



Project Report
751 South
Economic Impact Analysis

Prepared for
Southern Durham Development, Inc.
Raleigh, North Carolina

Submitted by
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company (ERA)**

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General & Limiting Conditions

Every reasonable effort has been made to ensure that the data contained in this report are accurate as of the date of this study; however, factors exist that are outside the control of Economics Research Associates (ERA), an AECOM company, and that may affect the estimates and/or projections noted herein. This study is based on estimates, assumptions and other information developed by Economics Research Associates from its independent research effort, general knowledge of the industry, and information provided by and consultations with the client and the client's representatives. No responsibility is assumed for inaccuracies in reporting by the client, the client's agent and representatives, or any other data source used in preparing or presenting this study.

This report is based on information that was current as of March, 2009 and Economics Research Associates has not undertaken any update of its research effort since such date. We have no obligation, unless subsequently engaged, to update this report or revise this analysis as presented due to events or conditions occurring after the date of this report.

Because future events and circumstances, many of which are not known as of the date of this study, may affect the estimates contained therein, no warranty or representation is made by Economics Research Associates that any of the projected values or results contained in this study will actually be achieved.

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This study is qualified in its entirety by, and should be considered in light of, these limitations, conditions and considerations.

Introduction and Executive Summary

Southern Durham Development, Inc. (SDD) is proposing the development of *751 South*, a mixed-used community, on 164 acres in southwestern Durham County, North Carolina. *751 South* is designed as a Traditional Neighborhood Development (“TND”), using vertical integration to provide multiple housing choices. With an emphasis on pedestrian connectivity, the goal is to create lively streets and civic spaces. The mix of uses will include a market or grocery, lifestyle retail shops, neighborhood shops, offices, apartments, townhouses, and single-family homes, while allowing for multiple civic sites.

Economics Research Associates (ERA) was retained to prepare an economic impact analysis of *751 South*. The purpose of which is to provide an estimate of the level of economic activity and jobs that will be generated both during the construction period and as the result of ongoing operations. The report also includes estimates of annual sales and property taxes generated by the project.

751 South consists of the following land-use components:

- 300,000 square feet of retail space
- 300,000 square feet of office space
- 645 apartments
- 358 condominiums
- 170 townhomes
- 107 single-family homes

In addition, SDD plans to donate 26 acres of land to the Durham Public Schools as well as substation sites for the Durham County Fire Department and the Sheriff. Substantial road improvements costing \$6.0 million are planned for Highway 751 and nearby intersections. The collective value of these contributions to the local governments exceeds \$11.4 million.

The economic benefits of *751 South* to Durham County are summarized below:

- 3,752 cumulative jobs and labor income of \$166.9 million over the construction period

- 2,980 permanent jobs with annual labor income of \$154.2 million as a result of ongoing operations; including a significant number of professional jobs in fields such as healthcare, computer and engineering, business and financial, office and administrative support. These job estimates exclude employment generated at the new schools and other on-site civic uses.
- Ongoing annual Articles 39 and 42 local option sales tax revenue of \$1.3 million resulting from estimated taxable sales in the retail establishments
- Annual Durham County real property taxes of \$3.2 million and annual vehicle property taxes of \$198,000
- If *751 South* is annexed into the City of Durham, the project will generate annual City real property taxes of \$2.4 million and annual vehicle property taxes of \$151,000
- Land donation and site improvements for Durham Public Schools in excess of \$5.4 million
- Fire and sheriff substation sites valued at \$900,000
- Road improvements to Highway 751 and nearby intersections totaling \$6.0 million

Although beyond the scope of this study, both the City and the County will realize additional annual revenues directly associated with the project such as business license and permit revenues, Article 40 local option sales tax, business personal property taxes, and Article 39 and 42 local option sales taxes generated by consumer spending of the new residents at off-site Durham County retailers. The project will also produce considerable sales tax revenues for Durham County during the construction period.

The Economic Impacts of *751 South*

The economic impacts of *751 South* will be experienced primarily in Durham County but will also extend to areas beyond the County's jurisdictional borders. The study area was limited to Durham County which results in conservative estimates since the economic impacts on the region and the State are excluded.

