



PELLISSIPPI STATE
COMMUNITY COLLEGE

An Analysis of the College's Economic and Social Impact

2017-2022

November 2022

PELLISSIPPI STATE COMMUNITY COLLEGE

A Major Partner in the Economic Vitality of the Knoxville Metropolitan Area

Acknowledgments

Special thanks go to the following Pellissippi State Community College staff for their invaluable assistance with this annual economic impact study:

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The College System of Tennessee

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EXECUTIVE SUMMARY

Pellissippi State Community College has served the Knoxville metropolitan area since 1974, experiencing significant student enrollment growth as indicated in Figure 1. The College's enrollment for fall semester, 2022 was a credit headcount of 8,452 students and a credit FTE of 5,270 students, maintaining Pellissippi State as the largest community college in Tennessee.

This 35th annual analysis of the direct economic impact of Pellissippi State on Knox and Blount counties measures the College's five-year (2017-2022) economic impact on the community in terms of (1) business volume, (2) employment and (3) individual income. Not included in the study is the indirect economic impact that naturally results from having a trained and educated work force available to local business and industry.

The report is based on a standard model of economic impact modified for community colleges. The economic impact model is based on a circular cash flow model as illustrated in Figure 2. The model uses conservative income and employment multipliers, as illustrated in Figure 3, to determine economic impact.

The study reveals that more than \$433 million in "new," non-local, and state/federal revenues flowed into the area during 2017-2022 as a result of the College's presence. These external revenues represented 66% of the total College revenues for the period. The College also received more than \$225 million in local revenues during this period, for a grand total of more than \$658 million in revenues.

The following economic impact resulted from College expenditures of these revenues:

1. Local **business volume** generated by College expenditures during 2017-2022 was **\$743 million**, with \$583 million being due to non-local revenues, as shown in Figure 4. Annual business volume generated ranged from \$131 million to \$163 million.

2. Local **full-time-equivalent jobs** created and sustained during 2017-2022 as a result of the College's presence totaled **50,619 jobs**, including the College's own 2,874 jobs over that same period. Of this total, 39,387 jobs were the result of non-local revenues, as shown in Figure 5. Annual full-time jobs generated ranged from 9,044 to 11,045 jobs.
3. Local **individual income** generated by College expenditures during 2017-2022 totaled **\$782 million**, using the more conservative Type I multiplier, with \$626 million being due to non-local revenues, as shown in Figure 6. Annual Type I individual income generated ranged from \$137 million to \$173.5million.

In summary, the combined five-year direct economic impact on the community represents **\$1.5 billion**, or an average of **\$305 million** per year. Of this amount, \$1.2 billion, or \$242 million per year, is due to the infusion of "new" external/non-local revenues. This impact would likely not have occurred without the presence of Pellissippi State in the area.

It is significant to note that for every \$1 of local revenues coming to Pellissippi State, there was \$3.29 of local business volume and from \$3.47 to \$3.73 of individual income generated, for a total return on investment (ROI) of \$6.76 to \$7.02 on the local dollar!

In addition to the above local economic impacts, there are significant individual economic benefits that accrue to students earning two-year associate degrees. The U.S. Bureau of Labor Statistics estimates in 2022 that the average associate degree graduate in the U.S. earns about \$20,970 more per year than someone whose education stopped after high school. Over a typical 40-year career, that would translate to \$838,800 in increased lifetime earnings. Applying that figure to the 2021-22 class of 1,414 Pellissippi State associate degree graduates results in an estimate of more than **\$1.1 billion** that this class alone could potentially earn over their high

school diploma counterparts over their work lifetime, plus an increase of about **\$2.7 million** in annual local, state and federal tax payments.

Research on unemployment rates also shows lower unemployment rates for people with college degrees than for those with high school degrees or less. Finally, there are many demonstrated social benefits to increased levels of education that accrue to the broader society, in addition to the more personal economic benefits.

This study continues to document the significant force Pellissippi State has become in the economic and social vitality of the Knoxville metropolitan area.

INTRODUCTION

Pellissippi State Community College has served the Knoxville metropolitan area since 1974, experiencing significant enrollment growth as indicated in Figure 1. The enrollment for fall semester, 2022 for the College was a credit headcount of 8,452 students and a credit FTE of 5,270 students, maintaining Pellissippi State as the state's largest community college.

