

# **Butler County Regional Transit Authority Economic Impact and Sales Tax Forecast**

**June 1, 2023**

*Final Report*

# Table of Contents

- Executive Summary .....2
  - Economic and Fiscal Impact.....2
  - Job Access.....3
  - Butler County Household Contributions to Local Sales Tax .....3
  - Sales Tax Forecast .....3
  - Incremental Sales Tax Burden for Butler County Personas.....4
- Introduction .....5
- Economic and Fiscal Impact Methodology .....6
  - Economic Impact .....6
  - Fiscal Impact .....6
- Butler County Regional Transit Authority Economic Impact Analysis.....7
  - Capital Expenditures.....7
  - Operations Expenditures .....8
  - Total Economic Impact.....9
- Job Access Analysis ..... 10
- Butler County Sales Tax ..... 12
  - Butler County Household Contributions ..... 12
  - Sales Tax Forecast ..... 14
  - Incremental Sales Tax Burden for Butler County Personas..... 17
- Conclusion..... 19

# Executive Summary

## Economic and Fiscal Impact

Approximately \$20.5 million in economic output will directly generated in Butler County between 2023 and 2033 by the capital expenditures of the Butler County Regional Transit Authority (BCRTA). This will result in further indirect economic output of \$9.4 million for the businesses supported by the capital expenditures of BCRTA. The capital expenditures of BCRTA will directly support 80 jobs with earnings of \$5.9 million. Indirectly, the capital expenditures of BCRTA will support 52 jobs with earnings of approximately \$3.0 million.

The total tax revenue generated by the capital expenditures of BCRTA between 2023 and 2033 will be comprised of nearly \$211,500 in state earnings tax revenue, more than \$163,100 in local earnings tax revenue, approximately \$71,200 in state sales tax revenue, and \$9,300 in sales tax revenue for Butler County.

The operations expenditures of BCRTA will directly generate \$46.7 million in economic output in Butler County between 2023 and 2033. An additional \$20.6 million in economic output will be indirectly generated in Butler County due to the inter-industry linkages. Between 2023 and 20233, the operations of BCRTA will create a total of \$67.3 million in economic output. BCRTA will directly employ 1,078 individuals in Butler County between 2023 and 2033, or an average of 98 employees per year. The individuals directly employed by BCRTA will have earnings of \$33.8 million between 2023 and 2033. The operations expenditures made by BCRTA during this 11-year period will indirectly support an additional 165 jobs with earnings of \$8.8 million.

The operations expenditures of BCRTA, will directly and indirectly, create more than \$2.1 million in tax revenue for state and local governments between 2023 and 20233, or an average of approximately \$192,400 annually.

In total, BCRTA will directly generate \$67.2 million in economic output in Butler County, which will lead to further indirect economic output of \$30.0 million. The capital and operations expenditures of BCRTA will directly support 1,158 jobs with earnings of \$39.7 million. On average, 105 jobs with earnings of \$3.6 million will directly supported by BCRTA each year. Indirectly, the capital and operations expenditures of BCRTA will support an additional 217 jobs with \$11.7 million in earnings in Butler County. Over this 11-year period, the capital and operations expenditures of BCRTA will generate \$97.2 million in economic output and support 1,375 jobs with earnings of \$51.4 million.

The planned capital and operations expenditures of BCRTA will generate a total of \$2.6 million in state and local tax revenue between 2023 and 2033. The capital and operations expenditures of BCRTA will directly generate more than \$692,000 in state earnings tax revenue, nearly \$784,500 in local earnings tax revenue, approximately \$457,000 in sales tax revenue for the State of Ohio, and an estimate \$59,600 in sales tax revenue for Butler County. The operations and capital expenditures of BCRTA will indirectly lead to an additional \$253,800 in state earnings tax revenue, \$214,600 in local earnings tax revenue, \$97,000 in state sales tax revenue, and 12,700 in sales tax revenue for Butler County.

## **Job Access**

Under BCRTA's current route system, approximately 20,750 jobs can be accessed within a ¼-mile of a BCRTA stop within Butler County. The wages associated with these transit-accessible jobs total more than \$1.1 billion, or an average of \$54,663 per job.

When examining the distribution of jobs within a ¼-mile buffer of BCRTA's current stops, the Cities of Hamilton and Middletown are the clear hub of the current network. The southwest and west portions of Butler County, including West Chester and Liberty Townships, display substantial job density, however the majority of these jobs are located outside of the ¼-mile buffer of a stop along the current BCRTA route network.

