

GEORGIA SOUTHERN UNIVERSITY

Economic Impact of the Proposed Effingham Parkway

A Dynamic Regional Economic Analysis

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This study uses REMI to analyze the economic impact of the proposed Effingham Parkway on the regional economy, as well as the sub-regional distribution of the impacts on the cities within Effingham County, GA and the inter-regional impacts on Chatham County. The proposed parkway will follow State Road 119 in Central Effingham County, traveling along a southeastern route into northern Chatham County, terminating at I-95.

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Introduction

The Effingham Parkway is a proposed transportation corridor designed to alleviate congestion on State Road 21 (SR 21). The proposed corridor will involve improvements to existing State Road 119 (SR 119) in central Effingham County traveling along a southeastern route into Northern Chatham County. The proposed Effingham Parkway will terminate at I-95.

Outside of the Atlanta Metro area, Effingham County has been one of the fastest growing counties in Georgia for nearly a decade. The majority of the growth has been population growth spilling over from Chatham County. Typical of suburbanization, a growing population base has resulted in growth in service businesses within Effingham County, but the labor market remains tied to the primary growth center, in this case Chatham County. The attendant congestion on smaller, local roads resulting from combined growth in population and business results in rising transportation costs for all travelers. These costs are also incurred in both the urban, Chatham County area, and suburban location, Effingham County. The congestion problem in Effingham County is compounded by the heavy traffic associated with the growth at the Port of Savannah.

This study is based on the corridor project as described in “Proposed Concepts Report: CSMSL-0006-00(700)” prepared by the Georgia Department of Transportation. In particular, the focus of this project is to estimate the economic impacts and the economic benefits of reductions in travel times the corridor is expected to provide. Reducing the time required for travel reduces the cost to businesses and also creates a saving for households. For households the savings is savings on the commute to work and savings in terms of the cost of producing household services.

In section one of this report, the methodology and data used in the analysis are discussed. Section one also describes the region and sub-regions used in the analysis. Section two of the report provides a community profile. Section three provides the findings as to the economic impacts and benefits of the proposed corridor.

1. Methodology

Region

The Figure 1 shows the proposed route for the Effingham Parkway. The proposed parkway will start in Chatham County at Jimmy DeLoach Parkway and travel through Effingham County ending at State Route 119. It will parallel SR 21.

Although the majority of the road will be in Effingham County, the proposed corridor will impact a significant region surrounding Effingham County. For the purposes of this study the region of impact is defined as: Bryan; Bulloch; Candler; Chatham; Effingham; Emanuel; Evans; Jenkins; Liberty; Screven; and, Tattnall counties in Georgia and Beaufort; Hampton; and, Jasper counties in South Carolina. See Figure 2.

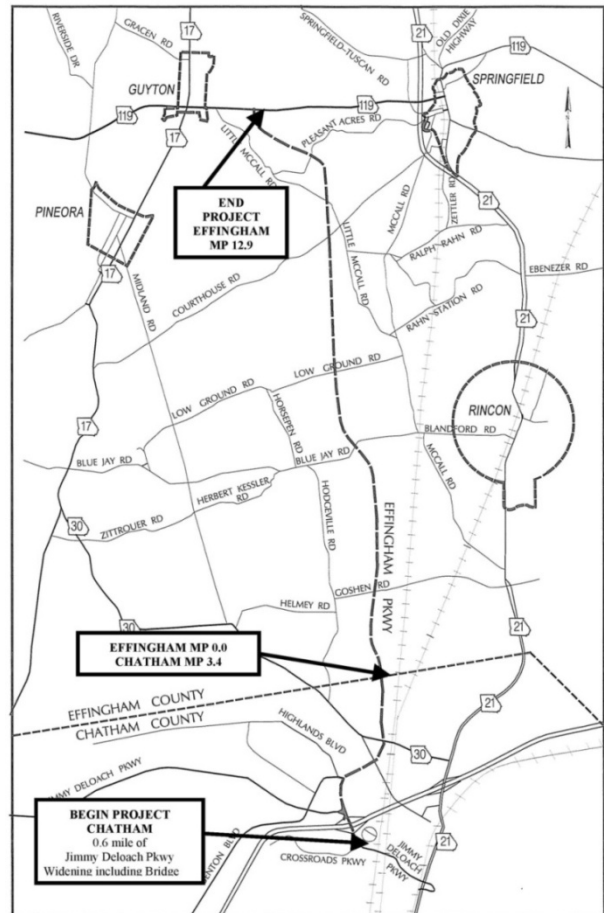
Proximity to or distance from the corridor is taken into consideration in the calculations of the impacts and benefits of the proposed corridor. For example, someone from Candler County will have a much smaller economic benefit because of distance and expected rates of use of the road when compared to someone in Screven County. However, there will be some benefit to all in the region because the proposed corridor will relieve congestion on SR 21, a main artery connecting the region

to Savannah.

In addition to estimates of the region wide impact, this study will provide estimates of the economic impact for several sub-regions including: Effingham County; City of Springfield; City of Rincon; Chatham County; and, Bulloch County.