This report is the 35th annual analysis of the rolling five-year economic impact of Pellissippi State on the Knoxville metropolitan area. The primary counties affected are Knox and Blount, with approximately 86% of the College's expenditures being made, on the average, in those two counties.

The analysis measures the direct, explicit economic impact of Pellissippi State on the community. It does not include the implicit, intangible economic impact that results from having a trained and educated work force available for local business/industry or from expansion and recruitment of business/industry as a result of the College's presence. The analysis is based on the Caffrey model of economic impact, originally developed in 1968 through the American Council of Education. The model has been adapted for application to community colleges.¹

The model uses conservative income and employment multipliers to determine Pellissippi State's economic impact on the following:

1. Business volume--the total amount of local business volume generated as a result of the College's direct and indirect expenditures.
2. Employment--the total number of local full-time-equivalent jobs generated and sustained by the College's direct and indirect expenditures.

¹Norval L. Wellsfry, "The Los Rios Community College District: A Major Partner in the Sacramento Area's Economic Vitality," 1988 (unpublished paper).

3. Individual income--the total amount of personal income earned by local households as a result of the College's direct and indirect expenditures.

Two additional components of the College's impact on the community are included in this study: (1) an estimate of the projected increase in lifetime earning capacity of the most recent class of Pellissippi State graduates compared to high school graduates, and (2) a description of the broader societal benefits of increased levels of higher education.

METHODOLOGY

The economic impact model is based on a circular cash flow model as illustrated in Figure 2. The community is treated as a semi-closed economic system, with money entering the system through Pellissippi State from both local and external or "new" sources.

The local sources of revenue include student tuition/fees, local grants/contracts, private scholarships, gifts, and other miscellaneous local revenue. External or "new" revenues include state appropriations for both operating and capital purposes, federal/state student financial aid revenues, as well as state/federal grants and contracts.

Pellissippi State circulates its revenues through the local economy via expenditures for employee salaries and benefits, construction and maintenance of facilities, and local purchases of equipment and supplies. These expenditures are then re-circulated through the local economy, increasing in value, and having a multiplier or secondary impact as local businesses and households make expenditures and generate jobs. Figure 3 illustrates the multiplier principle.

Economic impact on the community is measured on two levels: (1) in relationship to total expenditures from all revenue sources and (2) in relationship to expenditures from only those external or "new" revenues that would likely not have occurred without Pellissippi State's

presence in the economy. The following College revenues and expenditures for the five-year period 2017-2022 were incorporated into an Excel spreadsheet template containing the model.

REVENUES						
SOURCES	2017-18	2018-19	2019-20	2020-21	2021-22	TOTAL
GENERAL						
STATE APPROPRIATION	30,527,187	33,100,009	34,973,338	35,817,025	38,375,800	172,793,359
LOCAL PROPERTY TAX						
ENROLLMENT FEES	38,760,495	38,926,778	38,386,171	32,814,941	31,855,030	180,743,415
TOTAL	69,287,682	72,026,787	73,359,509	68,631,966	70,230,830	353,536,774
FEDERAL	267,026	296,423	250,879	1,147,358	831,210	2,792,896
OTHER STATE	23,532	51,484	35,618	30,336	68,495	209,465
COUNTY						
LOCAL	2,909,309	3,286,036	2,916,591	7,925,042	10,944,705	27,981,683
OTHER LOCAL						
SPECIAL REVENUE						
FEDERAL	3,310,449	3,181,027	3,102,678	11,206,167	11,509,607	32,309,928
STATE	26,666,208	3,179,153	1,579,382	3,130,834	7,252,579	41,808,156
LOCAL	286,776	604,254	557,245	439,786	680,470	2,568,531
OTHER						
STUDENT FINANCIAL AID						
FEDERAL	19,376,267	19,108,993	21,035,287	19,233,998	23,319,277	102,073,822
STATE	13,246,594	17,837,818	18,246,003	16,602,091	15,128,693	81,061,199
LOCAL	6,886,203	2,120,245	1,851,855	1,366,677	1,965,764	14,190,744
OTHER						
TOTAL REVENUE	142,260,046	121,692,220	122,935,047	129,714,255	141,931,630	658,533,198
LOCAL	48,842,783	44,937,313	43,711,862	42,546,446	45,445,969	225,484,373
NON-LOCAL	93,417,263	76,754,907	79,223,185	87,167,809	96,485,661	433,048,825
LOCAL %	34.3%	36.9%	35.6%	32.8%	32.0%	34.2%
NON-LOCAL %	65.7%	63.1%	64.4%	67.2%	68.0%	65.8%