The Educational Services Industry has the most jobs that can be accessed, under the current route system, within a ¼-mile of BCRTA stops (6,441 jobs), followed by the Health Care and Social Assistance Industry (2,389 jobs), and the Public Administration Industry (2,256 jobs).

## **Butler County Household Contributions to Local Sales Tax**

Currently, BCRTA is not able to obtain additional federal funding to support increased service until the Agency secures additional local funding. In order to generate additional local funding that can be leveraged for additional federal funding, BCRTA is contemplating a levy to increase the local sales tax rate.

Butler County households are estimated to have generated approximately \$21.9 million in local sales tax revenue in 2021. Households in the \$100,000 to \$149,999 income range provided the most local sales tax to Butler County. These households also comprised the largest group with 26,862 households in the County.

The amount of sales tax revenue that accrued to Butler County totaled approximately \$53.5 million. Considering Butler County households generated \$21.9 million in sales tax revenue for Butler County, it can be concluded that spending subject to sales tax made by local households represent approximately 41.0 percent of Butler County's local sales tax revenue.

## **Sales Tax Forecast**

The Economics Center conducted a sales tax forecast of Butler County's monthly and annual sales tax revenues including estimated impacts on collections based on two scenarios. The baseline county rate is 0.75 percent, or three-quarters of one percent, and represents the baseline scenario. The alternative scenario models a marginal increase of 0.25 percentage points, resulting in a total county rate of 1.00 percent. An increase to the Butler County sales tax rate of 0.25 percentage points will result in additional sales tax revenues ranging from \$19.16 million in 2023 to \$20.45 million in 2032. In total, increasing the local sales tax rate from 0.75 percent to 1.00 percent will generate approximately \$198.38 million in additional sales tax revenue during the forecast period.

## **Incremental Sales Tax Burden for Butler County Personas**

The Economics Center identified five personas that collectively represented more than half (56.1%) of Butler County residents 18 years of age and older. The five personas identified were an employed individual with a bachelor's degree or higher; an individual with family income less than or equal to 175.0 percent of the poverty threshold; an employed individual between the ages of 18 to 25; a retired individual aged 65 years and older; and an employed individual that is transit dependent. On average, the incremental, annual sales tax burden for these five personas ranged from \$12.66 for employed individuals between the ages of 18 and 25 and \$27.84 for employed individuals with a bachelor's degree or higher.

## Introduction

The Butler County Regional Transit Authority (BCRTA) provides public transit services that connect individuals to jobs, education, health care, government services, and shopping through its fixed-route system, BGO, a curb-to-curb on-demand service, and paratransit services. The BCRTA is currently undertaking a short-range planning study to evaluate existing services, facilities, vehicles, as well as the potential for changes to the delivery of services.

In addition to connecting individuals in Butler County to jobs, education, shopping, medical services, and government services, BCRTA also benefits the local economy through its capital and operations expenditures and the resulting economic and fiscal impacts.

Upon the conclusion of the short-range planning study and input from the community at-large, it may be necessary for BCRTA to invest in service enhancements and improved amenities. However, these improvements will likely require additional funding. Under BCRTA's current funding model, the agency is not able to secure additional federal funding for transit-related improvements. In order to leverage additional federal funding, BCRTA will need to secure additional local funding. Of the possible local funding mechanisms available to BCRTA, an increase to the local sales tax rate would enable the Agency to collect local revenue from all consumption spending subject to the local tax rate. This potential funding option would capture spending within Butler County from individuals that do not reside within the County.

The analysis provided within this report details the economic and fiscal impacts of the capital and operations expenditures associated with BCRTA's current route system. Additionally, a geospatial analysis was completed to measure job access within ¼-mile of current BCRTA stops. Further, a forecast of the current local sales tax rate of 0.75 percent and an increased sales tax rate of 1.00 percent was completed.

# Economic and Fiscal Impact Methodology

## Economic Impact

An economic impact analysis measures the effect of an organization's expenditures on its surrounding community. The total economic impact is the sum of the direct and indirect impacts. The direct impact is the amount spent directly by the organization that is retained within the local economy. The indirect impact is the additional economic impact resulting from the increased demand, income, and jobs within other industries, or the inter-industry linkages. The direct impact has ripple effects due to increased household income and spending, which are referred to as induced impacts. Induced impacts are reported within indirect impacts for the entirety of this report.

