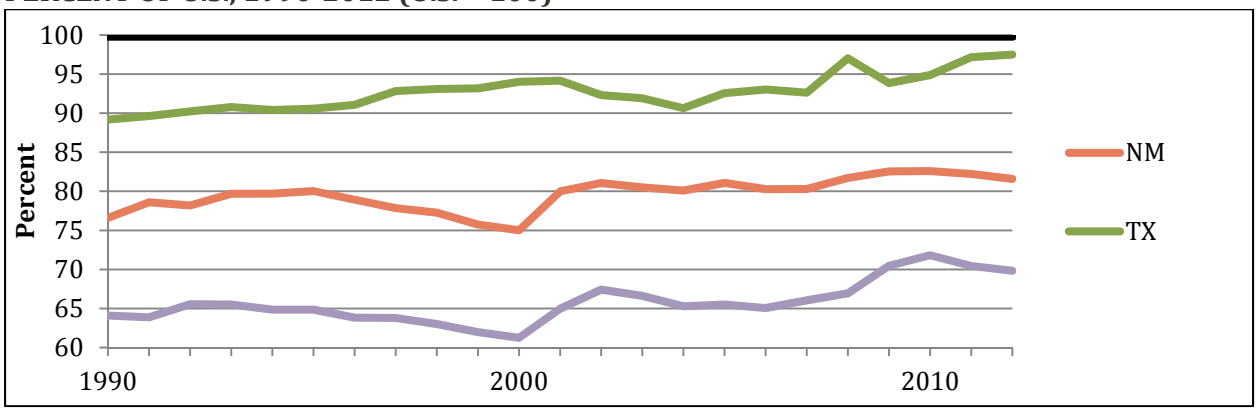
EXHIBIT 3.1 ANNUAL PER CAPITA INCOME COMPARISONS, 1990, 2000, 2010 & 2011 AND 2012

Year	US	Alamogordo			El Paso			Las Cruces		
		Actual	% US	% w/COL	Actual	% US	% w/COL	Actual	% US	% w/COL
1990	$ 19,354	$ 13,412	69.3	74.0	$ 12,246	63.3	68.9	$ 12,488	64.5	67.3
2000	30,319	17,572	58.0	62.0	18,796	62.0	67.5	18,090	59.7	62.2
2010	40,163	30,630	76.3	81.0	28,363	70.6	76.8	29,628	73.8	76.9
2011	42,298	31,524	74.5	79.0	29,315	69.3	75.4	30,488	72.1	75.2
2012	43,735	31,609	72.3	77.0	30,186	69.0	75.1	30,862	70.6	73.6

Source: Bureau of Economic Analysis, U.S. Department of Commerce. Found at www.bea.gov/
ACCRA Cost of Living Index (COL). Found at www.coli.org/

Income levels for the three cities are disappointing with the highest per capital value of $31,609 (Alamogordo) remaining a full 77.0% below the U.S. average. Although each city shows a gain over time, the JLUS region, as a whole, demonstrates a lack of sustained progress in this regard. Exhibit 3.2 shows the range of differences in per capita income for the JLUS counties compared to U.S. averages (set at 100%) from 1990 to 2012.

Exhibit 3.2 PER CAPITA INCOME FOR NEW MEXICO, TEXAS AND THE JLUS REGION AS PERCENT OF U.S., 1990-2012 (U.S. = 100)



Source: Bureau of Economic Analysis, U.S. Department of Commerce. Found at www.bea.gov/

3.2 REAL WAGES AND SALARIES

From 2003 through 2013, the JLUS cities of Alamogordo and Las Cruces saw real wages and salaries grow at annual rates (0.9% and 0.5%) that exceeded the national average (0.4%) for metropolitan areas. During this period, employment showed strength in El Paso and Las Cruces. In both cities, growth in job number actually exceeded growth in wages. From another perspective, El Paso and Las Cruces witnessed bigger contributions to total income from gains in employment than from rising wages. In Alamogordo, the average annual gain in nominal and real wages exceeded the nation. Alamogordo also matched the nation in job creation.

EXHIBIT 3.3 GAIN IN REAL WAGES AND SALARIES PER WORKER, 2003-2013

Year	Nominal Wages Per Worker			
	US Metros	Alamogordo	El Paso	Las Cruces
2003	$ 39,259	$ 24,539	$ 27,024	$ 26,243
2004	40,917	24,794	27,988	27,492
2005	42,253	25,892	28,666	28,569
2006	44,165	27,919	29,903	29,969
2007	46,139	28,810	31,354	31,422
2008	47,194	29,822	31,837	32,894
2009	47,127	31,405	32,665	34,264
2010	48,353	32,688	33,362	34,630
2011	49,644	33,359	34,045	34,807
2012	50,878	33,628	34,757	34,796
2013	51,158	33,650	34,761	34,635
% of U.S. (2013)	100.0	65.8	67.9	67.7
Average Annual Change in Wages Per Worker				
% Gain in Nominal Wages	2.7	3.2	2.6	2.8
(-) % Inflation	- 2.3	- 2.3	- 2.3	- 2.3
(=) % Gain Real Wages	0.4	0.9	0.3	0.5
Average Annual Change in Employment				
% Gain in Jobs	0.3	0.3	1.1	1.3

NOTE: Sums may not add to total due to rounding.
Source: U.S. Department of Labor, Bureau of Labor Statistics. Found at www.bls.gov/
Author's calculations.
P Preliminary

3.3 POVERTY INDICATOR

In regard to poverty, an indicator known as the "rich-to-poor ratio" can highlight the gap between rich and poor within a community or region. This measure is based on the number current households with incomes less than $25,000 compared to the number of households with incomes of $100,000 or more. For this indicator, the JLUS region reports 2.65 poor households for each rich household, a ratio substantially higher than ratios for New Mexico, Texas or the United States. The JLUS city partners of Alamogordo, El Paso and Las Cruces are included in the comparison (Exhibit 3.4) and reflect the region's higher ratio of poor to rich. Among the three, the city of El Paso demonstrates the greatest extreme with nearly three poor households for every rich household.