EXPENDITURES						
DATA	2017-18	2018-19	2019-20	2020-21	2021-22	TOTAL
WAGES	38,920,214	40,163,812	41,482,718	40,811,666	43,032,966	204,411,376
NON-SAL. EXPEN.	27,158,204	28,348,192	28,923,207	33,891,750	34,352,622	152,673,977
CAPITAL EXPEN.	3,415,574	6,643,487	14,595,080	25,014,429	15,683,131	65,351,701
STU. FIN. AID	39,509,064	39,067,056	41,133,145	37,202,766	40,413,734	197,325,766
NET WAGES	29,190,161	30,122,859	31,112,039	30,608,750	32,274,725	153,308,530
NON-SALARY, LOCAL	22,405,518	23,387,258	23,861,646	27,960,694	28,340,913	125,956,029
CAPITAL, LOCAL	2,817,849	5,480,877	12,040,941	20,636,904	12,938,583	53,915,153
FTE COLLEGE JOBS	591	585	588	568	542	2,874
NON-LOCAL REVENUE %	65.7%	63.1%	64.4%	67.2%	68.0%	65.8%
TOTAL EXPENDITURES	109,003,056	114,222,547	126,134,150	136,920,611	133,482,450	619,762,814
LOCAL EXPENDITURES	93,922,591	98,058,050	108,147,770	116,409,110	113,967,950	530,505,480

LOCAL EXPENDITURES (NEW)	75,240,550	76,274,433	84,319,463	90,429,327	90,416,173	416,679,94 5
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For the five-year period, \$433.0 million in non-local revenues was brought into the service area, along with \$225.5 million in local revenues, for a combined total of \$658.5 million in revenues. The five-year average was 65.8% non-local and 34.2% local revenues.

RESULTS

Business Volume Impact

The local business volume impact generated by Pellissippi State expenditures is shown below:

	BUSINESS VOLUME IMPACT					
	2017-18	2018-19	2019-20	2020-21	2021-22	TOTAL
BUSINESS VOLUME	131,491,628	137,281,270	151,406,878	162,972,758	159,555,137	742,707,672
BUSINESS VOLUME (NEW)	105,336,770	106,784,206	118,047,248	126,601,058	126,582,642	583,351,924

The annual business volume impact of total College expenditures ranged from \$131.5 million to \$163 million, with a five-year total of \$742.7 million. The impact of external or “new” College revenues ranged from \$105.3 million to \$126.6 million, with a five-year total of \$583.4 million. Figure 4 graphs the relationship between local revenues and both total and “new” business volume generated by the College’s presence.

Employment Impact

The local employment impact in terms of full-time-equivalent (FTE) jobs created and sustained by Pellissippi State expenditures is shown below:

EMPLOYMENT IMPACT

	2017-18	2018-19	2019-20	2020-21	2021-22	TOTAL
EMPLOYMENT	9,044.03	9,410.22	10,321.30	11,044.82	10,799.12	50,619
EMPLOYMENT (NEW)	7,159.74	7,233.68	7,967.68	8,520.33	8,505.91	39,387

Pellissippi State’s own annual FTE jobs ranged from 542 to 591 during this period, yet the total annual employment created and sustained by College expenditures ranged from 9,044 to 11,045 jobs, with a five-year total of 50,619 jobs, including the College’s own 2,874 FTE jobs over that period. The number of FTE jobs created annually by external or “new” revenues ranged from 7,160 to 8,520 jobs, with a five-year total of 39,387 jobs. Figure 5 graphs the relationship between the College’s full-time jobs and both total and “new” full-time-equivalent jobs generated and sustained by the College’s presence.

Individual Income Impact

The local impact of Pellissippi state’s expenditures on personal income is calculated using two different multipliers to produce a range of impact, shown below as Type I and Type II. The Type I multiplier is the more conservative measure.

