

APPENDIX B

SOCIOECONOMICS

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This appendix provides detailed supporting information for the socioeconomic analysis discussed in Section 4.4. Appendix B describes the methodology and assumptions used in the analysis, as well as the direct and indirect output, earnings, and employment impacts for each base's affected environment. Changes in regional population and attendant impacts to population-driven resources (such as housing and schools) were also assessed.

ECONOMIC IMPACT METHODOLOGY

An examination of economic effects requires a systematic analysis of the relationships among industries within regions because these relationships largely determine how regional economies are likely to respond to project changes. Regional input-output multipliers account for industry relationships within regions and are useful tools for estimating regional economic impacts.

The Regional Input-Output Modeling System (RIMS II) of the U.S. Bureau of Economic Analysis (BEA) was used for this analysis (U.S. Bureau of Economic Analysis 1997). RIMS II is widely used in both the public and private sectors and is based on an accounting framework called an input-output (I-O) table. For each industry, an I-O table shows the distribution of the inputs purchased and the outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's regional economic accounts, which are used to adjust the national I-O table to reflect a region's industrial structure and trading patterns.

Local procurement for goods and services, as well as local expenditures by employees, support additional, indirect output; earnings; and jobs. Multipliers for output, earnings, and employment measure the economic impact of a change in final demand, in earnings, or in employment on a region's economy. This analysis used specific RIMS II regional multipliers developed by BEA for each of the five bases' affected environment.

For this analysis, the following assumptions were made in order to determine the maximum effects of the proposed action on the local economy:

- All construction activities and full beddown staffing occur in one year.
- All expenditures and salaries are in year 2000 dollars.
- All economic activity occurs within the affected environments (i.e., all expenditures are local).
- Operations and maintenance expenditures equal producers' prices.

- The creation of Global Hawk employment positions results in in-migration of personnel.
- All military personnel live off base.
- All families of deployed personnel remain living in the base's affected environment.

1.0 BEALE AFB

1.1 Construction Impacts

Under this alternative, construction costs would be \$21.3 million. Construction activities would employ an average of 25 workers at any one time. The indirect impacts of facility construction are shown in Table B-1.

Table B-1. Estimated Construction Impacts - Beale AFB	
<i>Impact Based on the Change in Final Demand</i>	
Change in Final Demand	21,300,000
<i>Final-demand multipliers:</i>	
Output (dollars)	1.6974
Earnings (dollars)	0.4269
Employment ^a (jobs)	14.12
<i>Impact on:</i>	
Output	36,154,620
Earnings	9,092,970
Employment (jobs)	301
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. <i>Source:</i> U.S. Bureau of Economic Analysis 2000.	

No changes to population would occur from construction activities. The required construction force of approximately 25 workers would be expected to be available from the local labor supply. Indirect jobs associated with construction expenditures would be approximately 301. Most indirect job growth would occur in the services, wholesale, and retail trade industries. This growth would represent less than 1 percent of current employment in the affected environment. No in-migration would be expected as a result of indirect job growth. Increased earnings as a result of construction activities would represent less than 1 percent of current personal income. Increased output would be \$36.2 million. Construction activities would result in minor, short-term beneficial impacts to the local economy.

1.2 Operations Impacts

Under the proposed action, 119 officers, 753 enlisted, and 46 civilian and contractor personnel would be employed. Assuming average wage ranges for each group, salaries would total approximately \$22.6 million (Defense Finance and Accounting Service 2000, U.S. Office of Personnel Management 2000). It is assumed that these personnel would in-migrate to the area for employment. Based on an average accompanying dependent factor of 1.8 (USAF 1997), direct population change as a result of operations would be approximately 2,570 (918 employees plus 1,652 dependents). This change would represent less than 1 percent of population in the affected environment. No impacts would be expected to population-affected resources such as housing and schools.

Annual operations and maintenance costs would be approximately \$47.2 million. Indirect impacts associated with operations are shown in Table B-2.