EXHIBIT 3.4 RATIO OF POOR TO RICH BASED ON HOUSEHOLD INCOME

Rich-Poor Ratio	US	NM	TX	JLUS major employment centers			Six-County Region
				Alamogordo	El Paso (city)	Las Cruces	
Number of households earning less than $25,000 annually vs. number of households reporting $100,000 or more	1.05	1.68	1.11	2.19	2.91	2.51	2.65

Source: Data derived from Selected Economic Characteristics, 2008-2012 American Community Survey 5-Year Estimates, Bureau of the Census, U.S. Department of Commerce. Found at www.census.gov/

3.4 OCCUPATIONAL MIX

The examination of real wages per worker (Exhibit 3.3 above) suggests that improving economic welfare in El Paso and Las Cruces may rely less on creating new jobs than on raising wages. This may also be true for the region as a whole. To test this observation, this report analyzes the number of regional jobs in both high- and low-wage occupations and compares the data with national averages.

Exhibit 3.5 lists average annual wages and salaries for major civilian occupations for the U.S., New Mexico, Texas and the JLUS region's three largest employment centers of Alamogordo, El Paso and Las Cruces. Shaded areas highlight regional wages that exceed the national average. Las Cruces, for example, pays wages higher than the national average in healthcare occupations and protective services (police, sheriff's deputies, guards, security personnel). El Paso pays a wage premium for protective service occupations, while the Alamogordo area pays premium wages in the category of farming, fishing and forestry and for jobs in production and transportation services. Nonetheless, the JLUS region generally fares poorly in this comparison with JLUS cities paying a premium in merely five of the 22 categories.

Exhibit 3.6 examines the concentration of jobs by occupation. The concentration value is defined as the percentage share of an occupation in the community. In this comparison, the JLUS cities demonstrate high concentrations of jobs in construction, office and administrative support, education and personal care services.

Exhibit 3.7 then ranks the concentration of the eight highest- and eight lowest-paid occupations for the U.S., New Mexico, Texas and the JLUS region as a whole. The Exhibit identifies the JLUS region as a weak magnet for high-paid occupations, ranking third out of four in the percentage concentration of high-paid occupations, and first of four with the highest percentage of low-paid jobs.

EXHIBIT 3.5 AVERAGE WAGE BY OCCUPATION WITH WAGE PREMIUM (SHADED)

	Average Annual Wage			Difference from U.S.		
	US	NM	TX	Alamogordo	El Paso	Las Cruces
All Occupations	$46,440	$41,470	$44,400	-$8,260	-$10,420	-$7,660
Management	110,550	90,800	110,680	-22,270	-16,540	-31,950
Business and Financial	71,020	60,260	71,640	-15,440	-12,830	-16,880
Computer and Mathematical	82,010	71,450	79,910	-28,180	-23,580	-10,160
Architecture and Engineering	80,100	81,010	89,160	-11,680	-9,260	-3,670
Life, Physical, and Social Sciences	69,400	75,600	73,380	-13,800	-15,010	-6,840
Community and Social Services	44,710	40,440	45,020	-5,850	-1,100	-2,750
Legal	99,620	75,110	98,110	-38,690	-5,430	-31,530
Education, Training, and Library	51,500	43,710	48,280	-7,300	-3,120	-2,500
Arts, Design, Entertain, Sports, Media	55,580	46,730	46,900	-22,030	-9,690	-18,950
Healthcare Practitioners and Techs	74,740	71,330	71,790	-3,300	-6,810	3,120
Healthcare Support	28,300	27,410	26,690	-4,440	-2,820	-1,790
Protective Services	43,510	39,630	40,580	-5,180	1,440	4,710
Food Preparation and Serving	21,580	20,760	20,290	-2,150	-2,780	-1,460
Building and Grounds Cleaning	26,010	22,560	22,140	-4,040	-5,340	-4,660
Personal Care and Service	24,710	21,440	20,840	-4,120	-6,160	-5,140
Sales and Related	38,200	30,130	38,810	-10,080	-9,260	-11,720
Office and Administrative Support	34,900	31,420	33,530	-5,650	-6,890	-7,540
Farming, Fishing, Forestry	24,330	22,220	25,010	1,470	-4,580	-4,720
Construction and Extraction	45,630	40,140	38,690	-3,430	-14,340	-12,430
Installation, Maintenance, Repair	44,420	41,980	41,790	-3,640	-10,060	-6,140
Production	34,930	35,150	34,700	1,350	-7,900	-4,250
Transportation and Material Moving	33,860	33,310	33,090	2,000	-6,230	-8,230

NOTES: Shading indicates a wage premium compared to federal averages. Values for Alamogordo are estimates based on wages for Otero County and eastern New Mexico.

Source: Bureau of Labor Statistics, Metropolitan and Non-metropolitan Area Occupational Employment and Wage Estimates. May 2013. Found at www.bls.gov (accessed March 3, 2014). Author's calculations.