INDIVIDUAL INCOME IMPACT

	2017-18	2018-19	2019-20	2020-21	2021-22	TOTAL
TYPE I MULTIPLIER	137,293,010	143,550,951	159,595,809	173,526,017	168,493,697	782,459,484
TYPE II MULTIPLIER	148,399,282	155,012,097	171,433,318	185,172,034	180,773,584	840,790,314
TYPE I (NEW)	112,529,540	114,336,744	126,972,238	136,736,273	135,886,555	626,461,350
TYPE II (NEW)	119,822,646	121,565,630	134,600,698	144,562,382	144,234,469	664,785,823

The total Type I impact of College expenditures on personal income, using the more conservative multiplier, ranged from \$137.3 million to \$173.5 million, with a five-year total of \$782.5 million. The impact of external or “new” revenues ranged from \$112.5 million to \$136.7 million, with a five-year total of \$626.5 million. Figure 6 graphs the relationship between local revenues and both total and “new” Type I personal income generated by the College’s presence.

In summary, the combined five-year direct economic impact on the community (business volume plus individual income) represents **\$1.53 billion**, or an average of **\$305 million** per year, plus the creation of 50,619 jobs. Of this amount, \$1.2 billion, or \$242 million per year, was due to the infusion of “new,” external/non-local revenues. This impact would likely not have occurred without the presence of Pellissippi State in the area.

It is significant to note that for every \$1 of local revenues coming to Pellissippi State, there was \$3.29 of local business volume and from \$3.47 to \$3.73 of individual income generated, for a total return on investment of \$6.76 to \$7.02 on the local dollar!

ECONOMIC BENEFITS OF HIGHER EDUCATION

Many national and state research studies have demonstrated the economic value of increased levels of education. There is a clear relationship established between increased levels of education and increased annual incomes and lifetime earnings.

As a 2007 study of the impact of Middle Tennessee higher education institutions states, “It appears that knowledge, either in the form of human capital or technological advancement, has become the common denominator in much economic growth and regional competitiveness literature.”¹

Several national research studies have been completed that specifically focus on the economic benefits of two-year associate degree programs conferred by community colleges. As one such study says, “While community colleges serve many goals and missions, their occupational purposes are central, and virtually all their students enroll in order to enhance their employment, either directly or by later transferring to 4-year colleges.”²

This same compilation of a dozen national studies of the effect of associate degrees on employment outcomes concluded that “completing associate degrees generally enhances wages,

employment, and earnings by significant amounts...”³ Another such study entitled “Education Pays: The Benefits of Higher Education for Individuals and Society” conducted by the College Board, further concludes that “there is a correlation between higher levels of education and higher earnings for all racial/ethnic groups and for both men and women.”⁴

Most studies of this nature contrast the annual and lifetime earnings potential of associate degree graduates compared with high school diploma holders. Lifetime earnings generally mean the cumulative earnings over a 40-year work life from about age 25-64.

The literature indicates a range of lifetime earnings ratios between associate degree graduates and high school diploma holders, generally in the range of 20-30% higher, at a minimum, for associate degree graduates.⁵ This income gap between high school and college graduates has also increased significantly over time.⁶

In terms of average annual earnings by associate degree and high school diploma holders, the literature also contains a range of findings. The College Board study referenced earlier cites an average annual earnings differential of \$6,800, (\$37,600 for associate degree holders vs. \$30,800 for high school diploma holders),⁷ while a more recent U.S. Census Bureau study indicates an even greater difference of \$11,033 (\$32,602 vs. \$21,569).⁸

A 2007 study conducted by the University of Tennessee Center for Business and Economic Research found that, over the seven-year period from 1997 to 2005, associate degree graduates in Tennessee earned \$33,326 on average one year after graduation, growing to \$38,952 four years later and to \$42,921 after seven years, for an average annual growth rate of 4.3%.⁹

A 2013 study revealed even higher first year earnings (\$38,945) for Tennessee associate degree completers. Also significant was the finding that Tennessee associate degree completers had higher first year earnings than did bachelor’s degree completers.¹⁰

The U.S. Bureau of Labor Statistics estimates in 2021 that the average associate degree

graduate in the U.S. earns about \$20,970 more per year than someone whose education stopped after high school (\$59,260 vs \$38,290). Over a typical 40-year career, that would translate to about **\$838,800** in projected increased lifetime earnings.¹¹

ECONOMIC BENEFITS APPLIED TO PELLISSIPPI STATE GRADUATES

During 2017-2022, Pellissippi State graduated 7,585 students with two-year associate degrees, as seen below:

Associate Degree Graduates

2017-18	1,458
2018-19	1,460
2019-20	1,665
2020-21	1,588
2021-22	<u>1,414</u>
Total	7,585

Graduates typically either transfer on to four-year institutions to continue their education or they seek immediate employment. The job placement rates for those Pellissippi State career/technical graduates who seek employment have been tracked as follows:

