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Relocation of Brooksville Regional Hospital

An Analysis Performed by

CENTER FOR ECONOMIC DEVELOPMENT RESEARCH
College of Business Administration



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September, 2001

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Preface

Brooksville Regional Hospital is one of two acute care facilities operated by Health Management Associates, Inc. in Hernando County, Florida. Located near the western city limits in the City of Brooksville, the hospital serves residents and visitors to Hernando County, Florida. A recent concept to relocate the facility to a new campus west of its current location has prompted this analysis. The analysis and report was commissioned by Health Management Associates, Inc. and performed by the Center for Economic Development Research, College of Business Administration, University of South Florida. The purpose of the report is to present demographic information relating to the hospital service area and to provide an analysis of the potential economic contribution of new hospital construction investment to Hernando County. The Center for Economic Development Research provides information and conducts research on issues related to economic growth and development in the Nation, in the state of Florida, and particularly in the central Florida region. The Center serves the faculty, staff, and students of the College of Business Administration, the University, and individuals and organizations in the University's service area. Activities of the Center for Economic Development Research are designed to further the objectives of the University and specifically the objectives of the College of Business Administration.

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Executive Summary

The purpose of this report is twofold:

1. To provide an analysis of the demographics of the hospital service area, including use of Geographical Information System techniques to visually represent data;
2. To analyze the economic contribution of potential construction and other capital investment expenditures, based on moving the hospital to a new campus. Specifically, we quantify the economic contribution to Hernando County of the major capital investment expenditures conceived for the hospital relocation. Due to the circulation of funds within the area of interest, the impact of the spending activity associated with the organization is a multiple of the initial, or first, round of spending. Employment, labor income, and output are the measures of economic contribution. The data used to estimate the economic contribution are from projected construction and investment costs in year 2000 dollars. Major capital investment is considered a one-time expenditure.

DEMOGRAPHIC ANALYSIS

The location of the proposed new hospital site is approximately 3 miles west of the existing Brooksville Regional Hospital facility. Concerns have been raised about travel time and distance to the proposed site in emergency situations. To analyze the effect to residents of Hernando County of the proposed hospital relocation, two demographic analyses have been performed.

If the hospital moves to a new site west of the existing location, the distance midpoint between Brooksville Regional Hospital and the closest hospital to the east, Dade City Hospital, will shift. Using ArcView GIS measurement techniques, it was determined that a 15 square-mile wedge in southeast Hernando County will effectively be farther from the new site than the existing site. The population within this wedge, based on Census 2000 data, is **1,265 Hernando County residents who would be farther from the proposed location than the existing location.**

The proposed hospital relocation will affect other Hernando County residents. Population figures were analyzed within a 3-mile radius of each of the Brooksville Regional Hospital sites (existing and proposed) and the closest hospital to the west, Oak Hill Hospital. Again, using ArcView GIS measurement techniques, together with CACI Demographic Data and Census 2000 Information, the net number of residents affected by the shift has been determined. **Westward relocation of the hospital by approximately 3 miles would provide closer access to Brooksville Regional Hospital for a net population of 5,428 Hernando County residents within a 3-mile radius of the new location.**

The demographic analyses are presented in Section I herein.

ECONOMIC EFFECT OF POTENTIAL RELOCATION EXPENDITURES

Economic contributions of potential site relocation expenditures are reported in terms of output, employment, and labor income. Relocation of the hospital to a new site will require major construction expenditures, estimated at \$30 million for the hospital and another \$3 million for a medical office complex. Capital investment for furnishings and equipment are estimated at \$2 million for furnishings and \$5 million for equipment. Timing of these expenditures has been presumed to occur in the years 2002, 2003, and 2004.

