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Center for Economic Research • (520) 515-5486 (voice) • (520) 515-5343 (fax)
Email: cer@cochise.edu • Web address: www.cochise.edu/cer

U.S. Army Environmental Command
ATTN: SPEA Public Comments
2450 Connell Road (Building 2264)
Joint Base San Antonio-Fort Sam Houston, TX 78234-7664

August 14, 2014

Subject: Public Comment Input to Supplemental Programmatic Environmental Assessment for Army 2020 Force Structure Realignment / Fort Huachuca Socioeconomic Impact

Dear Colonel Lee,

In response to the call for public comments regarding the *Supplemental Programmatic Environmental Assessment for Army 2020 Force Structure Realignment*, this letter and the attached document relating to the socioeconomic impacts of downsizing Fort Huachuca, AZ are provided.

A review of the SPEA by the Cochise College Center for Economic Research identifies serious problems in methodology resulting in an understatement of impacts associated with Fort Huachuca. This is due to use of the nearly 6,200 square-mile area of Cochise County, AZ as the region of influence, which extends far beyond where Fort Huachuca soldiers, civilians, and their families generally live, work, and shop. The problem is exacerbated when making comparisons to other installations (where this limitation does not apply) due to vastly different land areas of ROIs (stemming primarily from the inability of the Army's Economic Impact Forecast System to disaggregate county-level data) and lack of supplemental analysis by USAEC to standardize ROIs or control for their very dissimilar land areas.

Looking at just seven of the 30 installations assessed in the SPEA (including Fort Huachuca and those similar in size) reveals land areas of ROIs ranging from 463 square miles (Fort Leavenworth, KS) to more than 20,000 square miles (Fort Irwin, CA). Fort Huachuca is assigned the second largest ROI of the seven at nearly 6,200 square miles. One of the primary determinants of whether an ROI will be deemed significantly impacted in the SPEA is its geographical size. The larger the land area, the less likely impacts are to be deemed significant, other things equal. There is no rational justification to assume Army soldiers, civilians, and their families assigned to Fort Huachuca will generally live, work, and shop in an area nearly 6,200 square miles, or those assigned to Fort Irwin will live, work, and shop in an area that is more than 20,000 square miles, while those stationed at Fort Leavenworth will confine themselves to only 463 square miles. The result is a system of analysis and assessment within the SPEA that is not uniform and does not offer fair and valid comparisons of the significance of socioeconomic impacts

among affected Army installations. Rational ROIs would be more or less uniform in geographical size and reflective of typical drive/commuting times and distances or other demographic patterns.

While the SPEA acknowledges that EIFS cannot disaggregate county-level data to construct more accurate and uniform ROIs, that qualification should not be the final word. Rather, additional study is necessary to control for that limitation—otherwise the model’s assumption errors dictate the research results, as is the case in the draft SPEA. Adjustments, although not included within the functionality of the EIFS computer model, can easily be made using readily available data on such variables as land area of the ROI and average commute times to work, or through individual localized research such as that in the attached paper. Significant differences in the land area of ROIs should be explained by land use analysis, drive times, demographic patterns, and/or other relevant factors—not simply EIFS computer model limitations for which adjustments can be made, but are not. For analysis as important as that in Table FNSI-4 of the SPEA, for example, it is crucial that ROIs be standardized and reflective of the areas in which installation employees and their families generally live, work, and shop, or that adjustments to SPEA findings regarding significance of impacts be made for geographically large counties that cannot feasibly be tailored to be consistent with those of other installations.

The SPEA also excludes analysis of impacts associated with Fort Huachuca that have already occurred and have had, and will continue to have, a detrimental effect on the local economy, specifically: (1) a reduction in defense contracting activities and the loss of several thousand jobs associated with the fort that have already occurred, (2) a decline in temporary duty travel to the fort for training and conferences, (3) a 35% drop in the fort’s average daily student load, (4) changes in Army lodging policies that have decimated the area’s accommodation industry, and (5) other significant Fort Huachuca-related drawdowns that have occurred since 2009. In addition to harming the economy in ways not addressed in the SPEA, these have skewed historical ranges relied upon in the SPEA to determine whether impacts are significant.

Correcting assumption errors—specifically, a narrower ROI to include only areas where the fort’s employees and their families live, work, and shop, along with adjustments to historical ranges to account for declines attributable to Fort Huachuca that have already occurred—would, in all likelihood, show significant impacts on sales and income (in addition to employment and population, which the SPEA already concludes would be significantly impacted). To control for assumption errors, it is recommended the socioeconomic impacts of sales and income related to downsizing Fort Huachuca be deemed significant (in addition to employment and population) and the main points of this letter and findings in the attached document be incorporated into a revised SPEA.

Thank you for your consideration of this input; please feel free to contact me at (520) 515-5370 or CarreiraR@cochise.edu if you have any questions.