Table B-2. Estimated Operations Impacts - Beale AFB							
<i>Industry</i>	<i>Regional Purchases (dollars)</i>	<i>Final-Demand Multiplier</i>			<i>Impact</i>		
		<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment^a (jobs)</i>	<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment (jobs)</i>
Transportation	4,720,000	1.5438	0.3734	11.9	7,286,736	1,762,448	56
Utilities	4,720,000	1.5177	0.1704	3.8	7,163,544	804,288	18
Wholesale Trade	14,160,000	1.4683	0.3328	9.4	20,791,128	4,712,448	133
Insurance	2,360,000	1.8431	0.485	13.7	4,349,716	1,144,600	32
Business Services	16,520,000	1.6172	0.498	15.3	26,716,144	8,226,960	253
Health Services	4,720,000	1.6891	0.5875	16.9	7,972,552	2,773,000	80
Households	22,600,000	0.8786	0.2073	8.1	19,856,360	4,684,980	183
<i>Sub total</i>	68,100,000				94,136,180	24,108,724	755
Initial Change					47,200,000	22,600,000	918
<i>Total</i>					141,336,180	46,708,724	1,673
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. Source: U.S. Bureau of Economic Analysis 2000.							

Indirect jobs created as a result of operations would be 755. Most indirect job growth would occur in the services, wholesale, and retail trade industries. Indirect job growth would represent less than 1 percent of employment in the affected environment. The local labor pool would be expected to absorb this additional demand; no significant change in the unemployment rate and no in-migration of labor would be expected.

Operations would result in an increase of \$94.1 million in output. Increased earnings as a result of operations would represent less than 1 percent of personal income. Global Hawk operations would result in minor beneficial impacts to the local economy.

2.0 EDWARDS AFB

Since the smallest economic region for which the RIMS II regional multipliers can be developed is the county, the affected environment for Edwards AFB for this RIMS II analysis includes Kern, Los Angeles, and San Bernardino counties in California.

2.1 Construction Impacts

Under this alternative, construction costs would be \$16.5 million. Construction activities would employ an average of 16 workers at any one time. The indirect impacts of facility construction are shown in Table B-3.

Table B-3. Estimated Construction Impacts - Edwards AFB	
<i>Impact Based on the Change in Final Demand</i>	
Change in Final Demand	16,500,000
<i>Final-demand multipliers:</i>	
Output (dollars)	2.1568
Earnings (dollars)	0.6083
Employment ^a (jobs)	19.8
<i>Impact on:</i>	
Output	35,587,200
Earnings	10,036,950
Employment (jobs)	327
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. <i>Source:</i> U.S. Bureau of Economic Analysis 2000.	

No changes to population would occur from construction activities. The required construction force of approximately 16 workers would be expected to be available from the local labor supply. Indirect jobs associated with construction expenditures would be approximately 327. Most indirect job growth would occur in the services, wholesale, and retail trade industries. This growth would represent less than 1 percent of current employment in the affected environment. No in-migration would be expected as a result of indirect job growth. Increased earnings as a result of construction activities would represent less than 1 percent of current personal income. Increased output would be \$35.6 million. Construction activities would result in minor, short-term beneficial impacts to the local economy.

2.2 Operations Impacts

Under the proposed action, 119 officers, 753 enlisted, and 46 civilian and contractor personnel would be employed. Assuming average wage ranges for each group, salaries would total approximately \$22.6 million (Defense Finance and Accounting Service 2000, U.S. Office of Personnel Management 2000). It is assumed that these personnel would in-migrate to the area for employment. Based on an average accompanying dependent factor of 1.8 (USAF 1997), direct population change as a result of operations would be approximately 2,570 (918 employees plus 1,652 dependents). This change would represent less than 1 percent of population in the affected environment. No impacts would be expected to population-affected resources such as housing and schools.

Annual operations and maintenance costs would be approximately \$47.2 million. Indirect impacts associated with operations are shown in Table B-4.