Over the 3-year period of construction, \$17.068 million of the \$40 million in direct expenditures will be spent in Hernando County. Due to the multiplier effect, a total of \$26.391 million in increased output will occur in Hernando County. Therefore, **the economic impact on Hernando County of the proposed construction is \$26.391 million between 2002 and 2004.**

During the construction phase, **employment in Hernando County is estimated to temporarily increase by 79 jobs in 2002, 149 jobs in 2003, and 67 jobs in 2004.**

Also, due to the proposed expenditures, **an aggregate increase of \$7 million in income is estimated to occur in Hernando County between 2002 and 2004.**

Analysis of the economic contribution of potential site relocation investment is included in Section II. Results of the analysis are reported at the 1-digit SIC level.

I. Demographic Analysis of Hospital Service Areas.

ASSUMPTIONS:

1. Current hospital location is 55 Ponce De Leon Boulevard, Brooksville, FL 34601
2. Proposed hospital location is 17166 Cortez Boulevard, Brooksville, FL 34601
3. Closest hospital to the east and south of the current location is the Dade City Hospital, located at 13100 Fort King Road, Dade City, FL 33525
4. Closest hospital to the west of proposed location is the Oak Hill Hospital, located at 11375 Cortez Boulevard, Brooksville, FL 34613
5. When emergency care is needed, residents are taken to the closest hospital.

Two analyses were completed to estimate the impact of the proposed relocation on residents of Hernando County. The first analysis examined the demographic changes resulting from a shift in the distance midpoint line between (1) the current Brooksville Regional Hospital and the Dade City Hospital; and (2) the proposed Brooksville Hospital and the Dade City Hospital. The second analysis examined the demographics of three mile rings surrounding the current location, the proposed location and the Oak Hill Hospital and any common areas between these rings.

ArcView GIS and the ArcView Business Analyst Extension were used to perform this analysis. The Business Analyst Extension includes demographic data from the CACI International Corporation. Census 2000 data supplemented the CACI data. Data sources will be noted throughout the analysis.

ANALYSIS 1

As shown in the attached Map 1, if the Brooksville Regional Hospital moves from its current location to the proposed location, the distance midpoint line between the Brooksville Hospital and the Dade City Hospital would pivot about a point in Pasco County. The question posed in this analysis is: how many Hernando County residents are affected by the shift in the distance midpoint line?

The area of the wedge in Hernando County was measured using ArcView GIS and determined to be 15 square miles. The US Census block groups which lie wholly or partially within that wedge were identified. The population density of these block groups was calculated using the total area and total population figures in the Census 2000 Summary File 1. This population density was then applied to the 15 square mile wedge and the total population in that wedge was determined to be 1,265. (See Table 1 for details.)

This total reflects that **1,265 Hernando County residents would be farther from the proposed Brooksville Regional Hospital than from the current Brooksville Regional Hospital.**

ANALYSIS 2

As shown in the attached Map 2, the ArcView GIS program drew a three-mile ring around each of the following hospitals: the current Brooksville Regional Hospital; the proposed Brooksville Regional Hospital; and the Oak Hill Hospital. ArcView also reported the associated population with each ring, using CACI demographic data for 2000. These populations are shown in Table 2. (Note that the CACI demographic data estimated the Hernando County population to be 130,798 for 2000. The US Census Bureau counted 130,802 residents in Hernando County for 2000.)

Using the same methodology as above, the square mileage was calculated for the area within the three mile rings which overlap, i.e. the common area between the current and proposed locations for Brooksville Regional Hospital. This area was determined to be 9.42 square miles. Again, the US Census Block Groups which lie wholly or partially within the overlapping area were identified and their population density calculated. This density was then applied to the 9.42 overlapping square miles and the total population of that area was determined to be 1,075.

Subtracting the population in the overlapping area, the net population in the three-mile ring surrounding the proposed location for the Brooksville Regional Hospital was determined to be 5,428. Thus, **5,428 Hernando County residents would be closer to the proposed Brooksville Regional Hospital than to the current Brooksville Regional Hospital.**

II. Potential Economic Contribution of Future Capital Expenditures.

Brooksville Regional Hospital proposes to relocate its facilities to a new campus. Relocation requires construction of a new hospital facility and furnishing of the new facility with new, modern equipment. The analysis that follows represents an estimation of the economic effect of new construction and equipment expenditures to Hernando County.