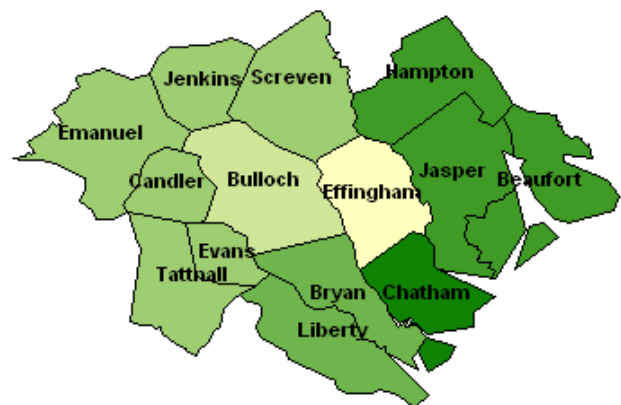
The economic impacts within Effingham County are estimated based on the distribution within the county of employment and sales. The 19 sector NAICS detail for 2007 employment and sales as compiled from the National Establishment Time-Series (NETS) was used to determine the percent of businesses by sub-region within Effingham County.

Figure 1
Project Location Map



Source: Georgia Department of Transportation

Figure 2
Regional Economy



Traffic

This study relies on the traffic estimates generated by the Georgia Department of Transportation in project number CSMSL-0006-00(700) on October 9, 2008. The estimated traffic counts and the 2035 build versus no-build estimates were used to determine the potential time and cost savings.

The Georgia DOT study determined that the commercial trucking was about 4% of the total average daily traffic. Although the Port of Savannah continues to experience increases in the volume of cargo it moves and one might expect growth in port related traffic might outpace growth in general traffic, the Georgia DOT study held that variable constant. Table 1 below shows average daily trips by road segment from the Georgia DOT study.

Table 1
Traffic Estimates

Roadway Section	Existing – Year 2007			No-Build – Year			Build – Year 2035		
	ADT	Lanes	LOS	ADT	Lanes	LOS	ADT2	Lanes2	LOS2
SR 21 North of Springfield	5250	4	A	12600	6	C	14500	6	C
SR 21 North of Rincon	15900	4	B	38000	4	E	32350	4	D
SR 21 South of Rincon	35450	4	D	58490	4	F	49700	4	D
SR 21 North of SR 30	30700	4	C	45500	6	C	45500	6	C
SR 21 between SR 30 & I-95	36450	4	E	85050	8	F	59800	8	C
SR 21 South of I-95	31650	4	C	51900	4	E	35500	4	D
SR 30 West of Montieth Road	11100	2	C	26900	4	B	28700	4	B
SR 30 between Effingham Pkwy to SR 21	7700	2	C	51650	6	C	27600	6	B
Montieth Road South of SR 30	5450	2	C	12200	2	C	12200	2	C
Little McCall Road – North of Courthouse Rd	2300	2	A	5350	2	C	--	--	--
McCall Rd – North of Blue Jay Rd	5150	2	B	12200	2	F	--	--	--
McCall Rd – North of Goshen Rd	3650	2	B	8700	2	D	--	--	--
Jimmy Deloach East of Highlands Blvd	9100	4	B	33100	4	C	59100	6	D
Jimmy Deloach West of Benton Blvd	6600	4	B	24900	4	B	27500	4	C
Jimmy Deloach East of Benton Blvd	8100	4	B	33100	4	C	32800	4	D
Jimmy Deloach East of Crossroads Pkwy	8700	4	B	32550	4	C	32400	4	C
Jimmy Deloach West of SR 21	5400	4	B	32550	4	C	32550	4	C
I-95 North of SR 21	50200	6	B	99650	6	D	99650	6	D
I-95 South of Montieth Road	58100	6	B	113850	6	D	99650	6	D
I-95 South of Jimmy Deloach	63550	6	C	108400	6	D	113850	6	D
Benton Blvd North of Jimmy Deloach	1450	2	A	9350	2	C	23800	4	B
Benton Blvd South of Jimmy Deloach	4050	2	B	12500	2	C	22900	4	B
Highlands Blvd between Jimmy Deloach & Benton Blvd	1050	2	A	9350	2	C	30000	4	C

Source: Georgia Department of Transportation: Project Number CSMSL-0006-00(700)

Opportunity cost

For this study, opportunity cost is estimated as the value to an individual or business of the time consumed by congestion. The estimated value of time used in this study was taken from the National Cooperative Highway Research Program “*Report 463: Economic Implications of Congestion.*” These estimates of the value of time by type of travel are recommended values of travel time used by the U.S. Department of Transportation. It is also important to note that the U.S. DOT recommended values used

in this study are the midpoint of the ‘plausible range’ that U.S. DOT will accept. The values of time estimates were adjusted from 1995 dollars to 2006 dollars using the Department of Labor Consumer Price Index. Table 2 shows estimated value of time for local personal travel, intercity personal travel, and general business.

The literature on valuing travel by mode and purpose of trip indicates that the opportunity cost varies by type of travel and traveler. This is due to both the trip-specific behavior choices made and other factors such as relative comfort, convenience, and reliability. The literature indicates that drivers should be valued at about 60 percent of their wage rate and passengers should be valued at 40 percent. Furthermore, it shows that intercity travel should be valued higher at 70 percent. Business travel should be valued at 100 percent of the wage rate plus fringe benefits, because travel time in this situation is directly related to “production cost”.

Table 2
Opportunity Cost 2006\$

	Percent of Wage Rate	Hourly Earnings Rate	Value of Travel Time
Personal	50%	22.49	11.25
Intercity Personal Travel	70%	22.49	15.74
General Business	100		24.87

Although this study does not also break the opportunity cost of commuting by occupation, it is important to note that there are a different opportunity costs because of the different rates of compensation for different occupations. Table 3 below shows the average hourly wage rate for selected occupations in 1995 dollars.