The development of *751 South* will impact the Durham County economy in two phases. The initial impact occurs during the development of the property. Once development is completed, the operating activities of the retail and office facilities and the consumer spending by the new residents will impact the local economy on an ongoing basis. As noted economic impacts on the region will be larger than those occurring within the boundaries of Durham County. Usually the smaller the study

area, the more the leakages (purchases and sales) will occur outside the area. Fewer ripple effects will occur inside the area. Thus multipliers and the related impacts generally become larger as the geographic area increases in size.

This analysis utilizes models generated by the IMPLAN modeling system.¹ IMPLAN is a nationally recognized system of local economic models that are specifically designed to represent a local economy such as Durham County. The IMPLAN models are modifications of the national input-output models developed by the Bureau of Economic Analysis, US Department of Commerce. The IMPLAN models incorporate the most recent data available.²

The methodology and assumptions underlying this analysis are described later in this report. All amounts are presented in constant dollars (2009) to avoid including any impact as a result of inflation.

Construction Period Impacts of 751 South

The economic impacts from the construction phase of *751 South* are outlined in this section. These impacts are assumed to occur over the project’s anticipated 10-year construction period.

Based on estimates by the developer, the construction phase of the development will result in direct investment of approximately \$414.5 million at the time of the project’s completion. For economic impact modeling purposes, direct investment includes all horizontal and vertical development costs but excludes the cost of land.

Assumptions for the construction program, by land use type, are as follows:

Table 1: Buildout Assumptions for 751 South

| | Commercial Square Footage or Residential Units | | | |
|---------------|--|-----------|------------|---------|
| | Years 1-3 | Years 4-6 | Years 7-10 | Total |
| Retail | 150,000 | 125,000 | 25,000 | 300,000 |
| Office | 75,000 | 75,000 | 150,000 | 300,000 |
| Apartments | 300 | 195 | 150 | 645 |
| Condos | 167 | 108 | 83 | 358 |
| Townhomes | 79 | 51 | 40 | 170 |
| Single-Family | 50 | 32 | 25 | 107 |

Source: SDD, 2009.

¹ IMPLAN is the regional modeling system developed by MIG, Inc., Stillwater, MN.

² The latest data available for the IMPLAN modeling system are for 2007. However, the final dollar impacts estimated in this analysis reflect 2009 prices.

As the development dollars are spent and re-spent in Durham County, additional income is created for those companies and individuals supplying goods and services in support of the site's development. The recipients will spend this income on other goods and services. Each time, some of the purchases will be for goods and services inside Durham County and some will be for goods and services from outside the area (referred to as "leakages"). The well known "multiplier effect" estimates the aggregate amount of local buying and selling that occurs.

The multipliers used in this analysis estimate three components of total change within the local area:

- *Direct effects* represent the initial change in the industry in question.
- *Indirect effects* account for changes in inter-industry transactions as supplying industries respond to increased demands from the directly affected industry.
- *Induced effects* reflect changes in local spending of income that result from changes in the directly and indirectly affected industry sectors.

The cycle of spending continues until leakages from the region (spending on goods and services outside the area) end the cycle. Due to these multiplier effects, the initial, direct investment results in indirect and induced impacts of additional dollars.

Economic impacts over the 10-year construction period are summarized in Table 2.

Table 2: Construction Period Impacts of 751 South – Retail, Office, and Residential