Table B-4. Estimated Operations Impacts - Edwards AFB							
		<i>Final-Demand Multiplier</i>			<i>Impact</i>		
<i>Industry</i>	<i>Regional Purchases (dollars)</i>	<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment^a (jobs)</i>	<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment (jobs)</i>
Transportation	4,720,000	2.1332	0.5635	17.8	10,068,704	2,659,720	84
Utilities	4,720,000	1.801	0.3076	7.3	8,500,720	1,451,872	34
Wholesale Trade	14,160,000	1.8827	0.5256	15.2	26,659,032	7,442,496	215
Insurance	2,360,000	2.5266	0.7562	22	5,962,776	1,784,632	52
Business Services	16,520,000	2.0763	0.7118	22.1	34,300,476	11,758,936	365
Health Services	4,720,000	2.1447	0.7686	22.6	10,122,984	3,627,792	107
Households	22,600,000	1.3276	0.349	12.7	30,003,760	7,887,400	287
<i>Sub total</i>					125,618,452	36,612,848	1,144
<i>Initial Change</i>					47,200,000	22,600,000	918
<i>Total</i>					172,818,452	59,212,848	2,062
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. Source: U.S. Bureau of Economic Analysis 2000.							

Indirect jobs created as a result of operations would be 1,144. Most indirect job growth would occur in the services, wholesale, and retail trade industries. Indirect job growth would represent 1 percent of employment in the affected environment. The local labor pool would be expected to absorb this additional demand; no significant change in the unemployment rate and no in-migration of labor would be expected.

Operations would result in an increase of \$125.6 million in output. Increased earnings as a result of operations would represent less than 1 percent of personal income. Global Hawk operations would result in minor beneficial impacts to the local economy.

3.0 ELLSWORTH AFB

3.1 Construction Impacts

Under this alternative, construction costs would be \$10 million. Construction activities would employ an average of 23 workers at any one time. The indirect impacts of facility construction are shown in Table B-5.

Table B-5. Estimated Construction Impacts - Ellsworth AFB	
<i>Impact Based on the Change in Final Demand</i>	
Change in Final Demand	10,000,000
<i>Final-demand multipliers:</i>	
Output (dollars)	1.8256
Earnings (dollars)	0.5714
Employment ^a (jobs)	26.5
<i>Impact on:</i>	
Output	18,256,000
Earnings	5,714,000
Employment (jobs)	265
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. Source: U.S. Bureau of Economic Analysis 2000.	

No changes to population would occur from construction activities. The required construction force of approximately 23 workers would be expected to be available from the local labor supply. Indirect jobs associated with construction expenditures would be approximately 265. Most indirect job growth would occur in the services, wholesale, and retail trade industries. This growth would represent less than 1 percent of current employment in the affected environment. No in-migration would be expected as a result of indirect job growth. Increased earnings as a result of construction activities would represent less than 1 percent of current personal income. Increased output would be \$18.3 million. Construction activities would result in minor, short-term beneficial impacts to the local economy.

3.2 Operations Impacts

Under the proposed action, 119 officers, 753 enlisted, and 46 civilian and contractor personnel would be employed. Assuming average wage ranges for each group, salaries would total approximately \$22.6 million (Defense Finance and Accounting Service 2000, U.S. Office of Personnel Management 2000). It is assumed that these personnel would in-migrate to the area for employment. Based on an average accompanying dependent factor of 1.8 (USAF 1997), direct population change as a result of operations would be

approximately 2,570 (918 employees plus 1,652 dependents). This change would represent approximately 2 percent of population in the affected environment. No impacts would be expected to population-affected resources such as housing and schools.

Annual operations and maintenance costs would be the same as under Option 1, approximately \$47.2 million. Indirect impacts associated with operations are shown in Table B-6.

Table B-6. Estimated Operations Impacts - Ellsworth AFB							
<i>Industry</i>	<i>Regional Purchases (dollars)</i>	<i>Final-Demand Multiplier</i>			<i>Impact</i>		
		<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment^a (jobs)</i>	<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment (jobs)</i>
Transportation	4,720,000	1.7357	0.5322	22.3	8,192,504	2,511,984	105
Utilities	4,720,000	1.5496	0.2715	9.6	7,314,112	1,281,480	45
Wholesale Trade	14,160,000	1.6059	0.4919	20	22,739,544	6,965,304	283
Insurance	2,360,000	1.9831	0.6996	31.6	4,680,116	1,651,056	75
Business Services	16,520,000	1.7219	0.6455	33.9	28,445,788	10,663,660	560
Health Services	4,720,000	1.7872	0.7153	29	8,435,584	3,376,216	137
Households	22,600,000	1.0212	0.2997	16.6	23,079,120	6,773,320	375
<i>Sub total</i>					102,886,768	33,222,920	1,580
Initial Change					47,200,000	22,600,000	918
<i>Total</i>					150,086,768	55,822,920	2,498
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. Source: U.S. Bureau of Economic Analysis 2000.							