Table 3
Occupation Wage Rate 1995\$

Occupation	Average hourly wage
Precision production and crafts	\$ 16.20
Transport and material moving	\$ 15.08
Executive, administrative, managerial	\$ 21.90
Technicians	\$ 17.40
Machine operators	\$ 12.25
Protective services	\$ 9.76
Helpers and laborers	\$ 11.03
Sales occupations	\$ 15.65
Professional occupations	\$ 22.39
Clerical occupations	\$ 12.64
Private household occupations	\$ 4.57

Source: NCHRP: Economic Implications of Congestion Report 463

The selected occupations generally have a lower wages than those shown in Table 2, but of key interest here is the variation in wages among the occupations. Professional and Executive occupations incur a much higher burden or opportunity cost than laborers or clerical workers. This is very significant when one considers the type of commuting patterns between Effingham County and Chatham County. Shifting patterns within the economy can affect the opportunity cost.

There seems to be some indication in the community profile data to suggest that Effingham County is attracting an increasing number of residents in the young family, starter home category. If this trend persists the average opportunity cost used in this study may partially over estimate the economic benefit. However, those with the highest opportunity cost will experience the greatest relative reduction in commuting cost, so conceivably the corridor may entice more Professional and Technical households to move to Effingham County. In this case, use of the average opportunity cost will underestimate the benefits.

It is beyond the scope of this study to measure the elasticity of the response to changes in the relative opportunity cost and for this reason the average opportunity cost is considered the best estimate of benefits to households from reduced time in travel.

Because of the location to the Savannah Port, State Road 21 is an integral part of the regional and national logistic distribution network. For this study and for the logistics segment of the traveler market, the Federal Highway Administration value of opportunity cost from the *“Highway Economic Requirement System: Technical Report,”* was used. Again, the estimated costs were inflated from 1995 dollars to 2006 dollars using the Consumer Price Index. Table 4 show the estimated cost to commercial trucking of time delays.

Opportunity costs include “production cost” which is the value of the vehicle and inventory. Some of the inventory may be perusable while other inventor is based on “Just-in-time” delivery. Hence, time involves both some loss of inventory, or shrinkage, as well as the potential that delivery delays will cost the next user of the input in terms of lost production time. Table 4 show the estimated cost to commercial trucking of time delays by labor cost, capital or vehicle cost and inventory losses.

Table 4
Opportunity Cost for Commercial Trucking 2006\$

	Labor/Fringe	Vehicle	Inventory	Total
Commercial Trucking	29.04	9.82	2.18	41.04

Construction

The estimated construction costs for Phase 1 of the proposed Effingham Parkway is 108.1 million dollars, with Phase 2 an estimated 27.4 million dollars. These estimates were prepared by Georgia DOT and were used as the estimated costs for the purposed of this analysis. Further, this study assumes that the project will be undertaken in 2015. That means purchases like Right of Way and engineering cost will likely occur within two years prior to 2015 and base paving and erosion control will occur during the project construction date. The REMI analysis used to estimate the economic impact is not sensitive to the actual timing since construction costs create only a transitory impact.

Financing

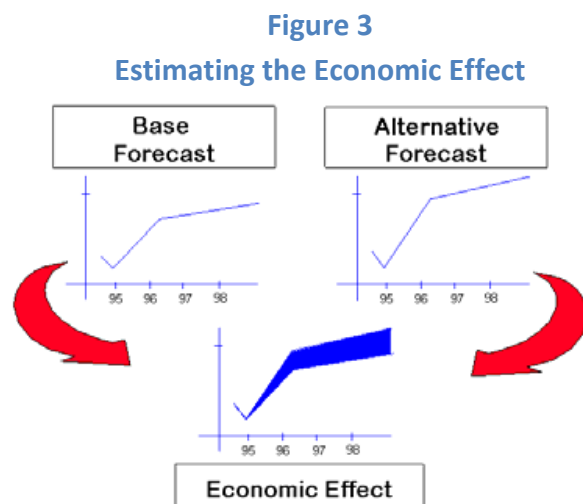
There are some alternatives for financing the 135.4 million dollar transportation project. An impact analysis will generally treat the different financing possibilities differently. For example, to the extent that funds come from outside of the region through state or Federal assistance the expenditures on construction would be a direct infusion to the local economy. Such an infusion would have an economic impact benefiting the region. However, for the purposes of this study it is assumed that there will be no external funds supporting the construction. This self financing scenario is the most stringent possible assumption to test of the cost of the project relative to the benefits.

One local option for funding the project is through a sales tax, something that the 2009 General Assembly considered. Alternatively, though not presented in this final report, a property tax is another possible funding mechanism.¹

This study picked 2011 as the start date for the tax and assumed that the tax will be collected for ten years. It is important to note the difference between the timing of the start of the tax and the start of the expenditures for construction, since the tax initially creates negative growth. Once the income removed from the income stream as savings is spent the construction impact overwhelms the drag of savings.

Economic Modeling: REMI

The model used to show the economic impact of the proposed Effingham Parkway is Regional Economic Modeling Inc. (REMI).² This model is a dynamic economic impact model that can analyze multiple policy changes across regions and overtime. Additionally, this model incorporates changing economic conditions into a dynamic model that captures preexisting growth expectations of each region. The concept of how REMI isolates the economic impact is shown in the Figure 3. As shown, there is a base forecast (the preexisting growth of the economy absent of the proposed impact), an alternative forecast (the new forecast with the proposed project), and the economic effect (an isolation of the economic impact or the difference between the base forecast and the alternative forecast). For the purpose of this study, the following tables and numbers only refer to the economic effect or the change relative to the preexisting growth.