EXHIBIT 3.6 JOB CONCENTRATION BY OCCUPATION WITH JOB PREMIUM (SHADED)

	% Employment by Occupation			Difference from U.S.		
	US	NM	TX	Alamogordo	El Paso	Las Cruces
All Occupations	100.00	100.00	100.00	0.00	0.00	0.00
Management	4.93	5.10	4.44	-0.33	-1.51	-0.32
Business and Financial	5.02	4.12	4.62	-2.27	-1.31	-1.36
Computer and Mathematical	2.79	1.78	2.84	-2.12	-1.68	-0.75
Architecture and Engineering	1.80	2.74	2.14	-0.40	-0.93	1.20
Life, Physical, and Social Sciences	0.86	1.41	0.74	-0.04	-0.36	0.17
Community and Social Services	1.43	1.73	0.91	-0.10	-0.18	0.74
Legal	0.79	0.72	0.67	-0.36	-0.23	-0.39
Education, Training, and Library	6.34	6.63	6.22	0.11	1.63	2.68
Arts, Design, Entertain, Sports, Media	1.33	1.06	0.96	-0.73	-0.61	-0.43
Healthcare Practitioners and Techs	5.85	5.54	5.27	-1.80	-0.72	-0.34
Healthcare Support	2.96	2.85	2.54	-0.42	-0.16	0.27
Protective Services	2.46	3.12	2.61	0.40	1.28	1.71
Food Preparation and Serving	8.99	9.76	9.10	0.95	1.12	0.73
Building and Grounds Cleaning	3.24	3.31	2.89	-0.03	-0.07	-0.01
Personal Care and Service	3.01	4.55	3.39	0.95	1.10	2.44
Sales and Related	10.61	9.70	10.81	-1.12	0.43	-1.83
Office and Administrative Support	16.17	15.48	17.14	-2.10	2.69	-0.53
Farming, Fishing, Forestry	0.33	0.36	0.13	0.09	-0.26	1.49
Construction and Extraction	3.84	6.67	5.19	8.71	-0.20	1.18
Installation, Maintenance, Repair	3.88	3.97	4.32	1.22	0.29	-0.72
Production	6.61	3.82	6.09	-2.13	-0.86	-2.42
Transportation and Material Moving	6.79	5.57	6.96	1.47	0.53	-3.53

NOTES: Shading indicates a wage premium compared to federal averages. Values for Alamogordo are estimates based on wages for Otero County and eastern New Mexico.

Source: Bureau of Labor Statistics, Metropolitan and Non-metropolitan Area Occupational Employment and Wage Estimates. May 2013. Found at www.bls.gov/ Author's calculations.

EXHIBIT 3.7 EMPLOYMENT CONCENTRATIONS IN HIGH- AND LOW-WAGE OCCUPATIONS FOR THE U.S., NEW MEXICO, TEXAS AND THE JLUS REGION

Ranking	High-wage occupations		Low-wage occupations	
	Ranking	% Jobs	Ranking	% Jobs
1	TX	26.94	JLUS	53.26
2	US	23.36	NM	51.58
3	JLUS	23.25	TX	48.24
4	NM	22.47	US	48.09

Source: Bureau of Labor Statistics, Metropolitan and Non-metropolitan Area Occupational Employment and Wage Estimates. May 2013. Found at www.bls.gov/ Author's calculations.

One key to moving up the occupational ladder is preparation of the workforce through education and training. The role of education is apparent as shown in Exhibit 2.11, which shows the educational attainment of those 25 years and older in the U.S., New Mexico, Texas the six JLUS counties and the SNM-El Paso region. Looking at the percentage of the population with college training, for example, we find the region well above the national norm for individuals without a high school diploma and falling short--even within Doña Ana County, which hosts both a community college and a large land grant research university--in meeting national averages for associate, bachelor and graduate degrees.

In some respects, the SNM-El Paso region's inability to capitalize on its assets – land, climate, cost of living, universities and military infrastructure – rests, at least in part, with the relatively poor educational achievement of its labor force. For the region, occupational wage and employment data, combined with information on educational attainment, suggest that building a more highly educated and better trained workforce may be an important factor in improving economic performance.

3.5 EMPLOYMENT DIVERSITY

Employment diversity ranks as an important factor in evaluating the resilience of a local economy. Diversity employment measures are quantitative tools used for this purpose. The measures are based on the principle that a broad-based economy is indicative of a strong economy, one that can more easily withstand downturns or economic insults. Several diversity measures are available. One measure is the Shannon-Weaver Diversity Index. It can be found online or may be calculated as such:

$$H' = -\sum_{i=1}^{S}[\, p_i \ln(p_i)\,] - [(S-1)/2N]$$

Where:

p_i = relative abundance of jobs in a given industry i, calculated as the number of jobs in a given industry to the total number of jobs in the community: $\frac{n_i}{N}$
n_i = number of jobs in an industry i
N = total number of all jobs in the community
S = total number of all possible industry sectors

The Shannon-Weaver value is calculated here for each JLUS county using 2012 data:

El Paso County	=	0.68561
Doña Ana County	=	0.67196
Lincoln County	=	0.67160
Sierra County	=	0.64041
Otero County	=	0.61140
Socorro County	=	0.56764

Using this method, the closer an economy comes to reaching full diversity, the closer its index value will be to 1. Among the JLUS counties, El Paso's Shannon-Weaver value demonstrates the greatest diversity. Doña Ana and Lincoln counties follow in second and third place, while Otero

and Socorro counties demonstrate the lowest diversity in employment. Of the six JLUS counties, Otero, with the third highest number of jobs, demonstrates the second lowest employment diversity score. This combination of strong job numbers and weak employment diversity demonstrates an economy especially vulnerable to downturns or change.