Indirect jobs created as a result of operations would be 1,580. Most indirect job growth would occur in the services, wholesale, and retail trade industries. Indirect job growth would represent approximately 2 percent of employment in the affected environment. The local labor pool would be expected to absorb this additional demand; no significant change in the unemployment rate and no in-migration of labor would be expected.

Operations would result in an increase of \$102.9 million in output. Increased earnings as a result of operations would represent approximately 1 percent of personal income. Global Hawk operations would result in minor beneficial impacts to the local economy.

4.0 TINKER AFB

4.1 Construction Impacts

Under this alternative, construction costs would be \$32 million. Construction activities would employ an average of 43 workers at any one time. The indirect impacts of facility construction are shown in Table B-7.

Table B-7. Estimated Construction Impacts - Tinker AFB	
<i>Impact Based on the Change in Final Demand</i>	
Change in Final Demand	32,000,000
<i>Final-demand multipliers:</i>	
Output (dollars)	2.0769
Earnings (dollars)	0.6632
Employment ^a (jobs)	29.1
<i>Impact on:</i>	
Output	66,460,800
Earnings	21,222,400
Employment (jobs)	931
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. Source: U.S. Bureau of Economic Analysis 2000.	

No changes to population would occur from construction activities. The required construction force of approximately 43 workers would be expected to be available from the local labor supply. Indirect jobs associated with construction expenditures would be approximately 931. Most indirect job growth would occur in the services, wholesale, and retail trade industries. This growth would represent less than 1 percent of current employment in the affected environment. No in-migration would be expected as a result of indirect job growth. Increased earnings as a result of construction activities would represent less than 1 percent of current personal income. Increased output would be \$66.5 million. Construction activities would result in minor, short-term beneficial impacts to the local economy.

4.2 Operations Impacts

Under the proposed action, 119 officers, 753 enlisted, and 46 civilian and contractor personnel would be employed. Assuming average wage ranges for each group, salaries would total approximately \$22.6 million (Defense Finance and Accounting Service 2000, U.S. Office of Personnel Management 2000). It is assumed that these personnel would in-migrate to the area for employment. Based on an average accompanying dependent factor of 1.8 (USAF 1997), direct population change as a result of operations would be approximately 2,570 (918 employees plus 1,652 dependents). This change would

represent less than 1 percent of population in the affected environment. No impacts would be expected to population-affected resources such as housing and schools.

Annual operations and maintenance costs would be approximately \$47.2 million. Indirect impacts associated with operations are shown in Table B-8.

Table B-8. Estimated Operations Impacts - Tinker AFB							
		<i>Final-Demand Multiplier</i>			<i>Impact</i>		
<i>Industry</i>	<i>Regional Purchases (dollars)</i>	<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment^a (jobs)</i>	<i>Output (dollars)</i>	<i>Earnings (dollars)</i>	<i>Employment (jobs)</i>
Transportation	4,720,000	2.017	0.6073	24	9,520,240	2,866,456	113
Utilities	4,720,000	2.0001	0.3434	11.3	9,440,472	1,620,848	53
Wholesale Trade	14,160,000	1.8402	0.5668	22.7	26,057,232	8,025,888	321
Insurance	2,360,000	2.5366	0.8245	35	5,986,376	1,945,820	83
Business Services	16,520,000	1.9979	0.7441	35.4	33,005,308	12,292,532	585
Health Services	4,720,000	2.0916	0.7992	33	9,872,352	3,772,224	156
Households	22,600,000	1.295	0.3672	18.9	29,323,500	8,298,720	427
<i>Sub total</i>					123,205,480	38,822,488	1,738
Initial Change					47,200,000	22,600,000	918
<i>Total</i>					170,405,480	61,422,488	2,656
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. Source: U.S. Bureau of Economic Analysis 2000.							