BCRTA provided expenditure data for the budgeted capital and operations expenditures between 2023 and 2033. All expenditure data from BCRTA are presented in 2023 dollars.

Expenditure data were then factored for economic leakage to represent only the economic impact of money retained in Butler County. Economic leakage refers to the percentage of purchases for products and services that cannot be met immediately within the local economy, and thus must be imported from outside the local economy. Leakage estimates were obtained from Lightcast, a third-party provider of labor market data.

The post-leakage expenditures were used in an input-output model that uses multipliers to represent the inter-industry linkages and household economic relationships. Multipliers are used to determine the total economic impact when applied to the direct impact. This means that multipliers reflect how many additional dollars will be spent in a local economy by other businesses and households for every dollar spent by an organization. These multipliers are location and industry specific and were obtained from Lightcast.

## Fiscal Impact

The fiscal impact analysis estimates the subsequent impacts on state and local tax revenue of the capital and operations expenditures of BCRTA. State and local earnings tax revenue were calculated for the earnings, directly and indirectly, supported, as well as the state and local sales tax revenue resulting from the spending of those earnings. It was assumed that the current tax rates would remain unchanged in the future.

## Earnings Tax

State earnings tax revenue accrues to the state of residence of the worker, whereas local earnings tax revenue accrues to the municipality of the workplace. All workers were assumed to reside in the State of Ohio. All local earnings tax revenue generated from the direct jobs supported accrued to the City of Hamilton. A blended local earnings tax rate for Butler County was estimated and applied to the indirect jobs supported by the capital and operations expenditures of BCRTA.

## Sales Tax

Sales tax revenue accrues to the State of Ohio as well as to Butler County. The Economics Center assumed that the individuals, directly and indirectly, supported by the capital and operations expenditures of BCRTA spend their earnings in the local economy. To estimate the sales tax revenue generated, the Bureau of Labor Statistics' Consumer Expenditure Survey for the Midwest was utilized to determine what portion of average annual earnings were used to make taxable purchases. Taxable spending was then factored for economic leakage, and the applicable sales tax rates were applied.

## Butler County Regional Transit Authority Economic Impact Analysis

In addition to the benefits created for riders, BCRTA also generates impacts on the Butler County economy through capital and operations expenditures. The economic impact that can be attributed to BCRTA is ascertained by examining the capital and operations expenditures made by BCRTA, as well as examining the employment and earnings generated in Butler County resulting from the spending that occurs in the local economy due to BCRTA.

### Capital Expenditures

Capital expenditures refer to expenses for revenue vehicles, facilities improvements, equipment, and other amenities. These expenditures are associated with a specific project and are generally one-time expenditures as opposed to ongoing. During the 11-year period between 2023 and 2033, BCRTA plans to make \$47.4 million of capital expenditures.

After accounting for economic leakage, approximately \$20.5 million in economic output will directly generated in Butler County between 2023 and 2033 by the capital expenditures of BCRTA. This will result in further indirect economic output of \$9.4 million for the businesses supported by the capital expenditures of BCRTA. The capital expenditures of BCRTA will directly support 80 jobs with earnings of \$5.9 million. Indirectly, the capital expenditures of BCRTA will support 52 jobs with earnings of approximately \$3.0 million. As detailed in Table 1, the capital expenditures of BCRTA are projected to generate a total of \$29.9 million in economic output and support 132 jobs with \$8.9 million in earnings in Butler County between 2023 and 2033.

**Table 1: Economic Impact of Capital Expenditures, 2023 – 2033 (2023\$)**

Impact Type	Output	Employment	Earnings
Direct	\$20,456,348	80	\$5,936,096
Indirect	\$9,394,944	52	\$2,970,087
<b>Total</b>	<b>\$29,852,292</b>	<b>132</b>	<b>\$8,906,183</b>

*Source: Economics Center calculations using data from BCRTA.*

Between 2023 and 2033, the direct earnings supported by the capital expenditures of BCRTA will generate more than \$145,500 in state earnings tax revenue, approximately \$109,000 in local earnings tax revenue, \$46,600 in state sales tax revenue, and \$6,100 in sale tax revenue



for Butler County. Additionally, the indirect earnings supported by the capital expenditures of BCRTA are projected to create approximately \$66,000 in state earnings tax revenue, \$54,400 in local earnings tax revenue, nearly \$25,000 in sales tax revenue for the State of Ohio, and \$3,200 in sales tax revenue for Butler County over the 11-year period. As detailed in Table 2, the capital expenditures planned to be made by BCRTA between 2023 and 2033 will support a total of approximately \$455,000 in state and local tax revenue. The total tax revenue generated by the capital expenditures of BCRTA between 2023 and 2033 will be comprised of nearly \$211,500 in state earnings tax revenue, more than \$163,100 in local earnings tax revenue, approximately \$71,200 in state sales tax revenue, and \$9,300 in sales tax revenue for Butler County.