The inputs to the analysis were estimates provided by the Chief Financial Officer (CFO) of Brooksville Regional Hospital. Construction costs for the hospital are estimated to be: 150,000 sq. ft. @ \$200 per sq. ft. = \$30 million. Additionally, \$7 million capital expense for furnishings and equipment are anticipated. Within the new campus site, a medical office complex is planned to consist of: 30,000 sq. ft. @ \$100 per sq. ft. = \$3 million construction cost. The construction phase is anticipated to extend from middle of 2002 to the middle of 2004. Thus, allotted construction costs for the period of construction activity are: 25% in 2002, 50% in 2003, and 25% in 2004. Furthermore, the \$7 million has been allocated into \$2 million for furnishings and \$5 million for equipment. Since certain construction aspects must be finished prior to equipment purchase, 25% of the \$7 million has been assumed to be spent in 2003 and 75% in 2004. These amounts are reflected in the "Brooksville Regional Hospital (BRH) - New Facility Construction Expenditures" section in Appendix C.

The Regional Economic Models, Inc. (REMI) software and databases were used to estimate the change in the Hernando County economy based on the expenditures during the construction phase. REMI is a dynamic model that predicts how changes in an economy will occur on a year-by-year basis, using baseline data for the region from 1999. We report the findings as measured by differences in output (generally referred to as the economic impact), employment and aggregate personal income. The differences are measured from a forecasted baseline for Hernando's economy, if no changes were to occur.

Refer to the "Effects of BRH New Facility Construction Expenditures on Hernando County regional Output" section of Appendix C. The model produces the increase in demand in 1992 dollars. Hence, deflators (measures of inflation) are used to restate the demand in 2000 dollars. Considering the multiplier effect, we estimate that the \$40 million of expenditures during the construction phase will generate \$62.404 million of new demand for goods and services. However, all of the new demand will not be satisfied locally, i.e. Hernando County economic activity. We estimate that \$26.627 of the \$62.404 in new demand will be self-supply, i.e. Hernando County economic activity. That is, the overall regional purchase coefficient is 0.4267 - \$26.627 divided by \$62.404. Finally, we estimate that out of the \$40 million of direct expenditures about \$17.068 million will be spent in Hernando and that amount will multiply to an output of \$26.391 million in Hernando. (The output multiplier is \$26.391 divided by \$17.068 = 1.55.)

The economic impact on Hernando County of the proposed construction is \$26.391 million between 2002 and 2004. The local construction industry will be the primary beneficiary with an increase of \$21.874 million in economic activity. Retail trade would also be expected to benefit by \$1.572 million.

The "Effects of BRH New facility Construction Expenditures on Hernando County regional Employment" section in Appendix C summarizes the impacts of the project on employment. We estimate **jobs in Hernando County will increase during the construction phase by 79 jobs in 2002, 149 jobs in 2003 and 67 jobs in 2004.** Of course, the construction industry gains most of those jobs.

The "Effects of BRH New Facility Construction Expenditures on Hernando County regional Personal Income" section in Appendix C shows the impacts of the project to personal income. We estimate that if the construction project goes forward as planned, **the residents of Hernando County will have an aggregate increase of \$7 million in income between 2002 and 2004** over what is forecast, if there were no hospital construction.