4.0 METHODOLOGY

An important objective of this report is to provide JLUS partners, the military and local officials with estimates of the economic impacts from employment and spending at the region's three military installations: Fort Bliss, Holloman AFB, and White Sands Missile Range. To accomplish this, the authors chose the method of Input-Output (I/O) analysis to model the military's impacts on jobs, incomes and industry output. Using I/O analysis, the report models the impacts for each JLUS county individually and then aggregates the data to determine overall impacts on the region. In each case, the model uses multipliers and assigns job impacts based on the county in which a worker resides, rather than the county of employment.

4.1 DATA COLLECTION

Exhibit 4.1 provides baseline employment and spending data (inputs) provided by each installation. The analysis is conducted using federal Fiscal Year (FY) 2013 data, which was found to be the most current across all installations and agencies. All three military installations participated in data collection, and a number of individuals at each installation were tapped to gather information on employment, local purchasing, military construction and contract spending. The AECOM team extends its sincere appreciation to the many officials who helped with this effort.

Included here is a list of officials by installation who served as points of contact for data collection:

Brian D. Knight, RPA
Conservation Branch, Environmental Division
Directorate of Public Works
Fort Bliss, Texas 79916

Mariette J. Mealor
Business Development Specialist
White Sands Missile Range, NM 88002

Capt. Stephanie L. Schonberger
Chief of Public Affairs
49th Wing
Holloman AFB, NM 88330

4.2 MILITARY INSTALLATIONS

FORT BLISS

Headquartered in El Paso, Texas, Fort Bliss ranks as the U.S. Army's second largest installation covering 1,700 square miles at the northern end of the Chihuahua Desert spanning areas of far 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 first 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 1916–1917 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.

HOLLOMAN AFB

On March 11, 2014, a crowd of 300 local supporters and a host of political dignitaries gathered at Holloman AFB to welcome its new tenant, the 54th Fighter Group, an F-16 training unit. The ceremony was a wistful event, precipitated by the loss of Holloman's F-22 advanced fighter jets, which had moved to Florida under an earlier Air Force fleet consolidation plan. Today, local officials remain optimistic about changes at the air base. With its new tenant, Holloman will soon acquire two squadrons of F-16's and begin training new pilots and support personnel, a net gain in aircraft and personnel at the 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.

The air base fills another role, serving as host to the German Air Force Tactical Training Center. German aircrews arrive at Holloman for approximately three weeks for advanced tactical training and then return to Germany. The German Air Force also conducts a Fighter Weapons Instructor Course for the Panavia Tornado aircraft. Aircrews for this course train at Holloman for about six months. In March 2013, the German Air Force announced the transfer of German Air Force units from Fort Bliss to Holloman. Today, more than 500 German Air Force members are permanently assigned to the air base.

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.

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 (whose acronym, WSMR, is pronounced "Whiz-Mer" by nearby residents).

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.

In addition to firing rockets and missiles, the Range today has developed launch facilities in other areas of New Mexico, Utah, and Idaho 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. 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.

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

Today, WSMR is managed by the U.S. Army as a military research, testing, and support facility with large expanses of land and unlimited top-to-bottom airspace for the 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.

EXHIBIT 4.1 INPUT DATA FOR EMPLOYMENT AND SPENDING BY INSTALLATION, 2013

Installation	Employment				Spending			
	Active Duty Guard & Reserve	Federal Civilian Appropriated	Contractor & Unappropriated	Total	Construction	General Contracting	Local Purchasing	Total
FORT BLISS	31,033	3,503	7,267	41,803	$216,123,342	$851,169,325	$4,219,411	$1,071,512,078
HOLLOMAN AFB	4,171	845	455	5,471	13,711,247	45,162,471	2,030,561	60,904,279
GERMAN AF	482	58	-	540	–	–	–	–
WHITE SANDS MISSILE RANGE	1,066	1,961	2,954	5,981	6,605,334	315,995,651	2,659,747	325,260,732
TOTAL	36,752	6,367	10,676	53,795	$236,439,923	$1,212,327,447	$8,909,719	$1,457,677.089

Source: Environmental Division, Directorate of Public Works, Fort Bliss; Strategic Initiatives, WSMR; and Public Affairs Office, 49th Wing, Holloman, AFB. Construction and General Contracting data retrieved from Federal Procurement Data Center, NG at https://www.fpds.gov/. Local purchasing (P-card) data provided by installation or military command.

4.3 DATA ANALYSIS

Input-Output (I/O) analysis is a scientifically reliable method for measuring the economic consequences of changes in employment or spending. The method is used here to determine the impacts on employment (jobs), labor income (salaries and wages), and total industry output (value of materials, services, labor and inter-industry dependencies) on the six-county SNM-El Paso region and individually within each of the six counties.

The equation for I/O modeling can be written as:

$$\Delta\gamma = (I - \alpha)^{-1}\,\Delta x$$

Where:

$\Delta\gamma$ = Change in total employment, labor income or industry output

$(I - \alpha)^{-1}$ = Multiplier, based on interdependence coefficients (I-a)

Δx = Change in employment or spending at military installation

Information on the industry linkages with Fort Bliss, Holloman and WSMR is obtained from the IMPLAN 3.1.1001 database, a modeling program used to estimate the impact of changes in employment and spending in 440 industry sectors nationwide. An older version of the IMPLAN software was used by DOD and its military services for impact estimations during the 2005 BRAC process.