**Table 2: Fiscal Impact of Capital Expenditures, 2023 – 2033 (2023\$)**

Impact Type	State Earnings Tax Revenue	Local Earnings Tax Revenue	State Sales Tax Revenue	County Sales Tax Revenue	Total Tax Revenue
Direct	\$145,553	\$108,727	\$46,632	\$6,082	<b>\$306,994</b>
Indirect	\$65,918	\$54,401	\$24,584	\$3,207	<b>\$148,110</b>
<b>Total</b>	<b>\$211,471</b>	<b>\$163,128</b>	<b>\$71,216</b>	<b>\$9,289</b>	<b>\$455,104</b>

Source: Economics Center calculations.

### Operations Expenditures

The operations expenditures of BCRTA represent the day-to-day expenses such as salaries, benefits, and administrative expenses, among other items. Between 2023 and 2033, BCRTA plans to spend \$58.3 million on operations. This equates to average annual operations expenditures of \$5.3 million.

After accounting for economic leakage, the operations expenditures of BCRTA will directly generate \$46.7 million in economic output in Butler County between 2023 and 2033, as detailed in Table 3. An additional \$20.6 million in economic output will be indirectly generated in Butler County due to the inter-industry linkages. Between 2023 and 2033, the operations of BCRTA will create a total of \$67.3 million in economic output. BCRTA will directly employ 1,078 individuals in Butler County between 2023 and 2033, or an average of 98 employees per year. The individuals directly employed by BCRTA will have earnings of \$33.8 million between 2023 and 2033. The operations expenditures made by BCRTA during this 11-year period will indirectly support an additional 165 jobs with earnings of \$8.8 million between 2023 and 2033. In total, the operations expenditures of BCRTA, will directly and indirectly, support 1,243 jobs with earnings of \$42.5 million between 2023 and 2033. The average annual impact of the operations expenditures of BCRTA will be approximately \$6.1 million in economic output, 113 jobs, and \$3.9 million in earnings in Butler County.

**Table 3: Economic Impact of Operations Expenditures, 2023 – 2033 (2023\$)**

Impact Type	Output	Employment	Earnings
Direct	\$46,701,516	1,078	<b>\$33,786,076</b>
Indirect	\$20,601,817	165	<b>\$8,745,241</b>
<b>Total</b>	<b>\$67,303,333</b>	<b>1,243</b>	<b>\$42,531,317</b>

Source: Economics Center calculations using data from BCRTA.

Table 4 details the tax revenue generated by the operations expenditures of BCRTA between 2023 and 2033. The individuals directly employed by BCRTA will generate approximately \$547,000 in state earnings tax revenue, \$676,000 in local earnings tax revenue, nearly \$411,000 in sales tax revenue for the State of Ohio, and \$53,500 in sales tax revenue for Butler County. An additional \$188,000 in state earnings tax revenue, \$160,000 in local earnings tax revenue, \$72,400 in state sales tax revenue, and approximately \$9,500 in county sales tax revenue will be indirectly generated as a result of the planned operations expenditures of BCRTA between 2023 and 2033. The operations expenditures of BCRTA will, directly and indirectly, create more than \$2.1 million in tax revenue for state and local governments between 2023 and 2033, or an average of approximately \$192,400 annually.

**Table 4: Fiscal Impact of Operations Expenditures, 2023 – 2033 (2023\$)**

Impact Type	State Earnings Tax Revenue	Local Earnings Tax Revenue	State Sales Tax Revenue	County Sales Tax Revenue	Total Tax Revenue
Direct	\$546,544	\$675,722	\$410,477	\$53,541	<b>\$1,686,284</b>
Indirect	\$187,896	\$160,180	\$72,385	\$9,441	<b>\$429,902</b>
<b>Total</b>	<b>\$734,440</b>	<b>\$835,902</b>	<b>\$482,862</b>	<b>\$62,982</b>	<b>\$2,116,186</b>

Source: Economics Center calculations.