¹ As noted the impact of funding via a property tax was estimated, but the results were not significantly different from a sales tax in a macroeconomic context. The study did not consider the relative burdens of the different impacts at the microeconomic level of analysis.

² Regional Economic Modeling, Inc, REMI is a product of REMI, Inc of Amherst, MA.

2. Findings: Community Profile/Background

Table 5 compares the community profile for Effingham County for 2007 relative to Effingham in the 2000 Census. Comparisons to the U.S. profile are also shown. As noted previously, Effingham County has been a high growth county for at least a decade. Between 2000 and 2007 there has been an estimated 29% increase in total population from 37,535 to 48,527.

First, it should be noted that Effingham County is younger than the average age in the U.S. population both in 2000 and 2007. In particular, Effingham County is significantly lower in population age 65 and older when compared to the U.S. Unlike many Georgia counties, Effingham County's percent of population by race is the same as the U.S. for African American population.

Average household and average family size in Effingham is greater than the U.S. This is probably influenced by the lower percent of the population in Effingham County that is age 65 or older. Additionally, between 2000 and 2007 there was an increase in both household size and family size in Effingham County and the increase was substantially larger than the increase in the U.S. population as a whole. This suggests that the new population moving into Effingham County is the young family segment of the population. This conclusion is strengthened by the observation that between 2000 and 2007 there has been a significant decrease in the number of owner-occupied housing units and a significant rise in the number of renter-occupied housing units. Note these are pre-recession changes in the composition of housing by ownership.

As shown in Table 5 continued, the median family income in 2000 in Effingham County was equivalent to the median family income for the U.S. However, again to suggest the increase in the presence of younger families, the median family income in Effingham County in 2007 fell relative to the U.S. by about 3,000 dollars.

Table 5
General Characteristics for Effingham County

General Characteristics	2007			2000		
	Estimate	Percent	U.S.	Number	Percent	U.S.
Total population	48,527			37,535		
Male	24,080	50%	49%	18,646	50%	49%
Female	24,447	50%	51%	18,889	50%	51%
Median age (years)	33.9	(X)	36.4	33.6	(X)	35.3
Under 5 years	3,604	7%	7%	2,857	8%	7%
18 years and over	34,807	72%	75%	26,301	70%	74%
65 years and over	4,089	8%	13%	3,016	8%	12%
One race	N	N	98%	37,145	99%	98%
White	N	N	74%	31,776	85%	75%
Black or African American	N	N	12%	4,876	13%	12%
American Indian and Alaska Native	N	N	1%	119	0%	1%
Asian	N	N	4%	170	1%	4%
Native Hawaiian and Other Pacific Islander	N	N	0%	9	0%	0%
Some other race	N	N	6%	195	1%	6%
Two or more races	N	N	2%	390	1%	2%
Hispanic or Latino (of any race)	N	N	15%	531	1%	13%
Household population	48,331			37,287	99%	97%
Group quarters population	(X)	(X)	(X)	248	70%	3%
Average household size	2.92	(X)	2.60	2.84	(X)	2.59
Average family size	3.36	(X)	3.19	3.18	(X)	3.14
Total housing units	17,983			14,169		
Occupied housing units	16,568	92%	88%	13,151	93%	91%
Owner-occupied housing units	12,846	78%	67%	10,869	83%	66%
Renter-occupied housing units	3,722	23%	33%	2,282	17%	34%
Vacant housing units	1,415	8%	12%	1,018	7%	9%

Source: U.S. Census Bureau, 2000 Summary File 1 (SF 1) and Summary File 3 (SF 3)

Source: U.S. Census Bureau, 2005-2007 American Community Survey

Explanation of Symbols:

'N' - Data for this geographic area cannot be displayed because the number of sample cases is too small.

'(X)' - The value is not applicable or not available.

Table 5 Continued
Social, Economic, and Housing Characteristics for Effingham County

Social Characteristics	2007			2000		
	Estimate	Percent	U.S.	Number	Percent	U.S.
Population 25 years and over	30,324			23,129		
High school graduate or higher	(X)	82%	84%	18,238	79%	80%
Bachelor's degree or higher	(X)	13%	27%	3,157	14%	24%
Civilian veterans (civilian population 18 years and over)	N	N	10%	4,334	17%	13%
Disability status (population 5 years and over)	7,198	16%	15%	6,195	18%	19%
Foreign born	646	1%	13%	502	1%	11%
Male, Now married, except separated (population 15 years and over)	10,712	58%	53%	8,977	65%	57%
Female, Now married, except separated (population 15 years and over)	11,076	59%	49%	8,788	61%	52%
Speak a language other than English at home (population 5 years and over)	N	N	20%	979	3%	18%

Economic Characteristics	2007			2000		
	Estimate	Percent	U.S.	Number	Percent	U.S.
In labor force (population 16 years and over)	24,962	69%	65%	18,229	66%	64%
Mean travel time to work in minutes (workers 16 years and over)	29.8	(X)	25.1	31.3	(X)	25.5
Median household income in 1999 (dollars)	51,422	(X)	50,007	46,505	(X)	41,994
Median family income in 1999 (dollars)	57,280	(X)	60,374	50,351	(X)	50,046
Per capita income in 1999 (dollars)	21,860	(X)	26,178	18,873	(X)	21,587
Families below poverty level	(X)	9%	10%	743	7%	0
Individuals below poverty level	(X)	10%	13%	3,458	9%	0