//Original Signed//
Robert Carreira, Ph.D.
Director



COCHISE COLLEGE

Center for Economic Research

Review of Supplemental Programmatic Environmental Assessment for Army 2020 Force Structure Realignment: Fort Huachuca Socioeconomic Impact

August 4, 2014

By Robert Carreira, Ph.D., Director, Center for Economic Research, Cochise College

EXECUTIVE SUMMARY

This paper presents a review of the *Supplemental Programmatic Environmental Assessment for Army 2020 Force Structure Realignment* (SPEA) as it regards socioeconomic impacts related to downsizing Fort Huachuca, AZ. While the SPEA methodology is sound, in general, for forecasting economic impacts, problems arise in its application to Fort Huachuca resulting in an understatement of impacts. This is due to use of the entire 6,166 square-mile area of Cochise County, AZ as the region of influence (ROI), which extends far beyond where Fort Huachuca soldiers, civilians, and their families generally live, work, and shop. The problem is exacerbated when making comparisons to other installations (where this limitation does not apply) due to vastly different land areas of ROIs (stemming from the inability of the Army's Economic Impact Forecast System to disaggregate county-level data) and lack of supplemental analysis to standardize ROIs or control for their very dissimilar land areas. The SPEA also excludes analysis of impacts associated with Fort Huachuca that have already occurred and have had, and will continue to have, a detrimental effect on the local economy, specifically: (1) a reduction in defense contracting activities, (2) a decline in temporary duty travel to the fort, (3) a drop in the fort's average daily student load, and (4) changes in Army lodging policies that have decimated the area's accommodation industry. In addition to harming the economy in ways not addressed in the SPEA, these have skewed historical ranges relied upon in the SPEA to determine whether impacts are significant. Correcting assumption errors—specifically, a narrower ROI to reflect only those areas where the fort's employees and their families live, work, and shop, along with adjustments to historical ranges to account for declines attributable to Fort Huachuca that have already occurred—would, in all likelihood, show significant impacts on sales and income (in addition to employment and population, which the SPEA already concludes would be significantly impacted). To control for assumption errors, it is recommended the socioeconomic impacts of sales and income related to downsizing Fort Huachuca be deemed significant (in addition to employment and population) taking into account percentage-point declines that are likely 30% to 50% steeper than those forecasted in the SPEA, along with narrower historical ranges when factoring out recent Fort Huachuca-related declines in population and economic activity that have affected those ranges. The findings in this document should be incorporated into a revised SPEA.

INTRODUCTION

This paper presents the results of the Cochise College Center for Economic Research's review of the U.S. Army Environmental Command's (USAEC) *Supplemental Programmatic Environmental Assessment for Army 2020 Force Structure Realignment* (SPEA) as it regards socioeconomic impacts related to Fort Huachuca, AZ (Chapter 4, Section 4.11.12) forecasted to arise from the proposed maximum reduction of 2,739 active duty and Army civilian positions. While the methodology used by USAEC is generally sound and commonly accepted for forecasting economic impacts at the individual Army installation level, problems arise in its application to Fort Huachuca that result in an understatement of impacts. This is due to the use of the entire 6,166 square-mile area of Cochise County, AZ as the impact study area/region of influence (ROI), which extends far beyond the area in which Fort Huachuca soldiers, civilians, and their families generally live, work, and shop. The problem is exacerbated when making comparisons to other Army installations (where this limitation does not apply) due to vastly different land areas of the ROIs (stemming from the inability of the Army's Economic Impact Forecast System [EIFS] to disaggregate county-level data) and the lack of supplemental analysis by USAEC to standardize ROIs or control for their very dissimilar land areas. The result is a system of analysis and assessment within the SPEA that is not uniform and does not offer fair and valid comparisons of the significance of socioeconomic impacts among affected Army installations.

One of the primary determinants of whether an ROI will be deemed significantly impacted in the SPEA is its geographical size. The larger the area, the less likely impacts are to be deemed significant, other things equal. That is because larger-area sales, income, jobs, and population are used to calculate percent changes, resulting mathematically in smaller changes. The ROIs used in the SPEA are drawn along county lines with no adjustment for counties that are unusually, geographically large and not representative of where the installation's soldiers, civilians, and their families generally live, work, and shop. While the SPEA acknowledges that EIFS cannot disaggregate county-level data to construct more accurate and uniform ROIs, that qualification should not be the final word. Rather, additional study is necessary to control for that limitation—otherwise the model's assumption errors dictate the research results, as is the case in the draft SPEA. Adjustments, although not included within the functionality of the EIFS computer model, can be made using readily available data on such variables as the land area of the ROI and average commute times to work, or through individual localized research such as that presented in this paper. Significant differences in the land area of ROIs should be explained by land use analysis, drive times, and/or other relevant factors—not simply EIFS computer model limitations for which adjustments can be made but are not. For analysis as important as that in Table FNSI-4 of the SPEA, for example, it is crucial that ROIs be standardized and reflective of the areas in which installation employees and their families generally live, work, and shop, or that adjustments to SPEA findings regarding the significance of impacts be made for geographically large counties that cannot feasibly be tailored to be consistent with the size of ROIs selected for other installations. Differences in land area of ROIs among SPEA-assessed installations should be explained and justifiable (based on relevant factors—not simply EIFS computer modeling limitations) and controlled for in the analysis to the extent practicable.