| Years 1 - 3 | Direct | Indirect | Induced | Total |
|------------------------------------|---------------|-----------------|----------------|---------------|
| Output | \$190,492,000 | \$49,528,000 | \$20,376,000 | \$260,396,000 |
| Employment | 1,107 | 434 | 181 | 1,722 |
| Labor Income | \$50,224,000 | \$19,307,000 | \$6,970,000 | \$76,501,000 |
| Years 4 - 6 | Direct | Indirect | Induced | Total |
| Output | \$124,733,000 | \$32,283,000 | \$13,364,000 | \$170,380,000 |
| Employment | 727 | 282 | 119 | 1,128 |
| Labor Income | \$33,011,000 | \$12,578,000 | \$4,572,000 | \$50,161,000 |
| Years 7 - 10 | Direct | Indirect | Induced | Total |
| Output | \$99,314,000 | \$25,577,000 | \$10,713,000 | \$135,604,000 |
| Employment | 585 | 222 | 95 | 902 |
| Labor Income | \$26,571,000 | \$9,969,000 | \$3,665,000 | \$40,205,000 |
| Cumulative Years 1 - 10 | Direct | Indirect | Induced | Total |
| Output | \$414,539,000 | \$107,388,000 | \$44,453,000 | \$566,380,000 |
| Employment | 2,419 | 938 | 395 | 3,752 |
| Labor Income | \$109,806,000 | \$41,854,000 | \$15,207,000 | \$166,867,000 |

Source: SDD, ERA, IMPLAN, 2009.

As seen in Table 2, the cumulative effects of the multiplier cause the direct development costs totaling \$414.5 million to result in an indirect impact of \$107.4 million and an induced impact of \$44.5 million resulting in a total increase in output of \$151.9 million in Durham County over buildout. Annual levels of output, labor income and employment will vary with the pace of site development over the 10-year period.

Jobs will also be created during the development period. It is estimated that 2,419 jobs will be created in Durham County directly from the development of the site. In addition to these direct jobs, another 1,333 jobs will be created as indirect and induced impacts – for a total of 3,752 jobs in Durham County. On average, 375 full-time and part-time jobs are projected each year over the 10-year buildout period. No permanent job creation from development activities is assumed.

During the development phase, Durham County will experience an increase in labor income. As reflected in Table 2, the cumulative effects of the multiplier cause the direct investment of \$414.5 million to result in cumulative direct impacts on labor income in Durham County of \$109.8 million. These dollars circulate throughout the County and result in a cumulative indirect impact of \$41.9

million in labor income and induced labor income impact of \$15.2 million. Cumulative labor income impacts in Durham County total \$166.9 million during the construction phase. On average, the labor income is expected to be \$16.7 million per year over the construction period.

Ongoing Annual Impacts of 751 South

More important than the impacts from the construction activity is the permanent economic activity generated by the retail and office facilities at 751 South as well as the personal income of the new households. The current economic recession may reduce new growth in the near term but strong growth projections for the region should be realized over the next ten years; therefore, the personal income of the 751 South households is assumed to be new income in Durham County.

Professional Office and Retail

To calculate the economic impacts of the new retailers and professional offices, the estimated new employees were assumed as the direct impact. To project the number of new office employees, the total office square footage of 300,000 was adjusted to 270,000 occupied square feet based on vacancy rate data compiled by ERA. The vacancy-adjusted square footage of 270,000 was then divided by 257 square feet per employee, a reasonable metric for new office construction, resulting in 1,050 new professional office jobs.

The permanent annual impacts of these new 1,050 professional office jobs on the Durham County economy is shown in Table 3.

Table 3: Annual Economic Impacts in Durham County of the 751 South Professional Office Jobs

| Office | Annual Direct | Annual Indirect | Annual Induced | Total Annual Impacts |
|--------------|---------------|-----------------|----------------|----------------------|
| Output | \$176,810,000 | \$39,281,000 | \$27,369,000 | \$243,460,000 |
| Employment | 1,050 | 315 | 243 | 1,608 |
| Labor Income | \$84,492,000 | \$14,508,000 | \$9,362,000 | \$108,362,000 |

Source: SDD, Planner's Estimating Guide: *Projecting Land-Use and Facility Needs*, ERA, EDIS, IMPLAN, 2009

To validate the reasonableness of the direct labor income projection of the IMPLAN model, ERA compared the average annual wage to comparable sectors for Durham County in the N.C. Department of Commerce EDIS system.

Retail square footage was used to project the number of retail employees by applying appropriate square footage per employee ratios published by Arthur C. Nelson in the Planner's Estimating Guide: *Projecting Land-Use and Facility Needs*. American Planning Association, 2004. The estimates were

further adjusted to reflect seven days of operation per week. The final adjustment is reflected in Table 4 below. Since the primary data sources used in the IMPLAN model consist of full-time and part-time employees, the following Bureau of Economic Analysis (BEA) conversion coefficients were applied to arrive at 683, the estimated number of new retail jobs in *751 South*.