Housing Characteristics	2007			2000		
	Estimate	Percent	U.S.	Number	Percent	U.S.
Single-family owner-occupied homes	12,846			6,465		
Median value (dollars)	128,300	(X)	181,800	106,600	(X)	119,600
Median of selected monthly owner costs				(X)	(X)	
With a mortgage (dollars)	1,111	(X)	1,427	970	(X)	1,088
Not mortgaged (dollars)	336	(X)	402	256	(X)	295

Source: U.S. Census Bureau, 2000 Summary File 1 (SF 1) and Summary File 3 (SF 3)

Source: U.S. Census Bureau, 2005-2007 American Community Survey

Explanation of Symbols:

'N' - Data for this geographic area cannot be displayed because the number of sample cases is too small.

'(X)' - The value is not applicable or not available.

3. Findings: Impact of the Effingham Parkway

As indicated in the methodology section, the improvements to, or the creation of, a road that results in a decrease in congestion can have a real direct impact on businesses and households. Businesses have lower costs and therefore increased profits. For example, by reducing the time it takes to deliver a product, fewer hours of employee time are used, less vehicle time and less inventory is lost. Adding such efficiencies across a large business, or a large number of small businesses, means fewer trucks and employees are needed to do the same amount of work.

On the household side of the equation, residents will spend less time commuting to work, less fuel commuting to work and less fuel and time when producing household services. Less time and cost for commuting to work means more money and more time for all other activities. Some of the impact is indirect in that residents simply have a better quality life. However, some of the impact pays off in tangible additional expenditures that have a direct economic impact. With extra time and money households are able to spend more on recreation, education, civic efforts and a host of other direct economic activities.

The impact analysis, as presented in this study, combines the: 1) impact of self financing for the road; 2) the impact of the construction phase; 3) the impact of the benefits to business; and, the impact of the benefits to households. These impacts were placed in each appropriate time period and analyzed relative to each other and to the overall growth in the region. It is important to note that the following tables show the same impact in various ways and cannot be added together.

Findings: Output

Tables 6 and 7 show the impact of the Effingham Parkway in terms of output, the value of goods and services produced. First, note that there is a spike in 2015 that is created by the expenditures associated with the construction phase. The following discussion focuses on the post construction economies. Additionally recall that changes as shown in all of the tables are relative to the underlying growth dynamics of the economy. So all changes are the increase over what the economy will have look like if there were no road.

Effingham County is expected to experience an increased output in the amount of 47.4 million dollars by 2020, and Chatham County is expected to be even larger at 991.4 million dollars. Economic growth after 2020 is sustained to 2035. Rincon and Springfield will both enjoy an economic expansion.

In Effingham the largest portion of the impact is within the retail sector, about 12.0 million dollar increase, which is due to the residential or suburban nature of the economy. Local residents in a suburban community have a high demand for basic local retail. However, the impact on construction and manufacturing is a combined increase of 11.8 million dollars.

As a product or service is less frequently consumed by a household or is more expensive, the amount of travel time to find the right deal increases. Therefore, some of the higher end products that are provided in Chatham County experience substantial growth. These are concentrated in the professional technical businesses with a 36.0 million increase in output. Distribution and warehousing also show

substantial increases in growth in output, 42.0 million dollars in growth. Health care services and retail in Chatham County will both grow on the order of 150.0 to 160.0 million dollars.

The regional-wide impact on output in 2020 is an expected 2.1 billion dollars. Industries within Chatham County and the regional economy benefit from the proposed corridor because the reduction in operating costs simply strengthens the core sectors of the economy. For example, suppliers can move out to the hinterland to take advantage of cheaper prices, which benefits the major manufacturing plants in terms of low input cost and lower delivery cost. The more the core sectors are strengthened; there is what is called agglomeration of economies. In this case, agglomeration economies refer to the benefits from increased density of options within the labor market of knowledge, skills, and experience.