The SPEA methodology also excludes study of certain drawdown effects associated with Fort Huachuca that have already occurred and have had, and will continue to have, a detrimental impact on the economy of the Sierra Vista area of Cochise County; specifically, these are: (1) a reduction in defense contracting activities and a loss of defense contracting jobs, (2) a decline in temporary duty travel to the fort for training and conferences, (3) a 35% drop in the fort's average daily student load from more than 3,200 in 2010 to approximately 2,100 in 2013 (according to input by Fort Huachuca Public Affairs Office to the Cochise College Center for Economic Research's annual *Sierra Vista Economic Outlook* publications), and (4) changes in Army lodging policies that have decimated the area's off-post accommodation industry. These impacts have been ongoing for several years and are likely to continue and worsen as a result of the proposed Army 2020 Force Structure Realignment, along with other budgetary cuts independent of the proposed realignment. In addition to being harmful economic effects associated with Fort Huachuca that are not measured or addressed in the SPEA, these declines in economic activity that have already occurred have skewed historical ranges relied upon in the SPEA to determine whether a particular socioeconomic impact is significant, thereby resulting in an understatement of the significance of impacts (including a failure to identify certain impacts as significant).

PROBLEMS WITH LARGE-AREA, SINGLE-COUNTY ROI ANALYSIS

The SPEA identifies a "significant" overall socioeconomic impact on Cochise County due to proposed maximum-threshold drawdowns at Fort Huachuca, but understates that impact in relation to the way impacts of other installations are measured because it uses all of Cochise County as the ROI. While counties are appropriate study areas (or building blocks thereof) for most regions of the United States, they are not well-suited for Southeast Arizona. Cochise County is 6,166 square miles in area and is geographically larger than the states of Connecticut and Rhode Island combined. While Fort Huachuca has a tremendous economic impact on the Sierra Vista area, it has little impact on areas such as Douglas, Willcox, Bowie, Dagoon, Elfrida, McNeal, Mescal, Naco, Pirtleville, Portal, San Simon, Sunsites, and other unincorporated areas within the county. This is due to geographical separation, limitations of transportation infrastructure, and the existence of other, independent industries in those areas (e.g., cross-border international commerce in Douglas—the county's second largest city; and agriculture in Willcox and the Sulphur Springs Valley region in eastern Cochise County). While Fort Huachuca no doubt has some tertiary impacts on those areas, it is no more than would be expected of the impacts of other Army installations on neighboring counties outside their SPEA-defined ROIs that are comparable distances away (e.g., occasional sightseeing visits or a relatively small number of long-distance commuters). Including those areas in the ROI, which account for about a third of the countywide population, considerably dilutes the true impact on the affected region. This is due to the use of inflated (countywide) population, employment, sales, and income numbers as denominators to calculate percent changes in those variables. The result is lower forecasted percent changes attributable to the proposed Army 2020 Force Structure Realignment. The problem is then exacerbated when comparisons are made to other installations with ROIs that are a fraction the geographical size of Cochise County, such as the comparisons shown in Table FNSI-4 of the SPEA.

The problem with using large, single-county ROIs is evident when comparing installations with baseline permanent party soldier and Army civilian populations similar in size to Fort Huachuca (see Table 1). The problem is addressed specifically in the SPEA, which notes with regard to Fort Lee, VA, that since “the economic model...cannot analyze data for partial counties or independent cities, all of Chesterfield County is included in this analysis.” Interestingly, that same constraint and threat to the validity of the model is not independently discussed in the socioeconomic impact sections for Fort Irwin, CA or Fort Huachuca, AZ—two installations that are likely most impacted by this modeling limitation due to their locations in geographically large counties (much more so than Chesterfield County, VA, which was addressed in the SPEA and is only 423 square miles—or about 1/15th the size of Cochise County). Fort Irwin, for example, is located in San Bernardino County, CA, which is more than 20,000 square miles. Fort Irwin likely has little economic connection to sales, income, employment, and population in the City of San Bernardino, for example, which is located approximately 100 miles and a 90-minute drive away. Similarly, there is little economic impact (of the types measured by EIFS) of Fort Huachuca on the Cochise County cities of Douglas and Willcox, for example, which are between 60 and 70 miles and more than an hour drive away (what impacts exist are, in all likelihood, no more than what the other Army installations analyzed in the SPEA would have on neighboring counties well outside their SPEA-defined ROIs that are comparable distances away).

Table 1 illustrates the problem. As shown in Table 1, the SPEA assigns an ROI of only 463 square miles to Fort Leavenworth, KS while assigning an area more than 13 times that size to Fort Huachuca and more than 43 times that size to Fort Irwin, CA. There is no rational justification to assume Army soldiers, civilians, and their families assigned to Fort Irwin will generally live, work, and shop in an area that is more than 20,000 square miles, or those assigned to Fort Huachuca will live, work, and shop in an area that is 6,166 square miles, while those stationed at Fort Leavenworth will confine themselves to only 463 square miles. Rational ROIs would be more or less uniform in geographical size and reflective of typical drive/commuting times and distances. If the SPEA were to assign an ROI of contiguous counties to Fort Leavenworth that is similar in geographical size to Cochise County, instead of including just Leavenworth County (as in the SPEA) it would include Leavenworth County, Wyandotte County, Johnson County, Douglas County, Jefferson County, Atchison County, Miami County, Franklin County, Doniphan County, Osage County, Shawnee County, Jackson County, and the southern half of Brown County. The forecasted declines in sales, income, jobs, and population attributable to the Army 2020 Force Structure Realignment would then be divided by the total combined sales, income, jobs, and population of those 12 counties (and half of Brown County). If that analysis were carried out, the impacts on sales, income, jobs, and population for Fort Leavenworth would, in all likelihood, show as “less than significant” for the 6,200 square mile area of northeastern Kansas because denominators used to calculate percent changes would be greatly increased (resulting in smaller percent changes) while any increase in economic multipliers would be negligible (instead, the SPEA shows all of the impacts as “significant” for Fort Leavenworth based on the limited 463 square mile region of Leavenworth County selected as the ROI). There is no rational basis to conclude soldiers, civilians, and their families assigned to Fort Huachuca would drive an hour or two or more to work, but the same would not hold true for those assigned to Fort Leavenworth. This is supported by data from the U.S. Census Bureau’s 2008-2012 American Community Survey, which show the average commute time for Cochise County workers is 19.1 minutes,