For this effort, the analysis takes into account two kinds of spending: (1) local military procurement, military construction and general contracting and (2) household spending from military and federal civilian employment. The impacts from employment and spending at each installation are calculated as the sum of the direct, indirect and induced effects.

TERM	DEFINITION
Direct effect	A change in expenditure, production or employment by an industry.
Indirect effect	The effects of inter-industry spending traveling back through the supply chain.
Induced effect	The results of household spending from the wages and salaries paid by the directly and indirectly affected industries.
Total effect	The sum of the direct, indirect and induced effects from changes in expenditure, production or employment by an industry.

To determine the impact from military spending on procurement, construction and general contracting, the model accounts for the type of industry receiving the funds at the local level. For example, much of the spending at WSMR serves a research, testing and support mission. This differs from spending on military construction, which has occurred at Fort Bliss. To account for this difference, the

IMPLAN database provides separate industries sectors for "Scientific Research and Development" (376) and "Non-residential Construction" (36).

For this analysis, military jobs are modeled using the military industry (440) sector as a proxy. Federal civilian employment is modeled as part of the region's federal government sector (439). To account for periods of military deployment to Afghanistan and elsewhere, an adjustment factor of 0.85 is used on household spending for active duty military, a standard percentage for studies of this type.

The model estimates economic impact or, from another perspective, the gain (or loss) to the region should local military employment or spending be increased (or reduced). The model does not predict the expansion or reduction of an installation or a military tenant organization.

A word here about I/O modeling: No single analytical technique is perfect for all purposes. As such, the following statements describe some assumptions of I/O modeling that should be taken into account when interpreting the results of this analysis:

- Impacts are calculated as numerically linear and proportional to changes in spending;
- Each industry is assumed to have unlimited access to the materials necessary for its production at prices currently charged for those materials;
- Changes in the economy are assumed to affect an industry's output but will not alter the mix of materials and services that are required to make an industry's products; and
- Each industry is treated as if it provides a single primary or main product, and all other products of that industry are viewed as byproducts.

4.4 IMPACT ANALYSIS AND MULTIPLIERS

Impact analysis involves the use of multipliers [the $(I - \alpha)^{-1}$ in the earlier equation] to estimate the direct, indirect and induced impacts of a change in spending on a regional economy. The premise underlying the multiplier method is that one individual's spending translates into another person's income. An initial injection of funds into an economy stimulates the recipient to spend. The spending becomes income for another. The second recipient will spend some of that income, which becomes a third recipient's income, and so on. In most cases, not all of the initial injection of funds will stay in the local economy. Some income will be saved; some will be paid in taxes; and some will be spent on goods and services outside of the local area.

As a rule, the size of a community's multiplier is a function of the local economy's propensity to import from outside the area, the inclination of individuals to save and the amount of taxes paid. For the current study, hundreds of multipliers are calculated specific to the SNM-El Paso region, each of the region's six counties and for each of the region's active industrial sectors.

An example of employment multipliers used in the study:[4]

Construction of non-residential structures	1.578077
Engineering services	1.682023
Environmental consulting	1.644253
Security services	1.664822
Scientific research & development	1.669689

5.0 FINDINGS

This section shows estimated impacts from employment and spending at Fort Bliss, Holloman AFB and WSMR by region, installation and county. Impacts are identified for employment, labor income and total industry output. Employment is defined as the number of full- and part-time annual average jobs for employees and self-employed individuals. Seasonal workers are counted based on duration of employment. For example, if 12 construction workers each worked six months, they would account for six annual full time equivalent jobs. Labor income is calculated as the sum of wages and benefits paid to employees plus the profits earned by self-employed workers. Industry output is calculated here as the dollar value of production of all industries impacted by regional military employment and spending.

Total impacts are presented as a percentage (fifth column in each table) of their contribution to the region's total economy.

5.1 REGIONAL ESTIMATES

Regional estimates identify impacts for the six-county region from military employment and spending at all three installations. The summary data represent the largest dollar values and job impacts in this report.

[4] Normally, two- and three-digit multipliers are adequate for presenting the results of I/O analysis. However, more precise multipliers were required for this analysis to model effectively the large absolute values associated with regional military spending.

EXHIBIT 5.1 SUMMARY IMPACTS OF MILITARY EMPLOYMENT AND SPENDING ON THE JLUS REGION, 2013

	Military & Civilian Appropriated	Contractor, Construction & Local Procurement	Totals	% Regional Total
Employment (job number)				
Direct	42,540	20,780	63,320	
Indirect	0	6,010	6,010	
Induced	20,480	6,440	26,440	
Total	63,020	33,230	96,250	17.9
Labor Income (000s $)				
Direct	3,962,468	985,252	4,947,720	
Indirect	0	215,123	215,123	
Induced	742,430	232,072	974,502	
Total	4,704,898	1,432,447	6,137,345	24.9
Industry Output (000s $)				
Direct	7,147,517	2,696,931	9,844,448	
Indirect	0	621,174	621,174	
Induced	2,386,535	743,341	3,129,876	
Total	9,534,052	4,061,446	13,595,498	18.9

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations. Note: Numbers may not add up due to rounding.