Table 6
Output Impact – Millions Fixed 2000\$

	Effingham				Springfield				Rincon			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Forestry, Fishing, Other	0.001	0.119	0.315	0.438	0.000	0.080	0.211	0.294	0.000	0.004	0.012	0.016
Mining	0.000	0.009	0.024	0.040	0.000	0.002	0.006	0.011	0.000	0.006	0.018	0.029
Utilities	-0.083	0.499	0.922	1.719	-0.031	0.189	0.349	0.652	-0.051	0.307	0.567	1.058
Construction	-0.613	41.790	7.015	7.794	-0.133	9.071	1.523	1.692	-0.303	20.650	3.466	3.852
Manufacturing	-0.051	2.039	4.789	9.283	-0.001	0.040	0.094	0.183	-0.036	1.420	3.336	6.466
Wholesale Trade	-0.077	0.797	1.536	3.124	-0.010	0.100	0.192	0.391	-0.052	0.539	1.039	2.113
Retail Trade	-0.823	7.077	11.499	22.093	-0.090	0.770	1.251	2.404	-0.643	5.525	8.978	17.249
Transp, Warehousing	-0.002	0.192	0.656	1.133	0.000	0.018	0.060	0.103	-0.001	0.124	0.423	0.730
Information	-0.010	0.128	0.387	0.772	-0.002	0.021	0.065	0.129	-0.007	0.089	0.270	0.538
Finance, Insurance	-0.108	1.362	3.434	5.901	-0.049	0.623	1.569	2.697	-0.049	0.625	1.576	2.707
Real Estate, Rental, Leasing	-0.218	2.203	3.498	4.893	-0.040	0.408	0.648	0.906	-0.138	1.401	2.224	3.111
Profess, Tech Services	-0.023	0.527	1.132	2.114	-0.006	0.143	0.306	0.572	-0.012	0.266	0.572	1.068
Mngmt of Co, Enter	-0.007	0.142	0.346	0.643	0.000	0.000	0.000	0.000	-0.004	0.071	0.173	0.322
Admin, Waste Services	-0.063	1.025	2.097	3.836	-0.013	0.216	0.441	0.807	-0.027	0.432	0.884	1.617
Educational Services	0.000	0.040	0.224	0.429	0.000	0.013	0.075	0.144	0.000	0.004	0.023	0.045
Health Care, Social Asst	-0.113	0.842	2.208	4.665	-0.069	0.516	1.351	2.855	-0.038	0.284	0.744	1.571
Arts, Enter, Rec	-0.016	0.200	0.625	1.096	-0.005	0.062	0.192	0.337	-0.008	0.101	0.316	0.556
Accom, Food Services	-0.178	1.657	3.751	6.123	-0.048	0.448	1.013	1.654	-0.111	1.035	2.343	3.824
Other Services (excl Gov)	-0.217	2.264	2.964	5.392	-0.056	0.581	0.761	1.384	-0.114	1.193	1.562	2.841
Total	-2.601	62.910	47.421	81.488	-0.553	13.298	10.109	17.213	-1.593	34.076	28.524	49.711

Table 7
Output Impact – Millions Fixed 2000\$

	Chatham				Bulloch				Regional Economy			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Forestry, Fishing, Other	-0.01	0.82	1.23	1.76	0.00	0.03	0.04	0.06	-0.03	1.55	2.64	3.25
Mining	0.00	0.06	0.12	0.18	0.00	0.00	0.00	0.00	0.00	0.20	0.58	0.78
Utilities	-0.07	2.21	3.58	5.16	-0.01	0.10	0.17	0.27	-0.30	3.60	5.81	8.21
Construction	-2.73	88.89	165.22	124.34	-0.32	2.18	5.02	5.10	-19.91	1,029.54	362.37	306.10
Manufacturing	-0.24	11.33	12.05	20.47	-0.02	0.34	0.25	0.39	-0.59	23.22	36.03	51.45
Wholesale Trade	-0.58	16.86	18.75	23.79	-0.04	0.39	0.46	0.68	-1.28	23.76	29.69	37.04
Retail Trade	-7.88	167.99	169.75	200.90	-0.83	6.56	4.60	7.63	-25.04	309.70	360.00	425.36
Transp, Warehousing	-0.22	16.99	42.22	52.45	-0.01	0.15	0.01	0.02	-0.33	23.18	59.31	73.08
Information	-0.16	4.98	6.30	8.87	-0.02	0.19	0.29	0.48	-0.33	7.02	10.62	14.82
Finance, Insurance	-0.55	24.07	19.37	27.82	-0.10	0.96	0.91	1.20	-2.08	47.26	71.29	84.69
Real Estate, Rental, Leasing	-1.36	51.80	56.10	65.08	-0.16	1.70	1.97	2.51	-5.91	93.71	120.78	144.37
Profess, Tech Services	-0.83	27.21	35.59	56.11	-0.08	1.00	1.25	2.42	-1.95	47.63	74.01	114.35
Mngmt of Co, Enter	-0.20	4.67	4.24	5.83	-0.01	0.11	0.10	0.14	-0.30	6.32	7.21	9.19
Admin, Waste Services	-1.92	51.76	65.65	101.58	-0.06	0.51	0.42	1.07	-4.46	89.20	134.50	182.87
Educational Services	-0.69	22.92	23.10	41.70	-0.04	0.39	0.37	0.61	-0.99	35.22	81.49	149.42
Health Care, Social Asst	-5.51	108.96	157.37	300.20	-0.48	3.68	5.44	12.17	-10.65	153.98	257.25	484.03
Arts, Enter, Rec	-0.68	25.72	31.54	41.43	-0.04	0.43	0.46	0.71	-2.16	48.25	99.45	139.46
Accom, Food Services	-6.49	117.46	98.90	124.60	-0.45	3.63	1.28	1.64	-14.89	197.77	252.72	345.84
Other Services (excl Gov)	-1.49	64.91	80.29	108.66	-0.30	2.02	2.21	4.09	-9.75	132.52	175.09	247.19
Total	-31.62	809.63	991.36	1,310.92	-2.97	24.37	25.23	41.17	-100.97	2,273.61	2,140.86	2,821.52

Findings: Employment

Tables 8 and 9 show the impact on employment of the combined actions of paying for the road, building the road and the associated response by households and businesses as the cost of travel is decreases.

Changes in production levels resulting from lower travel cost induce changes in the level of employment. Again, recall that changes as shown in all of the tables are relative to the underlying growth dynamics of the economy. Hence, the relatively small impact on employment that comes from the tax to pay for the road, suggest that the overall strength of the regional economy is sufficient to offset the small drag create by the tax.

As with the discussion of output growth, the initiation of the construction phase pushes employment up dramatically. As the construction phase is concluded, the regional economy and the sub-regions settle along a more moderate growth path with employment about 2,500 (see Table 9) higher for the region than it would be without the road. The gains in employment in Effingham are slightly less than half the gains for the region as a whole. The gains in Chatham are slightly more than half of the total gains for the region.