while for Leavenworth County it is 22.4 minutes. The contrast between the Fort Leavenworth and Fort Huachuca analyses is but one example of a systematic problem, within the SPEA, of making comparisons (such as that in Table FNSI-4 of the SPEA) of installations based on vastly different land areas of ROIs, which are primary determinants of whether impacts are deemed significant or less than significant. The result is that the assumption errors of the model (specifically, errors in defining, in a uniform manner, the geographic areas that are impacted) dictate the SPEA research results regarding whether declines in sales, income, employment, and population are significant.

TABLE 1: COMPARISON OF LAND AREA OF SPEA ROIs

<i>Installation Name</i>	<i>Baseline Permanent Party Soldier and Army Civilian Population</i>	<i>SPEA Impact Study Area/Region of Influence (ROI)</i>	<i>ROI Area (Square Miles)</i>
Fort Irwin, CA	5,539	San Bernardino County, CA	20,057
Fort Huachuca, AZ	5,841	Cochise County, AZ	6,166
Fort Jackson, SC	5,735	Calhoun, Fairfield, Kershaw, Lee, Lexington, Richland, and Sumter counties in South Carolina	4,325
Fort Rucker, AL	4,957	Coffee, Dale, and Houston counties in Alabama	1,820
Fort Meade, MD	6,638	Anne Arundel, Baltimore, Howard, and Prince George's counties in Maryland	1,747
Fort Lee, VA	6,474	Chesterfield, Dinwiddie, and Prince George counties, and the independent cities of Colonial Heights, Hopewell, and Petersburg in Virginia	1,233
Fort Leavenworth, KS	5,004	Leavenworth County, KS	463

Note. Includes installations evaluated in the SPEA with baseline permanent party soldier and Army civilian populations equal to that of Fort Huachuca (+/- 15%). Source: U.S. Census Bureau, US Army Environmental Command, Cochise College Center for Economic Research

Because the SPEA uses ROI-level totals (for income, sales, population, and employment) as denominators to determine percent changes of forecasted impacts attributable to the proposed Army 2020 Force Structure Realignment, installations assigned geographically larger ROIs will inherently show smaller percent changes; therefore, those changes are less likely to be deemed “significant,” other things equal. EIFS is suitable for measuring economic impacts of installations in isolation because the user of the output understands the geographic area/ROI considered and can factor that into interpretation of the output. However, when using the model to compare impacts among various installations, as in the SPEA, it is much less appropriate unless the researcher adjusts the ROIs so they are similar in geographic size. Arbitrary political boundaries such as county lines (when different states draw those lines very differently) do not meet the test of uniformity necessary for comparison, especially when the areas included within the boundaries sometimes vary greatly from installation to installation. Using the entire 6,166 square-mile area of Cochise County as the ROI for Fort Huachuca understates the percent change in sales, income, employment, and population, compared to the way those are measured for other installations assessed in the SPEA. That is because the larger countywide sales, income, labor force, and population figures are used as denominators in calculating the percent changes. cursory analysis by the Cochise College Center for Economic Research indicates the impact on

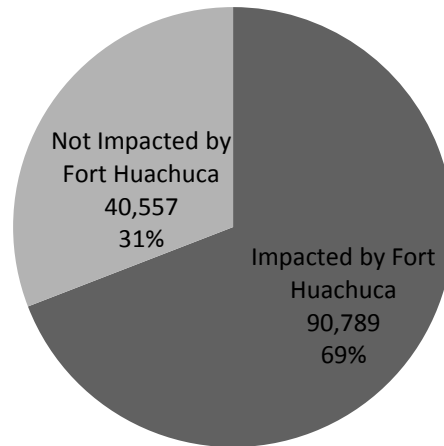
income would likely be significant under the SPEA model if the appropriate ROI was selected (the SPEA indicates it would be “less than significant” due to the use of the countywide data as the denominator). The appropriate ROI would be one that is uniform with that of other installations in the way it measures the area in which soldiers, civilians, and their families live, work, and shop. See Table 2, Chart 1, and the map on page 8 for analysis by the Cochise College Center for Economic Research of the areas impacted by Fort Huachuca, based on: geographical distance, transportation infrastructure, reliance on other economic base industries, and uniformity with how ROIs for other installations are defined in the SPEA.