**Total Economic Impact**

Table 5 details the total economic impact of the capital and operations expenditures of BCRTA projected to occur in Butler County between 2023 and 2033. BCRTA will directly generate \$67.2 million in economic output in Butler County, which will lead to further indirect economic output of \$30.0 million. The capital and operations expenditures of BCRTA will directly support 1,158 jobs with earnings of \$39.7 million. On average, 105 jobs with earnings of \$3.6 million will directly supported by BCRTA each year. Indirectly, the capital and operations expenditures of BCRTA will support an additional 217 jobs with \$11.7 million in earnings in Butler County. Over this 11-year period, the capital and operations expenditures of BCRTA will generate \$97.2 million in economic output and support 1,375 jobs with earnings of \$51.4 million. This equates to an average annual impact in Butler County of more than \$8.8 million in economic output, 125 jobs, and \$4.7 million in earnings.

**Table 5: Total Economic Impact of BCRTA Expenditures, 2023 – 2033 (2023\$)**

Impact Type	Output	Employment	Earnings
Direct	\$67,158,864	1,158	\$39,722,172
Indirect	\$29,996,761	217	\$11,715,328
<b>Total</b>	<b>\$97,155,625</b>	<b>1,375</b>	<b>\$51,437,500</b>

Source: Economics Center calculations using data from BCRTA.

The planned capital and operations expenditures of BCRTA will generate a total of \$2.6 million in state and local tax revenue between 2023 and 2033, as shown in Table 6. The capital and operations expenditures of BCRTA will directly generate more than \$692,000 in state earnings tax revenue, nearly \$784,500 in local earnings tax revenue, approximately \$457,000 in sales tax revenue for the State of Ohio, and an estimate \$59,600 in sales tax revenue for Butler County. The operations and capital expenditures of BCRTA will indirectly lead to an

additional \$253,800 in state earnings tax revenue, \$214,600 in local earnings tax revenue, \$97,000 in state sales tax revenue, and 12,700 in sales tax revenue for Butler County. On average, the capital and operations expenditures of BCRTA will have an annual fiscal impact of approximately \$233,800 between 2023 and 2033.

**Table 6: Fiscal Impact of Operations and Capital Expenditures, 2023 – 2033, (2023\$)**

<b>Impact Type</b>	<b>State Earnings Tax Revenue</b>	<b>Local Earnings Tax Revenue</b>	<b>State Sales Tax Revenue</b>	<b>County Sales Tax Revenue</b>	<b>Total Tax Revenue</b>
Direct	\$692,097	\$784,449	\$457,109	\$59,623	<b>\$1,993,278</b>
Indirect	\$253,814	\$214,581	\$96,969	\$12,648	<b>\$578,012</b>
<b>Total</b>	<b>\$945,911</b>	<b>\$999,030</b>	<b>\$554,078</b>	<b>\$72,271</b>	<b>\$2,571,290</b>

Source: Economics Center calculations.