Appendix A

Table 1

Hernando County Brooksville Regional Hospital Calculation of Population Affected by Distance Midpoint Shift							
Census Tract Block Group	401 1	401 4	401 5	402.02 3	403 1	403 2	TOTAL
Total Population	1,473	899	713	2,480	2,077	1,533	9,175
Area (Land) (in square meters)	96,313,086	22,032,438	17,981,860	28,838,732	40,248,950	65,105,908	270,520,974
Area (Water) (in square meters)	4,880,804	35,591	829,654	77,012	504,181	5,040,944	11,368,186
Area (Total) (in square meters)	101,193,890	22,068,029	18,811,514	28,915,744	40,753,131	70,146,852	281,889,160
Source: U.S. Census Bureau, Census 2000, Summary File 1							
Area Conversion Factor: 1,000,000 square meters equals square miles: 0.386102159							
Calculations:							
Total Area in Square Miles	39.07	8.52	7.26	11.16	15.73	27.08	108.84
Density per Square Mile	37.70	105.51	98.17	222.13	132.00	56.60	84.30
Wedge Square Mileage	15						
Average Population Density per square mile:	84.30						
Total Population in Wedge	1,264						

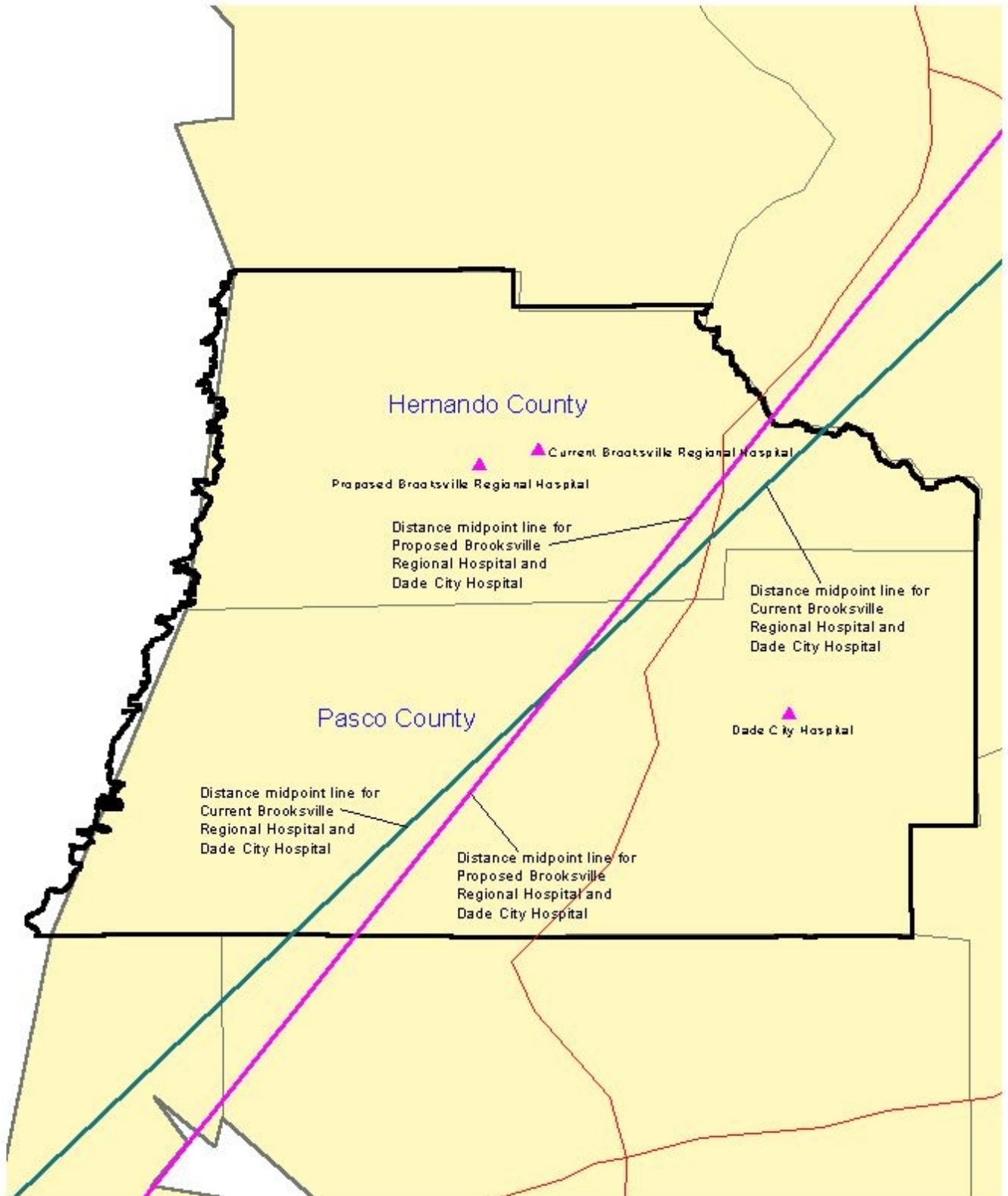
Appendix A

Table 2

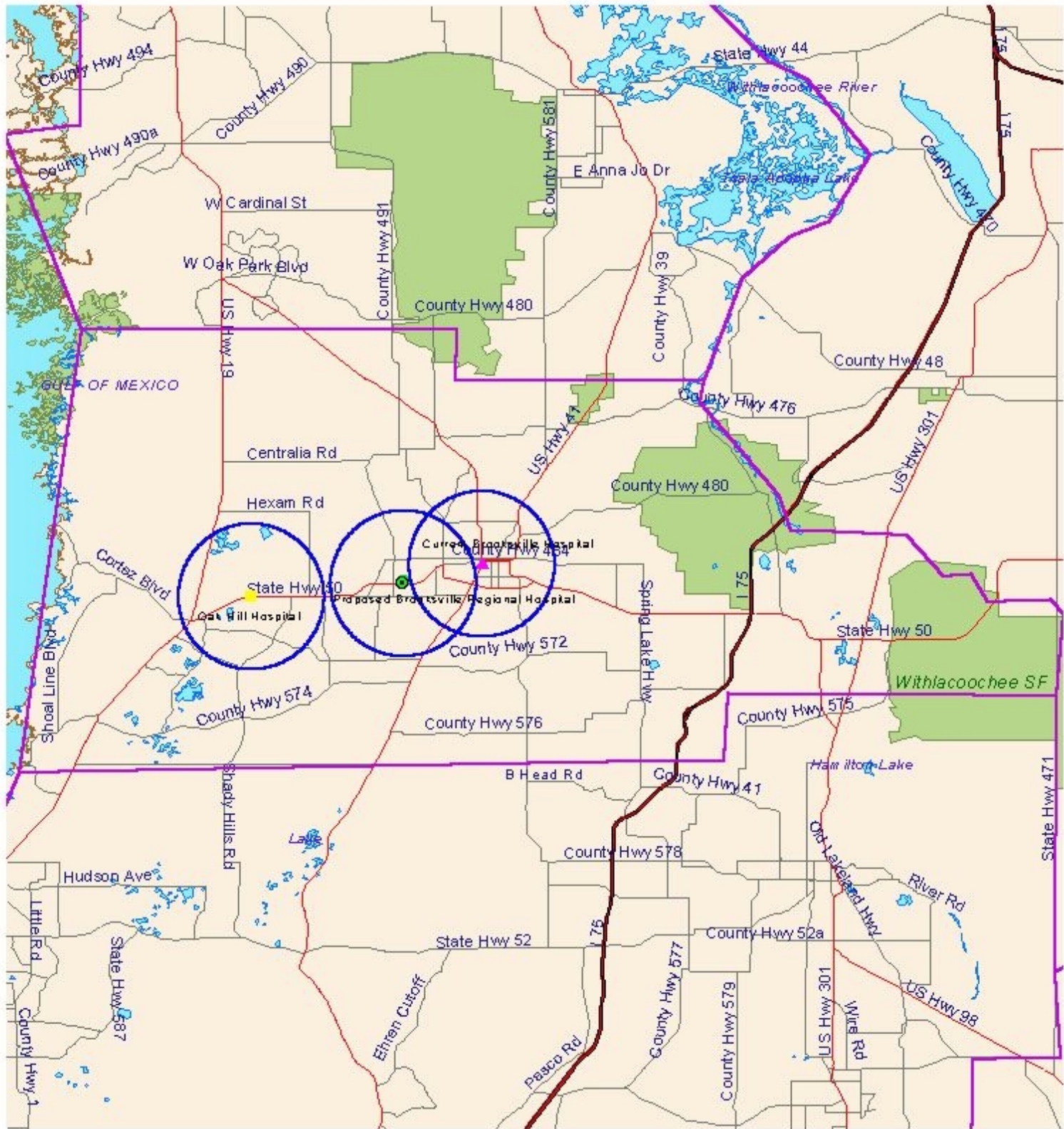
Hernando County Brooksville Regional Hospital Calculation of Net Population in Three Mile Rings Surrounding Hospitals							