TABLE 2: IMPACT OF FORT HUACHUCA ON COCHISE COUNTY COMMUNITIES

<i>Areas Impacted by Fort Huachuca</i>	<i>Census 2010 Population</i>	<i>Distance (miles) from Ft. Huachuca</i>	<i>Primary Base Industries</i>
Benson	5,105	34	Agriculture, Interstate Commerce, Energy
Bisbee	5,575	30	Tourism
Huachuca City	1,853	7	None
Sierra Vista	43,888	0	Defense
Tombstone	1,380	24	Tourism
Sierra Vista Southeast (Hereford)	14,797	11	None
Miracle Valley	644	22	Agriculture
Palominas	212	24	Agriculture
St. David	1,699	41	Agriculture, Manufacturing
Whetstone	2,617	13	None
Other Unincorporated Areas*	13,019		
TOTAL	90,789		
<i>Areas <u>Not</u> Impacted by Fort Huachuca</i>	<i>Census 2010 Population</i>	<i>Distance (miles) from Ft. Huachuca</i>	<i>Primary Base Industries</i>
Douglas	17,378	56	International Commerce, Border Protection
Willcox	3,757	70	Agriculture, Border Protection
Bowie	449	93	Agriculture
Dragoon	209	52	Agriculture
Elfrida	459	58	Agriculture
McNeal	238	52	Agriculture
Mescal	1,812	38	Agriculture
Naco	1,046	37	International Commerce, Border Protection
Pirtleville	1,744	55	None
San Simon	165	109	Agriculture
Sunizona	281	78	Agriculture
Other Unincorporated Areas*	13,019		
TOTAL	40,557		

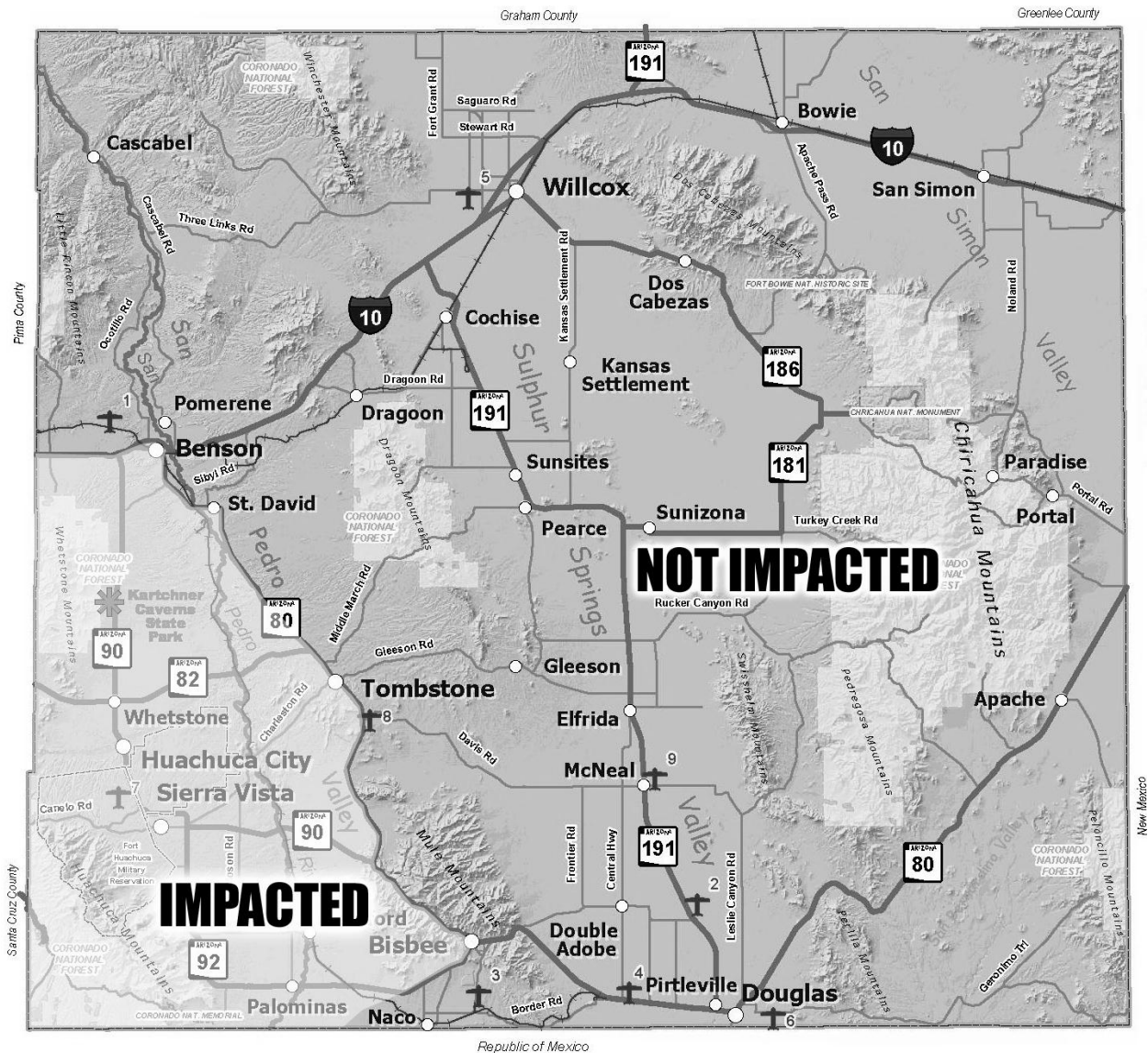
* Population not accounted for by incorporated places and census designated places is divided equally among impacted/not impacted; however, the larger share is likely *not impacted* due to the larger land area and greater likelihood of settlements not being recognized as CDPs (e.g., Pearce, Sunsites, Portal, Kansas Settlement, Cochise, Double Adobe, etc.—see map on page 8). Source: U.S. Census Bureau and Cochise College Center for Economic Research