Table 4: 751 South Estimated Retail Jobs

| | FTE Jobs | FTE to FT/PT Conversion | Total FT/PT Jobs |
|------------------------------------|----------|-------------------------|------------------|
| Retail FTE Jobs - Vacancy Adjusted | 595 | 0.8706 | 683 |

Source: BEA, IMPLAN, 2009.

The permanent annual impacts of these 683 new retail jobs on the Durham County economy is shown in Table 5.

Table 5: Annual Economic Impacts in Durham County of the 751 South Retail Jobs

| Retail | Annual Direct | Annual Indirect | Annual Induced | Total Annual Impacts |
|--------------|---------------|-----------------|----------------|----------------------|
| Output | \$38,388,000 | \$7,118,000 | \$5,234,000 | \$50,740,000 |
| Employment | 683 | 52 | 46 | 782 |
| Labor Income | \$17,341,000 | \$2,386,000 | \$1,791,000 | \$21,518,000 |

Source: SDD, Planner's Estimating Guide: *Projecting Land-Use and Facility Needs*, ERA, EDIS, IMPLAN, 2009

As with the new office jobs, ERA compared the reasonableness of the direct labor income projection of the IMPLAN model to the average annual retail wage for Durham County in the N.C. Department of Commerce *EDIS* system.

Consumer Spending of New 751 South Households

The 1,280 new households in *751 South* will stimulate the Durham County economy through consumer spending. To estimate the total economic impact of the new residents, the disposable personal income (DPI) of the new households was assumed as the direct impact.

A series of calculations was performed to estimate the new disposable personal income of *751 South* households. Based on ratios of home value to household income provided in the *Federal Reserve Bulletin: 2007 Survey of Consumer Finances* and spending data by level of household income reported in the Bureau of Labor Statistics (BLS), *Consumer Expenditure Survey, 2007*, disposable personal income was projected as follows.

Table 6: Estimated Annual Disposable Income of New 751 South Households

| Type of Residence | Total HH DPI |
|-------------------|---------------------|
| Apartments | \$30,315,000 |
| Condos | 31,146,000 |
| Townhomes | 18,530,000 |
| Single-Family | 18,939,000 |
| Total | \$98,930,000 |

Source: SDD, *Federal Reserve Bulletin*, BLS, ERA, 2009.
 IMPLAN defines DPI as Personal Income less Savings and Taxes

The permanent annual impact of these new households on the Durham County economy is shown in Table 7. The economic impact of the 751 South residents is substantial; in total creating demand for 714 new jobs with labor income of \$27.4 million.

Table 7: Annual Economic Impacts in Durham County of the Consumer Spending by 751 South New Households

| Residential | Annual Direct | Annual Indirect | Annual Induced | Total Annual Impacts |
|--|---------------|-----------------|----------------|-------------------------|
| Total New Household Disposable Income | \$98,930,000 | | | |
| Output Captured | \$60,411,000 | \$13,274,000 | \$7,091,000 | \$80,776,000 |
| Employment | 562 | 89 | 63 | 714 |
| Labor Income | \$20,529,000 | \$4,401,000 | \$2,426,000 | \$27,356,000 |

Source: SDD, *Federal Reserve Bulletin*, BLS, ERA, IMPLAN, 2009

Total Permanent Annual Economic Impacts of 751 South on the Durham County Economy

Before computing the grand total of the economic impacts of 751 South, the impacts of the new households for the on-site retail must be deducted to avoid double counting. Based on detailed sector calculations, these impacts total 123 jobs with associated labor income of \$3.1 million.

As indicated in Table 8, the commercial and residential economic impacts of 751 South on the Durham County economy are significant. At buildout, the project is expected to produce 2,980 new jobs with estimated annual labor income of \$154.2 million.