## Job Access Analysis

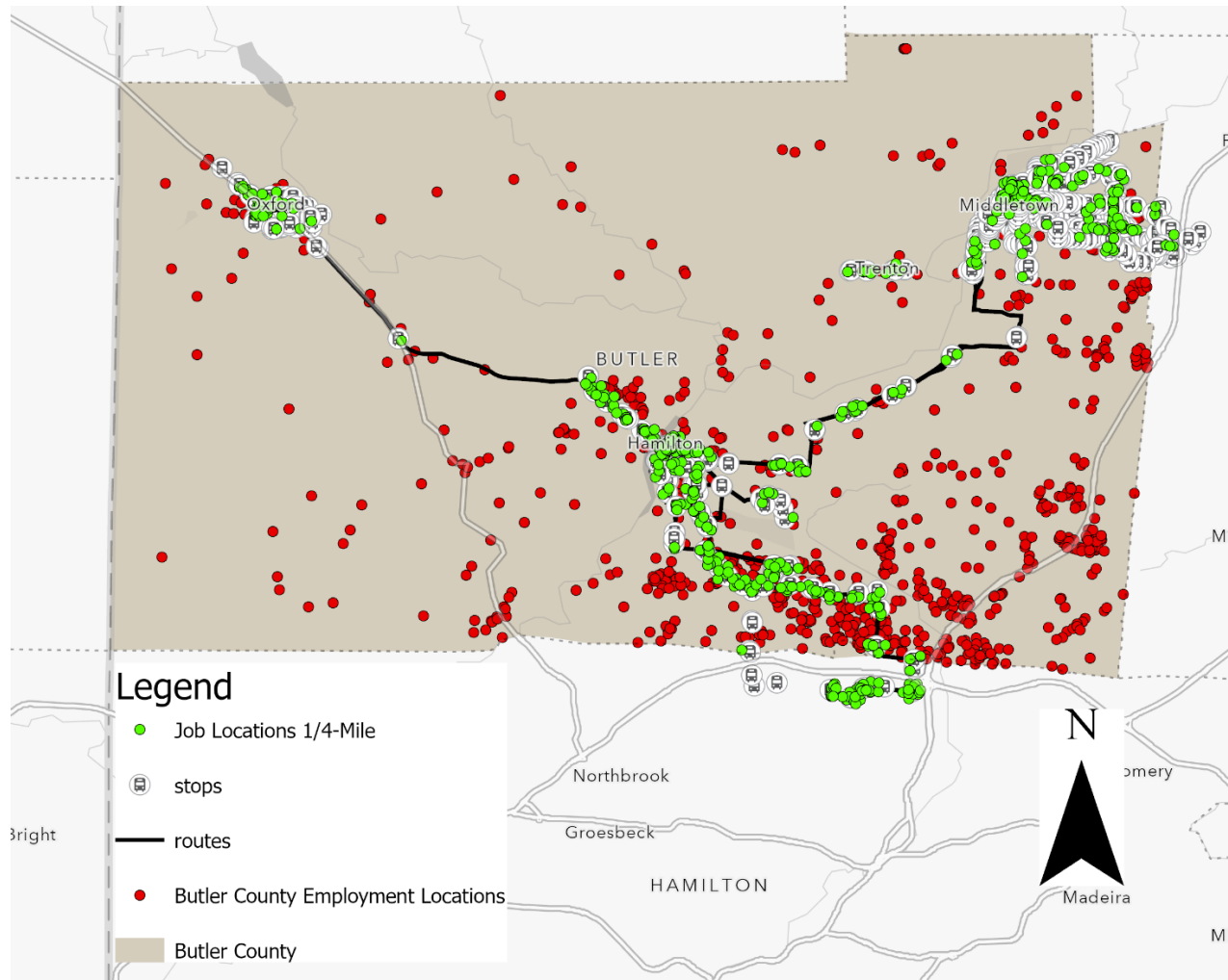
To contextualize job access, this section discusses the geospatial relationship between the current BCRTA route system stops and employment. Job access is defined as being within ¼-mile of an existing BCRTA bus stop. Using employment, wage, and location data from the Quarterly Census of Employment and Wages received from the State of Ohio, commonly known as ES-202<sup>1</sup>, a geospatial analysis was conducted to evaluate the proximity of existing BCRTA bus stops to Butler County businesses. For the purposes of calculating proximity, a ¼-mile buffer was generated around existing BCRTA bus stops. The businesses that are within this defined pedestrian-shed, or walking distance, of an existing BCRTA stop fall within the ¼-mile buffer.

When examining the distribution of jobs within a ¼-mile buffer of BCRTA’s current stops, the Cities of Hamilton and Middletown are the clear hub of the current network, as shown in Figure 1. The southwest and west portions of Butler County, including West Chester and Liberty Townships display substantial job density, however the majority of these jobs are located outside of the ¼-mile buffer of a stop along the current BCRTA route network.

Under BCRTA’s current route system, approximately 20,750 jobs can be accessed within Butler County. The wages associated with these transit-accessible jobs total more than \$1.1 billion, or an average of \$54,663 per job.

<sup>1</sup> ES-202 data collected by the State of Ohio does not cover all classes of workers. Certain classifications within the ES-202 data have been omitted from this analysis, including those businesses filing data for multiple establishment locations in the aggregate, and those that filed with the State of Ohio but did not specify the establishment location.

**Figure 1: BCRTA Job Access ¼-Mile**



Source: Economics Center analysis using ES-202 data from the State of Ohio and BCRTA.

Table 7 displays transit-accessible job access by industry in Butler County. The Educational Services Industry has the most jobs that can be accessed, under the current route system, within a ¼-mile of BCRTA stops (6,441 jobs), followed by the Health Care and Social Assistance Industry (2,389 jobs), and the Public Administration Industry (2,256 jobs). It is worth noting that while the most jobs that can be accessed within a ¼-mile of a BCRTA stop occur in the Education Services Industry, it is likely due to BCRTA's service in the City of Oxford and proximity to Miami University. The Real Estate Rental and Leasing and Utilities Industries have the smallest share of the jobs that are transit accessible under BCRTA's current system, each at 0.3 percent.