CHART 1: TOTAL POPULATION OF COCHISE COUNTY COMMUNITIES IMPACTED/NOT IMPACTED BY FORT HUACHUCA



AN IMPORTANT NOTE REGARDING ECONOMIC MULTIPLIERS: The reason most input-output economic impact models (including EIFS) use county-level (or contiguous county) study regions is that counties are the lowest levels for which the U.S. Department of Commerce publishes data necessary to construct economic multipliers used in the analysis. In the case of Fort Huachuca and Cochise County, the suggestion of a smaller, more accurate, sub-county ROI should not be construed as suggesting economic multipliers should also be adjusted. The primary determinant of whether an area is impacted by indirect and induced spending is the existence of the affected industries within that area. If the impacted industry is present, it is assumed the local industry will provide the local output demanded by the level of spending analyzed. All aggregate industries necessary to construct countywide multipliers for Cochise County are present within the combined areas that make up the more accurate sub-county ROI for Fort Huachuca, as outlined in this paper, according to U.S. Census Bureau ZIP Code Business Patterns (see the Cochise College Center for Economic Research's 2013 *Sierra Vista, Benson, and Bisbee Economic Outlook* publications at www.cochise.edu/cer, or source data at www.census.gov). For that reason, any decrease in the multipliers resulting from a narrower ROI to reflect only those areas in which Fort Huachuca soldiers, civilians, and their families generally live, work, and shop, would be negligible. Thus, the EIFS forecasts of indirect and induced impacts on sales, income, employment, and population produced for the county-level ROI should be considered appropriate, without modification, for the narrower sub-county ROI suggested in this paper. Put another way, the SPEA numerators for determining percent changes should remain the same and only the denominators should be changed to account for the narrower, more accurate sub-county ROI.

MAP: COCHISE COUNTY, ARIZONA



PROBLEMS WITH HISTORICAL-RANGE ANALYSIS

The SPEA analysis finds that the impact on sales and income from proposed maximum reductions at Fort Huachuca would be “less than significant” because forecasted declines are within historical ranges (or less than the economic contraction significance values). However, declining activity at Fort Huachuca in recent years has decidedly skewed downward the lower limit of the historical range data (just as previous war-related build-ups skewed the upward range). Declining activity related to the fort includes: (1) a reduction in defense contracting activities and the loss of contracting jobs, (2) a decline in temporary duty travel to the fort for training and conferences, (3) a drop in the fort’s average daily student load, and (4) changes in Army lodging policies that have distressed the area’s off-post accommodation industry. These occurrences create the illusion of acceptable/normal historical

downward swings in area sales and income (along with employment and population) but these in fact have been caused by declining activity and policy changes that have already occurred at Fort Huachuca in recent years. For example, accommodation sales (hotel, motel, and other temporary lodging stays) in Sierra Vista—a major source of the city’s taxable sales—fell 50% from 2010 to 2013 (see Table 3). This drop was due almost exclusively to a decline in temporary duty travel to Fort Huachuca and changes in Army lodging policies that now require active duty military personnel to be billeted on post if space is available. Once Fort Huachuca completes implementation of the Privatized Army Lodging initiative, there will be an additional 116 rooms available on post (in 2013, construction began on a new 243-room Candlewood Suites hotel on the fort; the fort will also see remodeling of its previous lodging facilities to be branded as Holiday Inn Express with a total of 160 rooms—once both facilities are complete, there will be 403 rooms available on post, compared to 287 before the initiative). Table 3 illustrates the problem of SPEA historical range analysis by showing one example of the extent to which the historical trends have been influenced by downsizing activity that has already occurred at Fort Huachuca.

The measurement problem is exacerbated by the use of the entire 6,166 square-mile area of Cochise County as the ROI (discussed earlier), which understates forecasted impacts in terms of percent change. As Table 3 shows, although accommodation sales in Sierra Vista were down 50% between 2010 and 2013 (-\$12,590,472 / \$25,337,345) the decline was only 28% when measured using the countywide ROI (-\$12,590,472 / \$45,357,394). This illustrates the *understated* forecasted percent declines attributable to the proposed Army 2020 Force Structure Realignment (due to the use of countywide denominators, as discussed earlier) and the *overstated* historical downward fluctuations/range (due to changes that have already occurred at Fort Huachuca). The upshot is a failure to identify sales and income impacts as significant, and understating the significance of employment and population impacts (the latter is of less importance in the SPEA analysis due to the binary classification [significant/less than significant]).