Job Placement Rates

2017	91%
2018	84%
2019	85%
2020	80%
2021	82%

An estimate of projected lifetime earnings of a class of Pellissippi State associate degree graduates can be gained using average national figures. The U.S. Bureau of Labor Statistics study referenced earlier found a difference of about \$838,800 in lifetime earnings between associate degree graduates and high school diploma holders. Taking the 1,414 graduates making

up the class of 2021-22, for example, and applying the \$838,800 excess lifetime earnings of associate degree graduates over high school diploma holders, one arrives at a figure of **\$1.2 billion** that this class alone could potentially earn over their high school diploma counterparts.

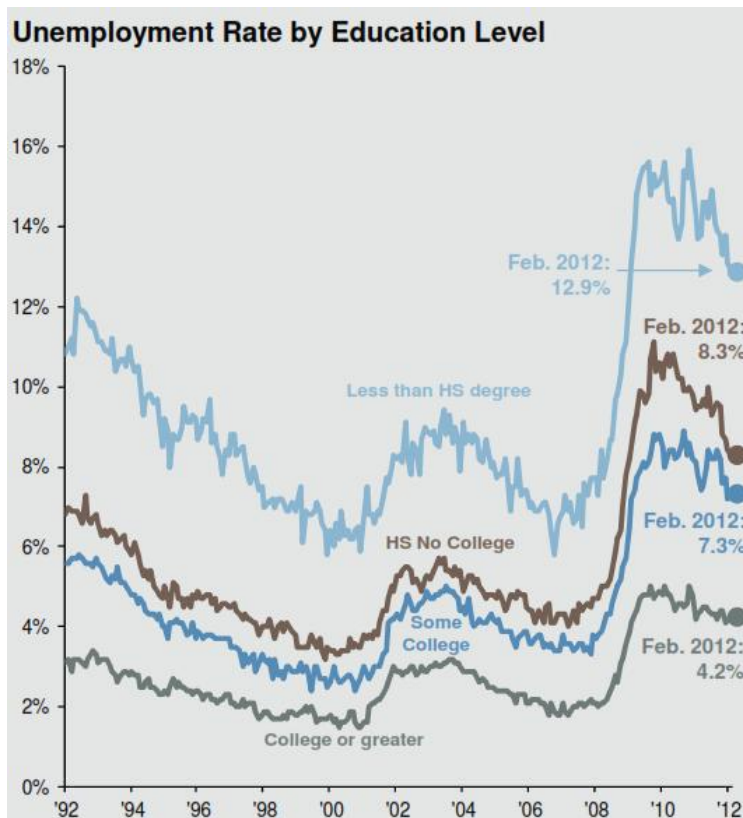
Pellissippi State typically draws the substantial majority of its students from its two-county primary service area. For example, in the fall semester of 2022, about 78% of the credit headcount students came from Knox and Blount County.

The 2007 University of Tennessee study referenced earlier found that those earning associate degrees were much more likely to stay and work in Tennessee than were other degree-earners. In fact, after one year, 73.3% of associate degree earners were working in Tennessee, compared with 62.4% of bachelor's degree earners and 40% of doctoral degree earners.¹²

Assuming the majority of Pellissippi State's graduates have remained in the area, the economic impact of each succeeding graduating class over their earnings lifetime has been and will continue to be an enormous contributor to local economic activity.

Along with the individual economic benefits associated with greater wages and earnings, there are also corresponding societal economic benefits that come from increased levels of local, state and federal tax payments. The 2004 College Board study indicates, for example, average annual tax payments of \$8,600 for associate degree holders vs. \$6,700 for high school degree holders, a difference of \$1,900 per year.¹³ Applying that figure just to the 1,414 Pellissippi State associate degree graduates in 2021-22 would generate an estimate of **\$2,686,600** in increased annual tax payments to local, state and federal governments, plus the "multiplier effect" of these taxes as they are circulated in the local, state and national economy.

Yet another indicator of the economic impact of education can be seen by comparing data on unemployment rates. A 2012 study of unemployment rates shows the following:



Source: BLS, FactSet, J. P. Morgan Asset Management, 2012

A consistent trend is seen since 1992, with highest unemployment rates for people with less than a high school degree, followed by people with a high school degree but no college, then those with some college, and lowest for those with a college degree.