**Table 7: Transit-Accessible Jobs by Industry**

NAICS	Industry	Jobs	Wages (2022\$)	Share of Transit-Accessible Jobs
11	Agriculture, Forestry, Fishing, and Hunting	ins. data	ins. data	ins. data
21	Mining, Quarrying, and Oil and Gas Extraction	ins. data	ins. data	ins. data
22	Utilities	61	\$4,035,715	0.3%
23	Construction	498	\$30,474,360	2.4%
31-33	Manufacturing	1,986	\$138,678,363	9.6%
42	Wholesale Trade	985	\$64,221,654	4.7%
44-45	Retail Trade	1,505	\$51,348,336	7.3%
48-49	Transportation and Warehousing	ins. data	ins. data	ins. data
51	Information	ins. data	ins. data	ins. data
52	Finance and Insurance	469	\$31,395,544	2.3%
53	Real Estate and Rental and Leasing	53	\$2,469,923	0.3%
54	Professional, Scientific, and Technical Services	175	\$13,929,224	0.8%
55	Management of Companies and Enterprises	ins. data	ins. data	ins. data
56	Administrative and Support and Waste Management and Remediation Services	985	\$31,222,892	4.7%
61	Educational Services	6,441	\$414,543,140	31.0%
62	Health Care and Social Assistance	2,389	\$121,771,926	11.5%
71	Arts, Entertainment, and Recreation	386	\$6,585,013	1.9%
72	Accommodation and Food Service	1,588	\$26,129,063	7.7%
81	Other Services, except Public Administration	610	\$16,614,641	2.9%
92	Public Administration	2,256	\$158,980,365	10.9%
	<b>Total</b>	<b>20,752</b>	<b>\$1,134,369,763</b>	<b>100%</b>

Source: Economics Center analysis of ES-202 data received from the State of Ohio.

## Butler County Sales Tax

### Butler County Household Contributions

Currently, BCRTA is not able to obtain additional federal funding to support increased service until the Agency secures additional local funding. Of the mechanisms available to BCRTA to generate increased local funding that can be leverage for additional federal funding, is an increase to the local sales tax rate. An increase to the local sales tax rate would enable BCRTA to collect revenue from all spending subject to sales tax, including from non-County residents. To understand the portion of Butler County sales tax revenue currently paid by Butler County households, the Economics Center utilized data from the 2021 American Community Survey (ACS), 5-year estimates and the Midwest Consumer Expenditure Survey. The 2021 ACS 5-

year data provided data on the number of households in Butler County by income range and the Midwest Consumer Expenditure Survey offered household consumption by spending category and household income range. Further, the Economics Center controlled for economic leakage, or the portion of household spending in Butler County that is estimated to occur outside of the County. Controlling for economic leakage enabled the Economics Center to include only the portion of Butler County household spending that is estimated to be retained within Butler County. Not all household spending is subject to sales tax, and therefore, spending categories such as *Food at home; Shelter; Utilities, fuels, and public services; Health insurance, Medical services; Education; and Personal insurance, and pensions* were excluded from the analysis.

Table 8 details the amount of Butler County sales tax revenue generated by household income ranges. As shown in the Table, Butler County households are estimated to have generated approximately \$21.9 million in local sales tax revenue in 2021. Households in the \$100,000 to \$149,999 range provided the most local sales tax to Butler County. These households also comprised the largest group with 26,862 households in the County.

**Table 8: Butler County Tax Revenue Generated by Butler County Households, (2021\$)<sup>2</sup>**

Number of Households	Household Income Range	Share of Household Income Spent on Taxable Purchases in Butler County	Total Taxable Spend in Butler County	Butler County Sales Tax Revenue (0.75%)
12,002	Less than \$15,000	1.2036 <sup>3</sup>	\$112,446,154	\$843,346
10,287	\$15,000-\$29,999	0.4233	\$95,220,882	\$714,157
10,573	\$30,000-\$39,999	0.5723	\$134,558,606	\$1,009,190
16,288	\$40,000-\$49,999	0.3067	\$223,346,314	\$1,675,097
24,718	\$50,000-\$69,999	0.2659	\$389,927,004	\$2,924,453
19,003	\$70,000-\$99,999	0.2423	\$382,884,116	\$2,871,631
26,862	\$100,000-\$149,999	0.2121	\$689,960,356	\$5,174,703
12,288	\$150,000-\$199,999	0.1898	\$398,045,180	\$2,985,339
10,573	\$200,000 and above	0.1517	\$486,499,418	\$3,648,746
<b>142,594</b>				<b>\$21,846,660</b>

Source: Economics Center calculations using data from the 2021 American Community Survey, 5-Year Estimates and the Midwest Consumer Expenditure Survey.