Table 8
Employment Impact

	Effingham				Springfield				Rincon			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Forestry, Fishing, Other	0	0	1	1	0	0	0	0	0	0	0	0
Mining	0	0	0	0	0	0	0	0	0	0	0	0
Utilities	0	1	1	2	0	0	1	1	0	1	1	1
Construction	-14	917	144	132	-3	210	33	30	-7	457	72	66
Manufacturing	0	6	12	16	0	0	0	0	0	5	9	11
Wholesale Trade	0	4	7	8	0	1	1	1	0	3	4	5
Retail Trade	-14	109	147	172	-2	15	21	24	-11	83	112	131
Transp, Warehousing	0	4	13	15	0	1	2	2	0	2	7	9
Information	0	1	3	3	0	0	1	1	0	1	2	2
Finance, Insurance	-1	15	38	42	0	6	16	17	-1	7	18	20
Real Estate, Rental, Leasing	-3	25	40	47	0	4	7	8	-2	16	26	30
Profess, Tech Services	-1	13	25	37	0	3	6	9	0	7	14	20
Mngmt of Co, Enter	0	1	2	2	0	0	0	0	0	0	1	1
Admin, Waste Services	-2	26	45	55	0	4	7	8	-1	11	18	22
Educational Services	0	10	54	101	0	3	18	34	0	1	6	11
Health Care, Social Asst	-3	26	67	121	-2	17	45	82	-1	7	18	33
Arts, Enter, Rec	-1	16	55	80	0	2	6	9	-1	11	37	54
Accom, Food Services	-6	56	123	180	-2	15	33	49	-4	36	79	116
Other Services (excl Gov)	-6	48	67	98	-2	13	18	26	-3	23	33	48
Public Admin	-7	19	120	244	X	X	X	X	X	X	X	X
Total	-59	1,298	963	1,355	-12	295	215	303	-31	672	457	582

*Effingham County includes the both Springfield and Rincon employment impacts.

X- denotes that data was not available

Table 9
Employment Impact

	Chatham				Bulloch				Regional Economy			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Forestry, Fishing, Other	0	1	1	2	0	0	0	0	0	2	3	3
Mining	0	0	0	0	0	0	0	0	0	0	1	1
Utilities	0	2	4	5	0	0	0	0	0	4	6	8
Construction	-3	89	165	124	0	2	5	5	-20	1,030	362	306
Manufacturing	0	11	12	20	0	0	0	0	-1	23	36	51
Wholesale Trade	-1	17	19	24	0	0	0	1	-1	24	30	37
Retail Trade	-8	168	170	201	-1	7	5	8	-25	310	360	425
Transp, Warehousing	0	17	42	52	0	0	0	0	0	23	59	73
Information	0	5	6	9	0	0	0	0	0	7	11	15
Finance, Insurance	-1	24	19	28	0	1	1	1	-2	47	71	85
Real Estate, Rental, Leasing	-1	52	56	65	0	2	2	3	-6	94	121	144
Profess, Tech Services	-1	27	36	56	0	1	1	2	-2	48	74	114
Mngmt of Co, Enter	0	5	4	6	0	0	0	0	0	6	7	9
Admin, Waste Services	-2	52	66	102	0	1	0	1	-4	89	135	183
Educational Services	-1	23	23	42	0	0	0	1	-1	35	81	149
Health Care, Social Asst	-6	109	157	300	0	4	5	12	-11	154	257	484
Arts, Enter, Rec	-1	26	32	41	0	0	0	1	-2	48	99	139
Accom, Food Services	-6	117	99	125	0	4	1	2	-15	198	253	346
Other Services (excl Gov)	-1	65	80	109	0	2	2	4	-10	133	175	247
Public Admin	-1	34	138	245	-1	2	7	17	-8	60	289	557
Total	-32	844	1,129	1,556	-4	26	33	58	-109	2,334	2,429	3,379

It can be noted that gains in employment also bring gains in personal and real disposable income. Post construction, region-wide real disposable income is 203.2 million higher than it will be without the road. The split in this gain in real disposable income by sub-region is approximately the same as the split in employment.

Table 10
Personal Income and Real Disposable Personal Income

	2012	2015	2020	2035
Personal Income (Bil Nom \$)	-0.0042	0.2549	0.3828	0.8109
Real Disp Pers Inc (Bil Fixed 2000\$)	-0.0133	0.1517	0.2032	0.3345

Findings: Capital Stock

Table 11 shows the impact of the combined road building policies on the value of residential and business capital stock.

The value of homes and the value of the property owned by businesses are dependent on two other variables. When incomes and population increase there is an increased demand for housing so the optimal or estimated need for housing and business expansion are adjusted accordingly. Since it takes time to build new homes and to build/expand businesses, the adjustment in the actual value of the stock lags behind changes in demand. When the road is completed in 2020 the actual value of the residential capital stock in Effingham County will be 45.0 million dollars higher than it will be with no road. The actual value of businesses in Effingham County in 2020 will be nearly 26.0 million dollars higher than without the road.

In Chatham County the actual value of the residential capital stock is increased by more than the impact in Effingham, but the impact on business value is much less. Differences in the Effingham and Chatham impacts persist through 2035 with both counties seeing large changes in the value of residential capital stock, and Effingham business experience significantly higher gains than Chatham County.