SOCIAL BENEFITS

Many studies of the value of higher education identify broader benefits to society at large, in addition to the considerable economic benefits to the individual. Some of these societal benefits of increased levels of higher education include:

1. Increased likelihood of attending a 4-year college. Students who enroll in public two-year colleges increase their likelihood of attending a four-year institution by 5-10%,¹⁴
2. Lower levels of unemployment as educational attainment increases,¹⁵

3. Reduced poverty rates, particularly for single parent and married couple families with children,¹⁶
4. Less dependence on social “safety-net” programs, resulting in less demand on public budgets,¹⁷
5. Improved perceptions of personal health, along with reduced smoking rates¹⁸, lower rates of alcohol abuse and health-related absenteeism, and longer life spans,¹⁹
6. Reduced levels of crime and incarceration rates, along with reductions in victim costs (It costs about \$24,532 per year to maintain a prisoner in Tennessee, whereas it only costs the state about \$6,739 per year to educate an FTE student at Pellissippi State),²⁰
7. Higher cognitive skill levels and greater ability to persist at tasks for young children of mothers with more education,²¹
8. Higher levels of participation in civic and volunteer activities, including voting and blood donation,²² and
9. Increased levels of home ownership.²³

These broader societal benefits tend to apply similarly across all gender, racial and ethnic student groups, as did the economic benefits.

CONCLUSIONS

The results of this economic and social impact study clearly demonstrate that Pellissippi State Community College continues to be a major contributor to the economic bases of Knox and Blount Counties. In addition to the more implicit impact of a community college on the improved productivity and quality of life achieved through increased education, the explicit

economic impact noted here is significant. This economic impact is expressed here in terms of jobs created, business volume generated and personal income earned.

Additionally, it has been demonstrated that a two-year graduate can expect to earn significantly more over their work lifetime than can a high school diploma holder, as well as to pay considerably more local, state and federal taxes. Also, research indicates lower unemployment rates for people with college degrees than with high school degrees. Finally, there are demonstrated social benefits to increased levels of education that accrue to the broader society, in addition to the more personal economic benefits.

As Pellissippi State continues to grow in enrollment and/or budget, its economic and social impact on the Knoxville metropolitan area will increase similarly. The College continues to be a major partner and force in the economic vitality of the Knoxville metropolitan area.

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Figure 1
Credit Headcount Enrollment
By Fall Terms

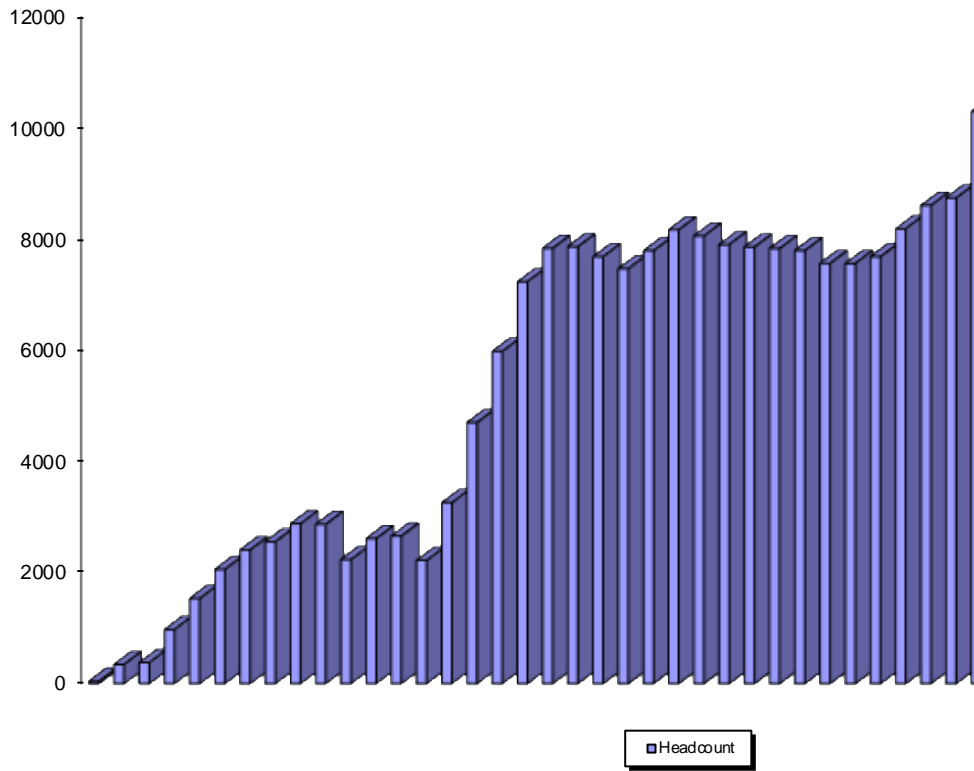
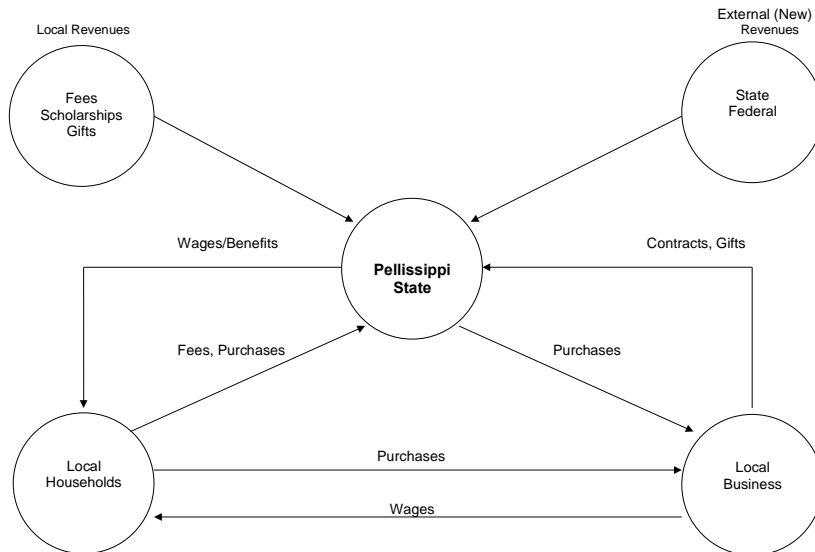