Table 8: Total Annual Economic Impacts of 751 South on Durham County

| All Land Uses | Annual Direct | Annual Indirect | Annual Induced | Total Annual Impacts |
|---|----------------------|------------------------|-----------------------|-----------------------------|
| Output | \$275,609,000 | \$59,673,000 | \$39,694,000 | \$374,976,000 |
| Employment | 2,295 | 456 | 352 | 3,103 |
| Labor Income | \$122,362,000 | \$21,295,000 | \$13,579,000 | \$157,236,000 |
| 751 South Residential Retail Spending Impact Adjustment | | | | |
| <i>Adjustment necessary to avoid double counting the impacts of new resident purchases in 751 South retail establishments</i> | | | Output | -\$20,712,000 |
| | | | Employment | -123 |
| | | | Labor Income | -\$3,075,000 |
| Total Annual 751 South Economic Impact For Durham County | | | | |
| | | | Output | \$354,264,000 |
| | | | Employment | 2,980 |
| | | | Labor Income | \$154,161,000 |

Source: SDD, BLS, *Federal Reserve Bulletin*, ERA, IMPLAN, 2009.

The IMPLAN Occupational Matrix feature converts employment by industry sector to jobs by occupation. As seen in Table 9, the 2,980 new permanent jobs span a wide range of occupations thereby offering a variety of employment and economic development opportunities.

Table 9: New Permanent Jobs By Occupation

| Occupation | Jobs |
|--|-------|
| Management occupations | 164 |
| Business and financial operations occupations | 283 |
| Computer and mathematical science occupations | 102 |
| Architecture and engineering occupations | 35 |
| Life, physical, and social science occupations | 52 |
| Community and social services occupations | 24 |
| Legal occupations | 16 |
| Education, training, and library occupations | 45 |
| Arts, design, entertainment, sports, and media occupations | 43 |
| Healthcare practitioners and technical occupations | 109 |
| Healthcare support occupations | 53 |
| Protective service occupations | 22 |
| Food preparation and serving related occupations | 189 |
| Building and grounds cleaning and maintenance occupations | 96 |
| Personal care and service occupations | 83 |
| Sales and related occupations | 601 |
| Office and administrative support occupations | 756 |
| Farming, fishing, and forestry occupations | 3 |
| Construction and extraction occupations | 20 |
| Installation, maintenance, and repair occupations | 86 |
| Production occupations | 57 |
| Transportation and material moving occupations | 141 |
| | 2,980 |

Source: ERA, IMPLAN, 2009.

Annual Property and Sales Tax Impacts of 751 South

Real Property Taxes

Upon completion, the estimated real property tax base of *751 South* is expected to be \$452.8 million as reflected in Table 10. The valuation of the commercial and residential properties was performed by SDD based on extensive local experience and internal market research; including comparable communities such as Colvard Farms, Meadowmont and Southern Village.

Given the current tax rate of \$0.7081, the project will generate annual real property taxes of \$3.2 million for Durham County. With the project annexed into the City and the current tax rate of \$0.5400, *751 South* will generate annual real property taxes of over \$2.4 million for the City. In total, *751 South* will yield \$5.7 million annual real property tax revenues.

Table 10: 751 South Real Property Tax Base and Annual Real Property Tax Revenue

| Land Use | Real Property Tax Base | Durham County Property Tax | Durham City Property Tax | Total Property Tax |
|--------------|------------------------|----------------------------|--------------------------|--------------------|
| Commercial | \$90,000,000 | \$637,000 | \$486,000 | \$1,123,000 |
| Residential | 362,788,000 | 2,569,000 | 1,959,000 | 4,528,000 |
| Total | \$452,788,000 | \$3,206,000 | \$2,445,000 | \$5,651,000 |

Source: SDD, ERA, 2009

As previously mentioned, the project will also produce annual business personal property tax revenue from assets of the commercial facilities.

Local Option Sales Taxes

751 South will create new sales tax revenue for Durham County from two sources: the new retail establishments and the consumer spending of the new residents.

Currently, Durham County receives local option sales taxes from four sources.