As shown, the analysis finds military employment and spending account for an estimated 96,250 jobs, $6.1 billion in annual income and $13.6 billion in industry output. The estimates represent an astonishing 17.9% of all regional jobs, 24.9% of earned income and 18.9% of total industry output.

The analysis also estimates the contribution to the region's economy by each military installation, modeled separately (Exhibit 5.2). Fort Bliss, easily the largest of the three installations both in employment and spending, also accounts for the greatest share of the military's impact on the region. WSMR and Holloman AFB rank second and third, respectively.

While Fort Bliss accounts for the largest share of the region's military impact, a list of the nation's domestic installations by land area published by the Office of the Under Secretary of Defense[5] demonstrates that WSMR and Holloman are by no means insignificant, ranking first and twelfth, respectively, by their military services. Only in reference to Fort Bliss, an enormous complex both in size and population, do the nearby installations appear small by comparison. Were Fort Bliss removed from the analysis, for example, impacts to regional employment and labor income would remain high by any standard.

[5] *Base Structure Report, FY 2012 Baseline, Office of the Under Secretary of Defense, U.S. Department of Defense. Found at http://www.acq.osd.mil; accessed Aug. 8, 2014.*

EXHIBIT 5.2 IMPACTS OF MILITARY EMPLOYMENT AND SPENDING ON THE JLUS REGION BY INSTALLATION, 2013

	Military & Civilian Appropriated	Contractor, Construction & Local Procurement	Totals	% Regional Total
FORT BLISS				
Employment (job number)				
Direct	34,180	13,670	47,850	
Indirect	0	4,270	4,270	
Induced	17,470	4,290	21,760	
Total	51,650	22,230	73,880	13.7
Labor Income (thousands of $)				
Direct	3,201,056	620,754	3,821,810	
Indirect	0	153,807	153,807	
Induced	640,997	155,333	796,330	
Total	3,842,052	929,895	4,771,947	19.4
Industry Output (thousands of $)				
Direct	5,389,136	1,885,795	7,274,931	
Indirect	0	440,974	440,974	
Induced	2,053,888	498,678	2,552,566	
Total	7,443,024	2,825,447	10,268,471	14.3
HOLLOMAN AFB				
Employment (job number)				
Direct	5,440	1,170	6,610	
Indirect	0	230	230	
Induced	1,710	310	2,020	
Total	7,150	1,720	8,870	1.7
Labor Income (thousands of $)				
Direct	476,927	59,078	536,005	
Indirect	0	8,254	8,254	
Induced	55,039	10,617	65,655	
Total	531,966	77,949	609,915	2.5
Industry Output (thousands of $)				
Direct	1,220,892	140,098	1,360,990	
Indirect	0	26,364	26,364	
Induced	187,725	34,660	222,385	
Total	1,408,617	201,121	1,609,738	2.2
WSMR				
Employment (job number)				
Direct	2,920	5,940	8,860	
Indirect	0	1,500	1,500	
Induced	1,310	1,850	3,150	
Total	4,230	9,290	13,510	2.5
Labor Income (thousands of $)				
Direct	284,486	305,420	589,906	
Indirect	0	53,061	53,061	
Induced	46,394	66,122	112,516	
Total	330,880	424,603	755,483	3.1
Industry Output (thousands of $)				
Direct	537,489	671,038	1,208,527	
Indirect	0	153,837	153,837	
Induced	144,922	210,003	354,925	
Total	682,411	1,034,878	1,717,289	2.4

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations.
Note: Numbers may not add up due to rounding.

5.2 COUNTY ESTIMATES

In this section, impacts are estimated for each of the JLUS's six member counties. As with summary impacts (Exhibit 5.1), the data represent the sum of direct, indirect and induced effects from regional military employment and spending. In the column to the right, impact totals are presented as a percentage of their contribution to the county's total economy. At the request of the JLUS Technical Committee a second table was added for each county identifying the separate impacts each from Fort Bliss, Holloman and WSMR.

EXHIBIT 5.3 IMPACTS OF MILITARY EMPLOYMENT AND SPENDING ON DOÑA ANA COUNTY BY INSTALLATION, 2013

	Fort Bliss	Holloman AFB	WSMR	Totals	% County Total
Employment (job number)					
Direct	4,270	290	4,810	9,360	
Indirect	350	30	670	1,050	
Induced	1,070	110	1,640	2,810	
TOTAL	5,690	430	7,110	13,220	14.6
Labor Income (000s $)					
Direct	222,065	22,713	332,459	577,237	
Indirect	13,091	1,303	24,228	38,622	
Induced	37,897	3,753	58,290	99,940	
TOTAL	273,053	27,769	414,977	715,800	17.6
Industry Output (000s $)					
Direct	755,001	44,917	701,857	1,501,775	
Indirect	35,247	3,499	66,733	105,480	
Induced	116,048	11,409	179,132	306,589	
TOTAL	906,296	59,825	947,722	1,913,843	18.6

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations. Note: Numbers may not add up due to rounding.