Figure 2
Circular Cash Flow Model



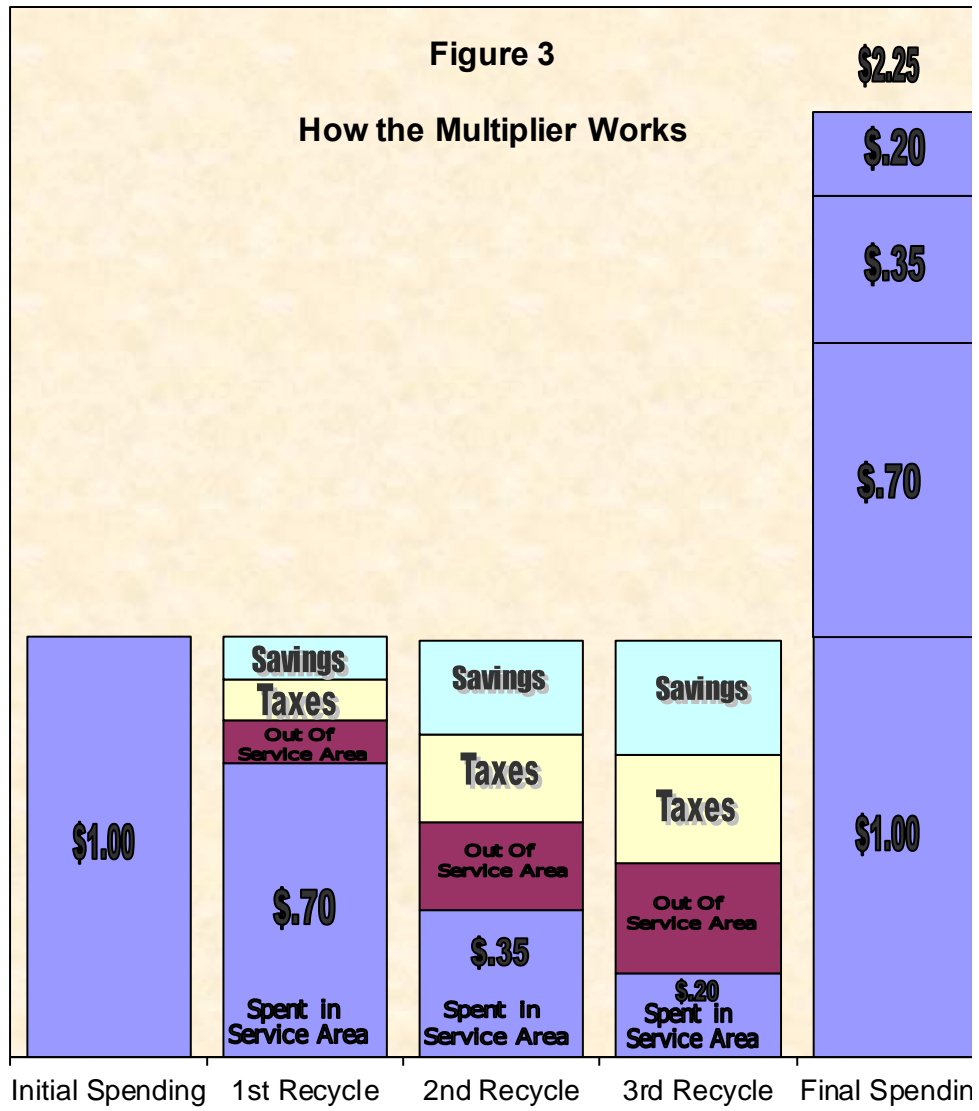


Figure 4
Business Volume Impact