TABLE 3: ACCOMMODATION SALES

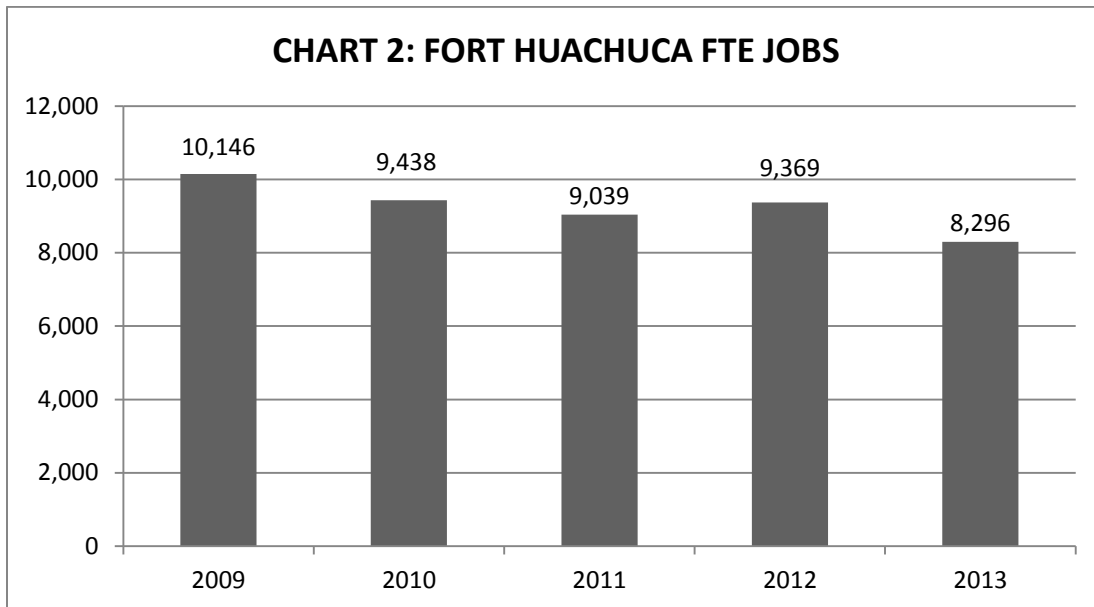
Year	Cochise County	% Change	Sierra Vista	% Change
2009	\$41,243,050	-9.3%	\$22,499,564	-2.4%
2010	\$45,357,394	10.0%	\$25,337,345	12.6%
2011	\$40,863,664	-9.9%	\$23,581,436	-6.9%
2012	\$34,680,677	-15.1%	\$17,425,818	-26.1%
2013	\$30,956,346	-10.7%	\$12,746,873	-26.9%

Source: Arizona Department of Revenue and Cochise College Center for Economic Research

Active Duty Military and Civil Servant Jobs Already Lost

The Army 2020 Force Structure Realignment proposes a maximum reduction of 2,739 positions at Fort Huachuca; however, this is in addition to 1,850 jobs that have already been lost since 2009 (see Chart 2).

In its participation in the Cochise College Center for Economic Research's annual *Top 75 Employer Survey*, Fort Huachuca reported 10,146 fulltime equivalent (FTE) jobs in 2009. By 2013, this number had dropped to 8,296. The 2014 *Top 75 Employer Survey* was ongoing at the time this paper was prepared and further losses are anticipated to be revealed by that survey. Those job losses have, in all likelihood, skewed historical ranges for employment, population, income, and sales relied upon in the SPEA analysis to determine whether impacts are significant, overstating the ranges and resulting in a failure to identify impacts as significant (due to the wider ranges, including lower negative ranges).



Note. Includes permanently assigned active duty military personnel, civil servants and non-appropriated fund workers, and average daily student load. Source: Fort Huachuca Public Affairs Office and Cochise College Center for Economic Research.

Defense Contracting Job Losses

The number of jobs directly associated with Fort Huachuca that have already been lost is even higher when considering defense contractor jobs, which the fort does not report in the *Top 75 Employer Survey* (the fort reports only permanently assigned active duty personnel, civil servants/non-appropriated fund workers employed directly by the fort, and average daily student load). Of the eight defense contractors on the 2013 *Top 75* employer list, every one shed jobs from the previous year (see Table 4). Combined, 463 jobs were lost from 2012 to 2013 from those eight employers alone. That reflects only one year and includes only the eight largest defense contractors—the decline in the defense contracting industry began several years prior and resulted in the closure of several smaller contracting firms (analysis of the longer-term declines is beyond the scope of this paper due to the complexities of a constantly restructuring defense contracting industry and time constraints of the SPEA public comment period, for which this paper was prepared). The loss of defense contracting jobs associated with Fort Huachuca has skewed historical ranges for employment, population, income, and sales relied upon in the SPEA analysis to determine whether impacts are significant, overstating those ranges and resulting in a failure to identify impacts as significant (due to the wider historical ranges, including lower negative ranges).

TABLE 4: DEFENSE CONTRACTING EMPLOYMENT (2012—2013)

<i>Employer</i>	<i>FTE Jobs (2013)</i>	<i>FTE Jobs (2012)</i>	<i>Change</i>	<i>Change (%)</i>
General Dynamics	698	855	-157	-18.4%
ManTech International	422	560	-138	-24.6%
TASC	192	293	-101	-34.5%
Raytheon	287	315	-28	-8.9%
Northrop Grumman	450	460	-10	-2.2%
NCI Information Systems	260	269	-9	-3.3%
SAIC	295	300	-5	-1.7%
Engility	136	151	-15	-9.9%
<i>Total</i>	<i>2,740</i>	<i>3,203</i>	<i>-463</i>	<i>-14.5%</i>

Note. Includes all defense contractor employers that participated in the *Cochise County Top 75 Employer Survey* in 2012 and 2013 with at least 30 FTE employees in 2013. Source: Cochise College Center for Economic Research.