Ring Description	Population	Net Population*					
Current Brooksville Regional Hospital	14,831	13,756					
Proposed Brooksville Regional Hospital	6,503	5,428					
Oak Hill Hospital	20,243	20,243					
<i>Source: CACI Demographic Data, CACI Marketing Systems</i>							
* Excludes population in overlapping area calculated below.							
Census Tract	403	405	405	405	406	409.04	TOTAL
Block Group	4	3	4	5	1	2	
Total Population	1,014	1,395	1,098	1,417	3,383	646	8,953
Area (Land) (In Square Meters)	35,785,132	5,157,095	4,636,442	6,015,318	129,942,150	16,991,618	198,527,755
Area (Water) (In Square Meters)	333,056	0	181,097	5,075	4,146,190	67,869	4,733,287
Area (Total) (In Square Meters)	36,118,188	5,157,095	4,817,539	6,020,393	134,088,340	17,059,487	203,261,042
<i>Source: U.S. Census Bureau, Census 2000, Summary File 1</i>							
Area Conversion Factor: 1,000,000 square meters equals square miles: 0.386102159							
Calculation of population in overlapping area between current and proposed location rings:							
Total Area in Square Miles	13.95	1.99	1.86	2.32	51.77	6.59	78.48
Density per Square Mile	72.71	700.59	590.30	609.60	65.34	98.08	
Overlapping Area Square Mileage	9.42						
Average Population Density per square mile:	114.08						
Total Population in Wedge	1,075						