Table 11
Business and Residential Capital Stock – Millions Fixed 2000\$

	Effingham				Springfield				Rincon			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Residential Actual	-2.39	0.14	45.06	167.62	-0.53	0.03	9.91	36.88	-1.36	0.08	25.68	95.54
Residential Optimal	-20.40	104.24	139.25	249.78	-4.49	22.93	30.64	54.95	-11.63	59.42	79.37	142.38
Business Actual	-0.30	3.05	25.91	84.14	-0.07	0.67	5.70	18.51	-0.17	1.74	14.77	47.96
Business Optimal	-2.99	72.86	102.55	144.02	-0.66	16.03	22.56	31.69	-1.71	41.53	58.45	82.09
	Chatham				Bulloch				Regional Economy			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Residential Actual	-0.16	7.95	77.14	235.09	-0.03	0.30	2.32	8.88	-2.70	9.51	135.18	450.46
Residential Optimal	-1.54	161.47	219.06	347.10	-0.24	4.75	6.98	13.92	-23.29	291.95	397.51	670.18
Business Actual	-0.14	2.06	19.60	51.05	-0.02	0.10	0.92	3.06	-0.58	5.79	53.93	163.50
Business Optimal	-1.74	62.34	69.00	88.72	-0.25	2.92	3.48	5.59	-6.43	158.23	205.64	282.37

Findings: Labor Force/Population

In REMI, as employment opportunities change, labor is assumed to migrate toward areas with high levels of job opportunities and away from lower wage, lower job opportunity areas. Hence, a region's population and the age of the population are the combined effect of natural growth and economic migration. Tables 12 and 13 show the impacts of the combined processes on the population and labor force of the region.

The initial impacts on population in 2020 are population increases in Effingham and Chatham County each with a gain about 2,000. However, lowering travel costs and increasing business opportunity in Effingham County results in a much more significant increase over time in Effingham County population compared to Chatham. Additionally, with a younger population structure in Effingham County some of the increase in population is due to the higher birth and lower death rate.

**Table 12
Population Impact**

	Effingham				Springfield				Rincon			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Ages 0-14	-37	102	652	1,245	-10	27	170	324	-19	51	326	622
Ages 15-24	-31	112	390	735	-8	29	101	191	-16	56	195	367
Ages 25-64	-81	221	1,438	2,885	-21	57	374	750	-41	110	719	1,442
Ages 65 & Older	0	-2	25	293	0	-1	7	76	0	-1	13	147
Total	-150	432	2,505	5,158	-39	112	651	1,341	-75	216	1,253	2,579

	Chatham				Bulloch				Regional Economy			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Ages 0-14	-3	129	565	932	0	5	19	38	-43	256	1,334	2,427
Ages 15-24	-2	117	317	569	0	5	12	26	-36	251	772	1,441
Ages 25-64	-6	280	1,217	2,114	-1	11	45	106	-93	554	2,900	5,521
Ages 65 & Older	0	0	26	226	0	0	1	10	0	-3	56	571
Total	-12	526	2,124	3,841	-2	21	77	180	-171	1,059	5,062	9,960

**Table 13
Labor Force Impact**

	Effingham				Springfield				Rincon			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Ages 16-24	-16	146	304	416	-4	38	79	108	-8	73	152	208
Ages 25-54	-69	340	1,342	2,176	-18	88	349	566	-35	170	671	1,088
Ages 55-64	-15	60	224	353	-4	16	58	92	-7	30	112	177
Ages 65& Older	-5	41	86	124	-1	11	22	32	-3	21	43	62

	Chatham				Bulloch				Regional Economy			
	2012	2015	2020	2035	2012	2015	2020	2035	2012	2015	2020	2035
Ages 16-24	-2	120	250	321	0	5	8	12	-21	287	603	810
Ages 25-54	-7	338	1,170	1,693	-1	12	37	72	-82	736	2,728	4,257
Ages 55-64	-1	72	203	294	0	2	5	10	-17	144	461	710
Ages 65& Older	-1	72	106	102	0	2	4	5	-7	125	214	255

4. Summary and Conclusions

First, it should be noted that examining the impact of the proposed corridor as a self financed development is the most stringent possible test of cost and benefit. With an estimate cost of 135.4 million dollars internalized by the region, there is a short-term drag on the region's economy. So the key question to be asked is, are enough of the benefits of the road captured locally to justify the investment? The answer to that question is a very strong yes. In 2020 alone, Gross Regional Output will be 2,140.0 million dollars higher if the road is built compared to the no build scenario. In that same year, real disposable income will be 230.0 million dollars higher if the road is built compared to the no build scenario.

The second question that seems central to the discussion is who gets the greatest benefit? Our conclusion is that depends on which of the impact measures one chooses to focus. For example, if one focused on growth in Gross County Output, Chatham County is the biggest winner. However, if one focuses on the gain in jobs over the no build grow in employment is roughly evenly split between Chatham, 1,130 jobs in 2020, and Effingham, 960 jobs in 2020. Additionally, gains in real disposable income are also roughly evenly split. Hence, in terms of the things that matter to the typical household both regions basically share the benefits.

It should also be noted that in terms of the growth in the actual value of business capital stock, the winner is actually Effingham County, an increase in 2020 of 26.0 million dollars compared to 20.0 million in Chatham County. The spread in that difference increases with time. By 2035 the increase in actual business capital stock in Effingham County is an expected 84.0 million dollars compared to only 51.0 million in Chatham County.