- Article 39: One cent on every dollar, distributed to the county directly based on the delivery of the goods.
- Article 40: One-half cent on every dollar, collected in a statewide pool and distributed to counties based on proportionate population. 30% must be spent on school capital or debt.
- Article 42: One-half cent on every dollar, collected in a statewide pool and distributed to counties based on proportionate population. 60% must be spent on school capital or debt. As part of the Medicaid Relief legislation, the distribution method will convert to delivery of goods basis in FY10.
- Article 44: One-half cent on every dollar with 50% distributed to counties based on delivery of goods and the remaining 50% distributed by proportionate population. In conjunction with the Medicaid Relief legislation, this one-half cent tax will be phased out in full FY10.

Due to the pending sales tax changes, this analysis is limited to the potential impact of Articles 39 and 42 sales taxes and excludes consideration of the Article 44 sales tax. Although Article 40 sales tax revenues for Durham County will likely increase due to population added by the new households, this study does not include estimates of Article 40 impacts.

To estimate the annual sales tax revenues from the retail parcels, ERA relied upon a retail market study prepared by the Gibbs Planning Group and retail demand analysis data compiled by SDD. A summary of results and the corresponding annual sales tax projections are reflected in Table 11. As reported in the table, anticipated annual Article 39 and 42 sales tax revenues are expected to exceed \$1.3 million of which \$260,000 per year will be dedicated to public school capital outlay.

Table 11: 751 South Durham County Annual Local Option Sales Tax Revenue

| | Retail Square Footage | Weighed Average Annual Est. Sales Per SF | Estimated Annual Sales |
|--|---|---|---------------------------------------|
| Assumed Occupied Retail Square Footage | 285,000 | \$307 | \$87,606,000 |
| Assumed Vacant Retail Square Footage * | 15,000 | | |
| | <u>300,000</u> | | |
| | 1% Article 39 Annual Sales Tax | 0.5% Article 42 Annual Sales Tax | Total Annual Sales Tax |
| | \$876,000 | \$438,000 | \$1,314,000 |
| 60% Restricted to Public School Capital Outlay | | \$263,000 | |

**Dollars & Cents of Shopping Centers/The SCORE ® 2008*

Source: SDD, Gibbs Planning Group, ERA, 2009

Although beyond the scope of this study to estimate, consumer spending by the new 751 South residents at retail establishments throughout Durham County will generate additional Article 39 and 42 sales taxes.

Vehicle Property Tax

The vehicles owned by the new residents of 751 South will produce property tax revenue for Durham County and for the City of Durham, if the project is annexed. The estimated value of vehicles owned by residents of 751 South was computed by using median household income and median household vehicle value relationships reported in the *Federal Reserve Bulletin: 2007 Survey of Consumer Finance* published in February 2009. Table 12 estimates the annual vehicle property taxes of \$198,000 for Durham County and \$151,000 for the City.

Table 12: 751 South Annual Vehicle Property Taxes

| Land Use | Units | Estimated Vehicle Tax Base |
|---------------------------------------|-------|----------------------------------|
| Apartments | 645 | \$9,417,000 |
| Condos | 358 | 9,093,000 |
| Townhomes and Single-Family | 277 | 9,390,000 |
| Totals | 1,280 | \$27,900,000 |
| Durham County Property Tax Rate | | \$0.7081 |
| Durham County Vehicle Property Taxes | | \$198,000 |
| City of Durham Property Tax Rate | | \$0.5400 |
| City of Durham Vehicle Property Taxes | | \$198,000 |

Source: SDD, *Federal Reserve Bulletin*, ERA, 2009.

Methodology

This study estimates the economic impacts of the proposed *751 South* on the Durham County economy. The methodology used in this study is the IMPLAN regional input-output modeling system developed by MIG, Inc. of Stillwater, Minnesota. IMPLAN was developed by MIG, Inc. as a cost-effective means to develop regional input-output models. The IMPLAN accounts closely follow the accounting conventions used in the “Input-Output Study of the US Economy” by the Bureau of Economic Analysis (1980) and the rectangular format recommended by the United Nations.

The IMPLAN Input-Output Model mathematically describes commodity flows from producers to intermediate and final consumers. Purchases for final use (final demand) drive the model. Industries producing goods and services for final demand also purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services (indirect purchases) continues. Leakages from the region eventually stop the cycle.