Appendix B
GIS Mapping

Brooksville Regional Hospital Current and Proposed Locations Service Area Distance Midpoint Line Shift



Brooksville Regional Hospital Three Mile Ring Analysis



- 3 Mile Rings
- US Counties

- Hospital Locations
- Current Brooksville Hosp.
 - New Brooksville Hospital
 - Oak Hill Hospital

Appendix C

Brooksville Regional Hospital - Contributions to Hernando County

Brooksville Regional Hospital (BRH) - New Facility Construction Expenditures

	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>
	<u>Spending</u>	<u>Spending</u>	<u>Spending</u>
Hospital Construction (150,000 sf @ \$200/sf = \$30,000,000)	\$ 7,500,000	\$ 15,000,000	\$ 7,500,000
Hospital Furnishings & Equipment (\$7,000,000 total)			
REMI - Furnishings	\$ -	\$ 500,000	\$ 1,500,000
REMI - Instruments	\$ -	\$ 1,250,000	\$ 3,750,000
Medical Office Building Construction (30,000 sf @ \$100/sf = \$3,000,000)	\$ 750,000	\$ 1,500,000	\$ 750,000
Annual Spending	\$ 8,250,000	\$ 18,250,000	\$ 13,500,000

REMI - Differences (per year) as compared to Standard Regional Control

Appendix C

Effects of BRH New Facility Construction Expenditures on Hernando County regional Output

Deflators:

PPI - All, 1992 Annual Average to 2000 Annual Average =	1.1323
CPI - All, 1992 Annual Average to 2000 Annual Average =	1.2274

Demand is the amount of goods and services needed within the region. Demand equals imports plus Self-supply.