Indirect jobs created as a result of operations would be 1,738. Most indirect job growth would occur in the services, wholesale, and retail trade industries. Indirect job growth would represent less than 1 percent of employment in the affected environment. The local labor pool would be expected to absorb this additional demand; no significant change in the unemployment rate and no in-migration of labor would be expected.

Operations would result in an increase of \$123.2 million in output. Increased earnings as a result of operations would represent less than 1 percent of personal income. Global Hawk operations would result in minor beneficial impacts to the local economy.

5.0 WRIGHT-PATTERSON AFB

5.1 Construction Impacts

Under this alternative, construction costs would be \$19 million. Construction activities would employ an average of 18 workers at any one time. The indirect impacts of facility construction are shown in Table B-9.

No changes to population would occur from construction activities. The required construction force of approximately 18 workers would be expected to be available from the local labor supply. Indirect jobs associated with construction expenditures would be approximately 391.

Table B-10. Estimated Construction Impacts - Wright-Patterson AFB	
<i>Impact Based on the Change in Final Demand</i>	
Change in Final Demand	19,000,000
<i>Final-demand multipliers:</i>	
Output (dollars)	1.8439
Earnings (dollars)	0.5258
Employment ^a (jobs)	20.6
<i>Impact on:</i>	
Output	35,034,100
Earnings	9,990,200
Employment (jobs)	391
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. Source: U.S. Bureau of Economic Analysis 2000.	

Most indirect job growth would occur in the services, wholesale, and retail trade industries. This growth would represent less than 1 percent of current employment in the affected environment. No in-migration would be expected as a result of indirect job growth. Increased earnings as a result of construction activities would represent less than 1 percent of current personal income. Increased output would be \$35 million. Construction activities would result in minor, short-term beneficial impacts to the local economy.

5.2 Operations Impacts

Under the proposed action, 119 officers, 753 enlisted, and 46 civilian and contractor personnel would be employed. Assuming average wage ranges for each group, salaries would total approximately \$22.6 million (Defense Finance and Accounting Service 2000, U.S. Office of Personnel Management 2000). It is assumed that these personnel would in-migrate to the area for employment. Based on an average accompanying dependent factor of 1.8 (USAF 1997), direct population change as a result of operations would be approximately 2,570 (918 employees plus 1,652 dependents). This change would represent less than 1 percent of population in the affected environment. No impacts would be expected to population-affected resources such as housing and schools.

Annual operations and maintenance costs would be approximately \$47.2 million. Indirect impacts associated with operations are shown in Table B-10.

Indirect jobs created as a result of operations would be 1,186. Most indirect job growth would occur in the services, wholesale, and retail trade industries. Indirect job growth would represent less than 1 percent of employment in the affected environment. The local labor pool would be expected to absorb this additional demand; no significant change in the unemployment rate and no in-migration of labor would be expected.

Table B-10. Estimated Operations Impacts - Wright-Patterson AFB

Industry	Regional Purchases (dollars)	Final-Demand Multiplier			Impact		
		Output (dollars)	Earnings (dollars)	Employment ^a (jobs)	Output (dollars)	Earnings (dollars)	Employment (jobs)
Transportation	4,720,000	1.7705	0.4979	18.3	8,356,760	2,350,088	86
Utilities	4,720,000	1.4666	0.2711	8.1	6,922,352	1,279,592	38
Wholesale Trade	14,160,000	1.5871	0.4353	14.2	22,473,336	6,163,848	201
Insurance	2,360,000	1.8174	0.5683	19.8	4,289,064	1,341,188	47
Business Services	16,520,000	1.7445	0.6236	25.3	28,819,140	10,301,872	418
Health Services	4,720,000	1.7877	0.6888	24.9	8,437,944	3,251,136	118
Households	22,600,000	0.9522	0.2610	12.3	21,519,720	5,898,600	278
Sub total					100,818,316	30,586,324	1,186
Initial Change					47,200,000	22,600,000	918
Total					148,018,316	53,186,324	2,104
^a The employment multiplier is measured on the basis of a \$1 million change in output delivered to final demand. Source: U.S. Bureau of Economic Analysis 2000.							

Operations would result in an increase of \$100.8 million in output. Increased earnings as a result of operations would represent less than 1 percent of personal income. Global Hawk operations would result in minor beneficial impacts to the local economy.

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