The IMPLAN input-output model mathematically derives the indirect and induced effects. The resulting multipliers describe the change in output for every regional industry caused by a one-dollar change in final demand for any given industry. The notion of a multiplier rests upon the difference between the initial effect of a change in final demand and the total effects of that change. Total effects are the direct effects plus indirect effects, plus induced effects. Direct effects are the production changes associated with initial final demand changes. Indirect effects are production changes in backward-linked industries caused by the changing input needs of directly effected

industries. Induced effects result from the household expenditures from the directly or indirectly generated labor income.

In essence, the multipliers estimated by this methodology represent the consecutive rounds of buying and selling that ripple through an economy. To produce one dollar of new product, employees must be hired and paid. The wages paid to these workers will then be spent on goods and services, such as food, gasoline, clothes, housing, etc. within the region and outside the region. As these cents are spent, they become income to the recipient, and the spending continues over and over again. The induced effect is the cumulative amount of spending.

The economic activity of the project also requires intermediate inputs to be purchased such as electricity, raw materials, transportation services, labor etc. These expenditures become income to the recipient and pay for the purchases of raw materials, labor, etc. They, in turn, are then spent over and over again in the economy. Purchases made from outside the region are considered “leakages” from the economy. The consecutive rounds of selling goods and services continue until these leakages from the region end the cycle. The indirect effect is the cumulative amount of such spending.

The IMPLAN databases consist of two major parts: national-level matrices and tables and economic and physical data at the county and/or state level. The national matrices are used with regional data to create a regional model. The following national-level matrices are included with each IMPLAN database.

1. The *National Absorption Table* is a coefficient form of the National Use Table derived by dividing each element of the Use Table by the respective industry’s total dollar output. The resulting Absorption Table shows how an industry spends each dollar of outlay on goods and services to produce a dollar of output. Each column is an industry’s production function reflecting the proportions of commodities used to produce one dollar of output.
2. The *National Byproducts Table* is a coefficient form of the National Make Table derived by dividing each element by the Make Table row (industry) totals. Each industry can produce more than one commodity. The Byproducts Tables shows what percentage of an industry’s total output each commodity represents.
3. Deflators are used to adjust values from one time period to another.
4. Margins split a purchaser price into the appropriate producer values.

The local economic data in an IMPLAN database include Industry Output, Employment, Value Added and Final Demands. The value-added components are employee compensation, proprietors’ income, other property type income, and indirect business taxes. The final demands components in the initial Final Demands Table are personal consumption expenditures, state and local education and non-education purchases, federal military and non-military purchases, inventory purchases and capital formation. Regional data is applied to the national matrices to create a set of regional accounts.

ERA Company Profile

Economics Research Associates, an AECOM company (ERA), is an international consulting firm providing research, applied economic analysis, and strategic planning services to a wide range of clients. We work primarily in real estate, public facilities, entertainment and leisure, and land-use policy and planning. Our clients include private entities, government agencies, and non-profits.

ERA's services are designed to help our clients understand their markets, assess risks, and clarify the uncertainties inherent in any development initiative, business strategy, or public policy initiative. At ERA, our job is often to pull ideas into focus, and to sharpen the boundaries of a preliminary plan or concept. We comprehend our client's vision – whatever the scope, objective or location – and address their challenges through creative thinking, structured analysis, and clear and concise communications.

ERA was founded as Economics Research Associates in Southern California in 1958 and joined AECOM in 2007, dramatically expanding our reach and service capability. Our primary offices are in Los Angeles, Chicago, San Francisco, San Diego, Denver, New York, London, Washington DC and Hong Kong. ERA is in the process of establishing a new office in North Carolina.

Over the firm's history, ERA has made important contributions to some of the world's most innovative and successfully development projects, visitor attractions, urban plans, and economic policy evaluations.

Emil E. Malizia, Ph.D.

Dr. Emil Malizia is an adjunct consultant to ERA and is president of Malizia & Associates, LLC. He also serves as Professor and Chair of City and Regional Planning at the University of North Carolina at Chapel Hill.