EXHIBIT 5.4 IMPACTS OF MILITARY EMPLOYMENT AND SPENDING ON EL PASO COUNTY BY INSTALLATION, 2013

	Fort Bliss	Holloman AFB	WSMR	Totals	% County Total
Employment (job number)					
Direct	43,060	160	3,100	46,320	
Indirect	3,830	30	690	4,550	
Induced	20,530	70	1,230	21,840	
TOTAL	67,420	260	5,030	72,710	18.5
Labor Income (000s $)					
Direct	3,567,795	12,377	197,293	3,777,466	
Indirect	137,593	899	24,031	162,523	
Induced	753,130	2,695	44,977	800,800	
TOTAL	4,458,517	15,970	266,301	4,740,788	25.8
Industry Output (000s $)					
Direct	6,438,134	23,257	391,339	6,852,731	
Indirect	396,755	2,742	72,161	471,659	
Induced	2,418,824	8,651	144,549	2,572,024	
TOTAL	9,253,713	34,650	608,050	9,896,414	17.9

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations. Note: Numbers may not add up due to rounding.

EXHIBIT 5.5 IMPACTS OF MILITARY EMPLOYMENT AND SPENDING ON LINCOLN COUNTY BY INSTALLATION, 2013

	Fort Bliss	Holloman AFB	WSMR	Totals	% County Total
Employment (job number)					
Direct	200	260	110	560	
Indirect	40	30	20	90	
Induced	60	80	40	180	
TOTAL	300	370	160	830	7.5
Labor Income (000s $)					
Direct	10,662	15,567	6,289	32,518	
Indirect	1,404	930	598	2,931	
Induced	2,087	2,572	1,162	5,822	
TOTAL	14,153	19,069	8,049	41,271	12.6
Industry Output (000s $)					
Direct	26,494	33,337	11,631	71,462	
Indirect	4,038	3,008	1,836	8,881	
Induced	6,918	8,694	3,870	19,482	
TOTAL	37,450	45,038	17,337	99,826	9.1

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations. Note: Numbers may not add up due to rounding.

EXHIBIT 5.6 IMPACTS OF MILITARY EMPLOYMENT AND SPENDING ON OTERO COUNTY BY INSTALLATION, 2013

	Fort Bliss	Holloman AFB	WSMR	Totals	% County Total
Employment (job number)					
Direct	290	5,850	520	6,650	
Indirect	40	140	80	270	
Induced	90	1,750	160	2,000	
TOTAL	420	7,740	760	8,910	30.6
Labor Income (000s $)					
Direct	19,425	482,454	33,857	535,735	
Indirect	1,572	5,042	2,771	9,385	
Induced	2,969	56,344	5,408	64,722	
TOTAL	23,966	543,840	42,036	609,842	45.4
Industry Output (000s $)					
Direct	49,584	1,250,695	63,250	1,363,528	
Indirect	4,498	16,834	8,540	29,872	
Induced	9,904	192,543	17,955	220,402	
TOTAL	63,985	1,460,072	89,745	1,613,802	43.3

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations. Note: Numbers may not add up due to rounding.

EXHIBIT 5.7 IMPACTS OF MILITARY EMPLOYMENT AND SPENDING ON SIERRA COUNTY BY INSTALLATION, 2013

	Fort Bliss	Holloman AFB	WSMR	Totals	% County Total
Employment (job number)					
Direct	20	30	130	170	
Indirect	< 5	< 5	20	20	
Induced	< 5	< 5	40	50	
TOTAL	20	30	190	240	4.5
Labor Income (000s $)					
Direct	1,035	1,473	9,032	11,540	
Indirect	73	38	558	670	
Induced	128	140	1,122	1,391	
TOTAL	1,236	1,651	10,712	13,600	7.5
Industry Output (000s $)					
Direct	9,032	12,949	16,949	24,085	
Indirect	558	1,027	1,748	2,089	
Induced	1,122	2,512	4,028	5,024	
TOTAL	10,712	16,488	22,724	31,197	5.4

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations. Note: Numbers may not add up due to rounding.

EXHIBIT 5.8 IMPACTS OF MILITARY EMPLOYMENT AND SPENDING ON SOCORRO COUNTY BY INSTALLATION, 2013

	Fort Bliss	Holloman AFB	WSMR	Totals	% County Total
Employment (job number)					
Direct	20	30	200	240	
Indirect	< 5	< 5	30	30	
Induced	< 5	10	50	60	
TOTAL	20	40	270	330	4.0
Labor Income (000s $)					
Direct	828	1,421	10,976	13,225	
Indirect	76	42	874	992	
Induced	118	152	1,557	1,827	
TOTAL	1,022	1,616	13,407	16,045	4.9
Industry Output (000s $)					
Direct	2,612	4,755	23,501	30,867	
Indirect	224	151	2,819	3,195	
Induced	410	554	5,391	6,355	
TOTAL	3,246	5,460	31,711	40,417	4.6

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations. Note: Numbers may not add up due to rounding.

As shown, estimated impacts are greatest in counties that host military installations. Impacts of 14.6 to 45.4% of county totals are measured in employment, labor income and industry output for Doña Ana, El Paso and Otero counties. Smaller impacts of 4.0 to 12.6% are measured in the non-installation counties of Lincoln, Sierra and Socorro. Nevertheless, impacts from employment and spending at military installations are rarely contained within a single county. Fort Bliss and its testing and training ranges, for example, overlie the JLUS counties of El Paso, Doña Ana and Otero. Commuting patterns identified in the Census Bureau's "Journey to Work" survey confirm these cross-county linkages (Exhibit 5.13).

5.3 COMMUTING PATTERNS

For this report, impacts from military employment are assigned to an employee's place of residence. As an example, impacts from a Sierra County contractor who commutes to WSMR headquarters are allocated to Sierra County and not Doña Ana County, the installation's host county. To obtain commuter information, the analysis relies on the Census Bureau's Journey to Work survey and data from the Bureau of Economic Analysis. The assignment of impact by county of residence was requested by the JLUS partners and may not be typical of other I/O analyses.