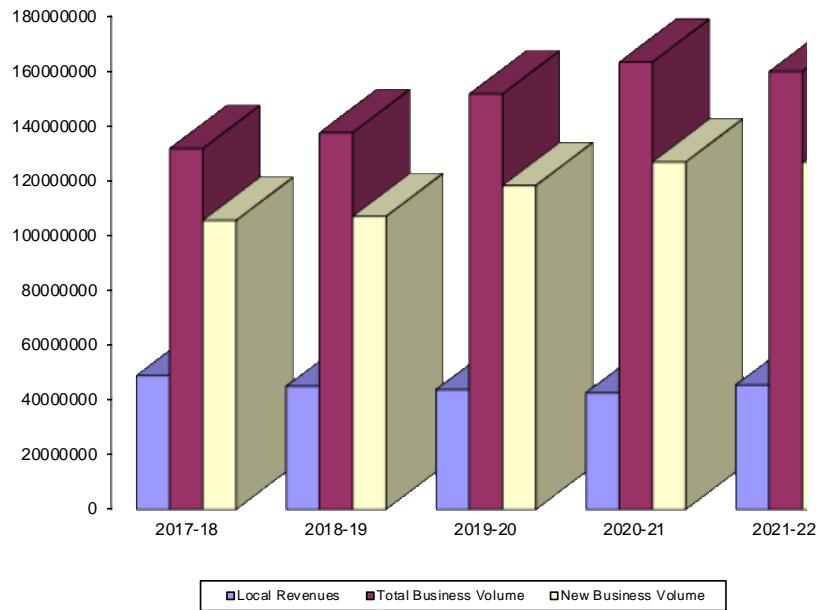


Figure 5
Employment Impact

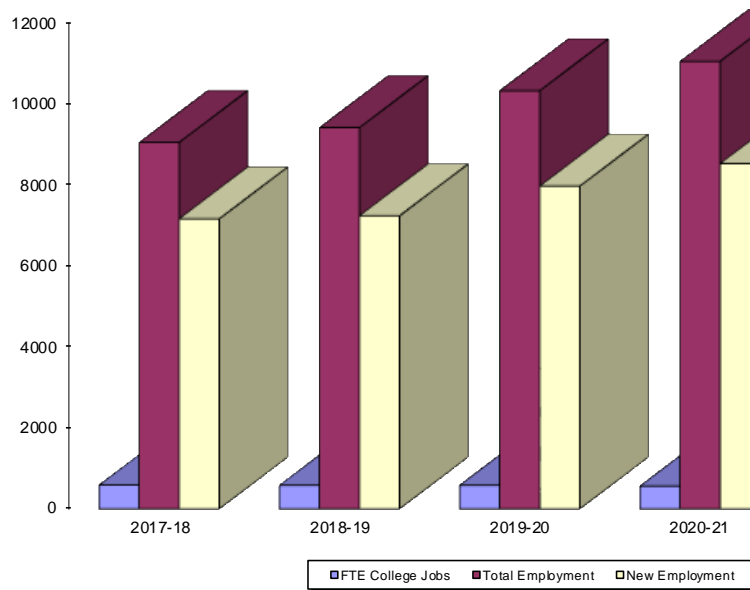


Figure 6

Individual Income Impact