Difference in demand is affected by a change in consumption, investment, intermediate demand, state and local government spending, exports, or other exogenous components. Here we model a change in intermediate demand for construction inputs, furnishing inputs, and instrument inputs.

Demand by categories:	2002	2003	2004	Total Demand	Total Demand	Deflator
	Mil (92\$)	Mil (92\$)	Mil (92\$)	2002-2004 Mil (92\$)	2002-2004 Mil (00\$)	
Durables Manufacturing	2.432	6.258	6.764	15.454	17.498	PPI
Non-Durables Manufacturing	0.465	0.890	0.408	1.763	1.996	PPI
Mining	0.079	0.150	0.064	0.293	0.332	PPI
Construction	7.536	14.620	7.043	29.199	33.061	PPI
Transportation & Public Utilities	0.349	0.656	0.251	1.256	1.423	PPI
Finance, Insurance, & Real Estate	0.306	0.590	0.262	1.158	1.422	CPI
Retail Trade	0.450	0.855	0.366	1.671	2.051	CPI
Wholesale Trade	0.334	0.631	0.273	1.237	1.401	PPI
Services	0.707	1.331	0.531	2.568	3.152	CPI
Agriculture, Forestry, & Fisheries	0.017	0.031	0.014	0.062	0.070	PPI
Total Change in Demand	12.673	26.012	15.976	54.662	62.404	

Self-supply is the amount of demand furnished by regional sources. Self-supply equals the Regional Purchase Coefficient multiplied by Demand.

Difference in Self-supply is affected by a change in Regional Purchase Coefficient or a change in demand. Here, we model the change in Self-supply of construction inputs, furnishing inputs, and instrument inputs due to a change in intermediate demand for construction inputs, furnishing inputs, and instrument inputs.

Self-supply by categories:	2002	2003	2004	Total Self-supply	Total Self-supply	Deflator
	Mil (92\$)	Mil (92\$)	Mil (92\$)	2002-2004 Mil (92\$)	2002-2004 Mil (00\$)	
Durables Manufacturing	0.205	0.393	0.186	0.783	0.886	PPI
Non-Durables Manufacturing	0.011	0.020	0.007	0.039	0.044	PPI
Mining	0.036	0.069	0.032	0.138	0.156	PPI
Construction	5.002	9.703	4.658	19.363	21.924	PPI
Transportation & Public Utilities	0.124	0.231	0.083	0.438	0.496	PPI
Finance, Insurance, & Real Estate	0.102	0.191	0.070	0.362	0.445	CPI
Retail Trade	0.358	0.672	0.269	1.299	1.594	CPI
Wholesale Trade	0.114	0.214	0.087	0.414	0.469	PPI
Services	0.139	0.249	0.064	0.453	0.555	CPI
Agriculture, Forestry, & Fisheries	0.014	0.026	0.011	0.050	0.057	PPI
Total Change in Self-supply	6.104	11.768	5.467	23.339	26.627	

Appendix C

Overall Regional Purchase Coefficient = Total Change in Self-supply divided by Total Change in Demand

Overall Regional Purchase Coefficient = **0.4267**

Output is the amount of production in dollars, including all intermediate goods purchased as well as value added (compensation and profit); Output can also be thought of as Sales. Output equals Self-supply + Exports + Intraregional Trade + Exogenous Production.

Difference in Output is affected by a change in Demand or a change in a Regional Purchase Coefficient.