EXHIBIT 5.9 REGIONAL COMMUTING PATTERNS FOR TRAVEL TO FORT BLISS, HOLLOMAN AFB AND WSMR, 2006-2010

County of Residence	% Commuters
FORT BLISS	
El Paso	87.14
Doña Ana	9.91
Otero	1.56
Lincoln	0.25
Other	< 2.00
HOLLOMAN AFB	
Otero	76.43
Lincoln	9.69
Doña Ana	8.87
El Paso	4.21
Other	< 1.00
WSMR	
Doña Ana	48.54
El Paso	37.34
Otero	8.56
Sierra	1.62
Lincoln	1.54
Other	< 3.00

Source: Journey to Work Survey, American Community Survey, 2006-2010. Found at www.census.gov/
Bureau of Economic Analysis. Found at www.bea.gov/

5.4 IMPACTS OF SPACEPORT AMERICA (NEW MEXICO SPACEPORT)

New Mexico's Spaceport America is a state-owned facility located in Sierra County, adjacent to the western extension or western call-up area of WSMR. The facility is currently operated by a professional staff of state and contract employees under the direction of the New Mexico Spaceport Authority, a governor-appointed board. The Authority has signed a 20-year lease agreement with Richard Branson's Virgin Galactic company to initiate tourism-style suborbital space flights. As of 2014, the Spaceport had hosted more than 20 non-manned vertical launches for customers in the commercial space industry.

In land area, the Spaceport incorporates 18,000 acres, and the facility hosts a 12,000-foot runway (space way) and an 110,000-square-foot terminal or "Gateway to Space" building with hangar areas for space craft.

An estimate is provided here of the impacts of the Spaceport on the JLUS region as measured by employment, labor income and industry output. The impacts are provided separately as the Spaceport remains outside of military jurisdiction, but relies on support and recovery services supplied by WSMR. Spaceport America intends to evolve into a commercial hub for suborbital tourism, marketing and research.

EXHIBIT 5.10 ESTIMATED IMPACTS OF THE NEW MEXICO SPACEPORT ON THE JLUS SIX-COUNTY REGION, 2013

	Employment	General Contracting/ Maintenance	Construction	Total
Employment (job number)				
Direct	9	25	58	
Indirect	0	6	20	
Induced	3	8	21	
Total	12	39	99	150
Labor Income (thousands of $)				
Direct	450	1,227	2,776	
Indirect	0	205	868	
Induced	93	294	742	
Total	543	1,726	4,386	6,655
Total Industry Output (thousands of $)				
Direct	539	2,693	8,800	
Indirect	0	596	2,741	
Induced	298	946	2,387	
Total	837	4,235	13,928	19,000

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations. Note: Numbers may not add up due to rounding.

6.0 SUMMARY

This report analyzes the impact of employment and spending associated with Fort Bliss, Holloman AFB and WSMR on a 27,173-square-mile (70,378 km^2) region of southern New Mexico and far west Texas. Counties included in the analysis are New Mexico's Doña Ana, Lincoln, Otero, Sierra and Socorro counties and El Paso County in Texas. The report provides a separate analysis for Spaceport America, a state-owned enterprise with launch facilities in New Mexico's Sierra County, which benefits from technical support at nearby WSMR. The geographic scope of this analysis is large, comparable in size to the sovereign nation of Ireland. Certain impacts are measured in the billions of dollars. In many respects, the report represents one of the largest studies undertaken by DOD's Office of Economic Adjustment.

The report itself is part of a larger effort undertaken by the JLUS partnership to develop recommendations for land use planning that are compatible with the missions of the region's three military installations. The economic impact portion of the study supports the larger study and may be useful to local planners and economic development officials. The data may be used to determine potential impacts at the regional and county levels were a change made to the mission at any of three installations. A summary of regional military impacts is provided here:

EXHIBIT 6.1 SUMMARY IMPACTS FROM EMPLOYMENT AND SPENDING AT FORT BLISS, HOLLOMAN AFB AND WSMR, 2013

	Impacts	% Regional Total
Employment (job number)		
Direct	63,320	
Indirect	6,010	
Induced	26,440	
Total	96,250	17.9
Labor Income (thousands of $)		
Direct	4,947,720	
Indirect	215,123	
Induced	974,502	
Total	6,137,345	24.9
Industry Output (thousands of $)		
Direct	9,844,448	
Indirect	621,174	
Induced	3,129,876	
Total	13,595,498	18.9

Source: Impacts modeled in IMPLAN v. 3.1.1001. Author's calculations.

Based on the summary, Fort Bliss, Holloman AFB and WSMR together account for 96,250 in regional jobs, $6.1 billion in wages and salaries, and $13.6 billion in industry output. Job impacts represent 17.9% of total regional employment; or stated in another way, ***about one in every five-and-a-half jobs in the six-county JLUS region is associated with employment and spending at the three military installations***. Income from the installations represents 24.9% of all earned income, or one in every four dollars in wages or salaries. In terms of industry output, Fort Bliss, Holloman AFB and WSMR together account for 18.9% of all activity, or about one in every five dollars of regional output value.

The scale of these impacts is large. They highlight a region whose economy is tied to, if not dependent, on military employment and spending. The region hosts no known employers that could replace the beneficial economic impacts to jobs, incomes and industry were any of the three installations to close or experience a large cutback.