Combined Defense-Related Job Losses (2012—2013)

Considering permanently assigned active duty military personnel, civil servants, non-appropriated fund workers, and average daily student load, combined with jobs in the area's eight largest defense contracting firms, defense-related jobs in the Sierra Vista area were down by 1,536 (-12.2%) from 2012 to 2013 (see Table 5) with further declines anticipated to be revealed in the 2014 Top Employer survey, which was underway at the time this paper was prepared. Moreover, declines have been ongoing for several years, but time constraints due to the public comment period for the SPEA, for which this paper was prepared, preclude in-depth analysis at this time. cursory analysis, however, suggests the number of jobs associated with Fort Huachuca (active-duty military, students, civil servants, non-appropriated fund workers, and defense contractors) that have already been lost since 2009 is likely between 2,500 and 3,500 based on numbers reported by the fort and trends in defense contracting. Those losses have in all likelihood skewed historical ranges for employment, population, income, and sales relied upon in the SPEA analysis to determine whether impacts are significant, overstating the ranges and resulting in a failure to identify impacts as significant (due to wider ranges, including lower negative ranges).

TABLE 5: COMBINED DEFENSE-RELATED EMPLOYMENT (2012—2013)

<i>Employer</i>	<i>FTE Jobs (2013)</i>	<i>FTE Jobs (2012)</i>	<i>Change</i>	<i>Change (%)</i>
Fort Huachuca*	8,296	9,369	-1,073	-11.5%
Eight Largest Defense Contractors**	2,740	3,203	-463	-14.5%
<i>Total</i>	<i>11,036</i>	<i>12,572</i>	<i>-1,536</i>	<i>-12.2%</i>

* Includes only permanently assigned active duty military personnel, civil servants/non-appropriated fund workers employed directly by the fort, and average daily student load. **Includes all defense contractor employers that participated in the *Cochise County Top 75 Employer Survey* in both 2012 and 2013 with at least 30 FTE employees in 2013. Source: Cochise College Center for Economic Research

Because the SPEA does not list the specific input figures used to calculate historical ranges, it is difficult to determine whether the sales impact would be significant, controlling for that factor alone. However, the degree to which downsizing at Fort Huachuca has, in recent years, led to considerable declines in local economic activity, along with understated forecasted percent changes resulting from the use of countywide sales as the denominator (discussed earlier), makes a strong case that the sales impact would also be significant if the SPEA were to control for both factors (ROI and skewed historical ranges).

RECOMMENDATIONS

To control for the assumption errors and associated threats to validity arising from the inappropriate use of the entire 6,166 square-mile area of Cochise County as the ROI in the SPEA analysis, along with exclusion of analysis of the impacts of (1) a reduction in defense contracting activities and the loss of contracting jobs associated with the fort that have already occurred, (2) a decline in temporary duty travel to the fort for training and conferences, (3) a 35% drop in the fort's average daily student load, (4) changes in Army lodging policies that have devastated the area's accommodation industry, and (5) other significant Fort Huachuca-related drawdowns that have already occurred—all of which impact the historical trend analysis and understate the significance of further downsizing—the following recommendations are made:

- The socioeconomic impacts of sales, income, employment, and population of the proposed downsizing of Fort Huachuca on the area's economy should all be deemed significant (rather than just employment and population). This would be the most likely outcome of correction of the assumption errors and is consistent with the linear relationships among those variables assumed by EIFS. This adjustment should be made based on the USAEC researcher's judgment of the validity of the points made in this paper alone, or in combination with supplemental analysis outside the EIFS model to quantify and adjust for assumption errors (one approach would be to downwardly adjust ROI sales and income denominators by 30%—the approximate share of countywide sales accounted for by areas not impacted by Fort Huachuca—and recalculate percent declines using the original EIFS numerators). Adjusting for downward historical swings (negative ranges) attributable directly to Fort Huachuca might pose a somewhat larger challenge; however, the Cochise College Center for Economic Research is available to assist in such analysis and is confident it can be accomplished with minimal effort.
- The ROIs of other installations assessed in the SPEA should be evaluated for uniformity. For most areas, contiguous counties should serve as building blocks in a manner that creates ROIs that are similar in geographical size (or for which deviations can be clearly explained by commuting times or land use analysis). In extreme cases, such as Fort Irwin and Fort Huachuca, county-level denominators used to calculate percent changes in sales, income, jobs, and population should be adjusted downward so they reasonably represent the geographical areas that are impacted, in a manner similar to that of other installations to which comparisons are made in the SPEA (e.g., Table FNSI-4). Put another way, designation of areas in which soldiers, civilians, and their families live, work, and shop should be uniform among installations assessed in the SPEA; in cases where installations are located within geographically vast counties that contain land areas where installation employees and their families do not generally live, work, and shop, adjustments should be made to facilitate fair, valid, and uniform comparisons.
- To the extent feasible, the analysis in this document, along with any further examination that addresses the assumption errors outlined herein, should be incorporated into a revised SPEA (to include updating Table FNSI-4, as well as narratives and tables in Chapter 4, Section 4.11.12).

For questions or comments, contact:

Robert Carreira, Ph.D.
(520) 515-5370
CarreiraR@cochise.edu



CENTER FOR ECONOMIC RESEARCH

901 North Colombo Avenue
Sierra Vista, Arizona 85635-2317
Tel. (520) 515-5486
Fax (520) 515-5343
Email: cer@cochise.edu