Regional Output by categories:	2002	2003	2004	Total Regional Output 2002-2004	Total Regional Output 2002-2004
	Mil (92\$)	Mil (92\$)	Mil (92\$)	Mil (92\$)	Mil (00\$) Deflator
Durables Manufacturing	0.198	0.370	0.149	0.717	0.812 PPI
Non-Durables Manufacturing	0.010	0.017	0.001	0.028	0.032 PPI
Mining	0.035	0.067	0.028	0.130	0.148 PPI
Construction	4.998	9.688	4.633	19.319	21.874 PPI
Transportation & Public Utilities	0.122	0.224	0.071	0.417	0.472 PPI
Finance, Insurance, & Real Estate	0.101	0.188	0.066	0.356	0.437 CPI
Retail Trade	0.356	0.666	0.259	1.281	1.572 CPI
Wholesale Trade	0.113	0.212	0.084	0.410	0.464 PPI
Services	0.137	0.241	0.050	0.428	0.526 CPI
Agriculture, Forestry, & Fisheries	0.013	0.025	0.010	0.049	0.055 PPI
Total Change in Regional Output	6.085	11.698	5.352	23.135	26.391

The Output Multiplier = change in regional output divided by (BRH Total Spending times RPC)

Output Multiplier = 1.55

This output multiplier only reflects the change in regional output due to a change in regional spending for construction, furnishing, and instrument inputs. Other coincident changes, such as a change in personal consumption due to an increase in employment and consequent change in income are not reflected.

Appendix C

Effects of BRH New Facility Construction Expenditures on Hernando County regional Employment

Employment is defined by the Bureau of Economic Analysis (BEA) concept based on place of work and includes full-time and part-time employees, as well as the self employed. An individual may have more than one job and, therefore be counted twice.

Difference in employment is affected by a change in consumption, investment, intermediate demand, state and local government spending, exports, or other exogenous components. Here, we model a change in intermediate demand for construction inputs, furnishing inputs, and instrument inputs.

Employment by categories:	2002 Jobs	2003 Jobs	2004 Jobs
Durables Manufacturing	1.67	3.13	1.32
Non-Durables Manufacturing	0.11	0.20	0.06
Mining	0.28	0.51	0.20
Construction	62.76	120.20	56.90
Transportation & Public Utilities	0.98	1.77	0.63
Finance, Insurance, & Real Estate	1.14	2.04	0.64
Retail Trade	6.70	12.13	4.33
Wholesale Trade	1.08	1.93	0.72
Services	3.54	6.15	1.34
Agriculture, Forestry, & Fisheries	0.70	1.31	0.54
Total Change in Employment	78.97	149.37	66.68

Appendix C

Effects of BRH New Facility Construction Expenditures on Hernando County regional Personal Income

Personal Income is defined by the Bureau of Economic Analysis (BEA) concept based on place of residence wherein personal income is the sum of wage and salary disbursements, other labor income, proprietor's income, rental income, personal dividend income, personal interest income, and transfer payments less personal contributions for social insurance.

Difference in personal income is affected by a change in any one of the items included in personal income as detailed above. Here, we model a change in intermediate demand for construction inputs, furnishing inputs, and instrument inputs.

Personal Income by categories:	2002	2003	2004	Total
	Mil (Nom\$)	Mil (Nom\$)	Mil (Nom\$)	2002-2004 Mil (Nom\$)
Durables Manufacturing	0.08	0.17	0.09	0.34
Non-Durables Manufacturing	0.01	0.01	0.01	0.02
Mining	0.01	0.02	0.01	0.04
Construction	1.23	2.51	1.35	5.10
Transportation & Public Utilities	0.04	0.07	0.04	0.15
Finance, Insurance, & Real Estate	0.03	0.05	0.03	0.11
Retail Trade	0.13	0.27	0.15	0.56
Wholesale Trade	0.04	0.08	0.04	0.15
Services	0.13	0.25	0.11	0.49
Agriculture, Forestry, & Fisheries	0.01	0.02	0.01	0.04
Total Change in Personal Income	1.70	3.46	1.83	7.00