The amount of sales tax revenue that accrued to Butler County during 2021 totaled approximately \$53.5 million. Considering Butler County households generated \$21.9 million in sales tax revenue for Butler County, it can be concluded that spending subject to sales tax made by local households represent approximately 41.0 percent of Butler County's local sales tax revenue.

<sup>2</sup> Household income from the ACS 2021 5-year data are in 2021 dollars and 2021 is also the last year for which complete data are available from the Ohio Department of Taxation regarding tax distribution reports.

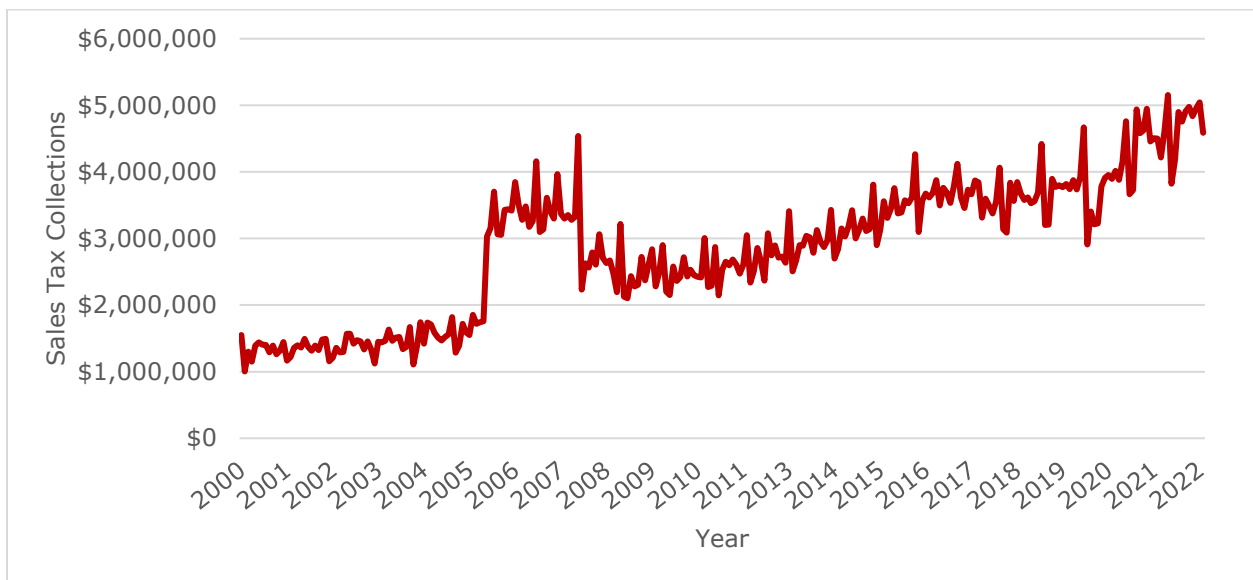
<sup>3</sup> The Share of household income spent on taxable purchases exceeds 100 percent due to households in this income range accessing and utilizing public assistance benefits.

## Sales Tax Forecast

The Economics Center conducted a sales tax forecast of Butler County’s monthly and annual sales tax revenues including estimated impacts on collections based on two scenarios. The baseline county rate is 0.75 percent, or three-quarters of one percent, and represents the baseline scenario. The alternative scenario models a marginal increase of 0.25 percentage points, resulting in a total county rate of 1.00 percent.

Figure 1 shows the historical monthly sales tax collections in Butler County from January 2000 to November 2022. During this time period, Butler County’s rate of collections changed twice, once in October 2005 from 0.50 percent to 1.00 percent and again in January 2008 from 1.00 percent to 0.75 percent.

**Figure 2: Butler County Monthly Sales Tax Collections, 2000 – 2022<sup>4</sup> (Nominal\$)**

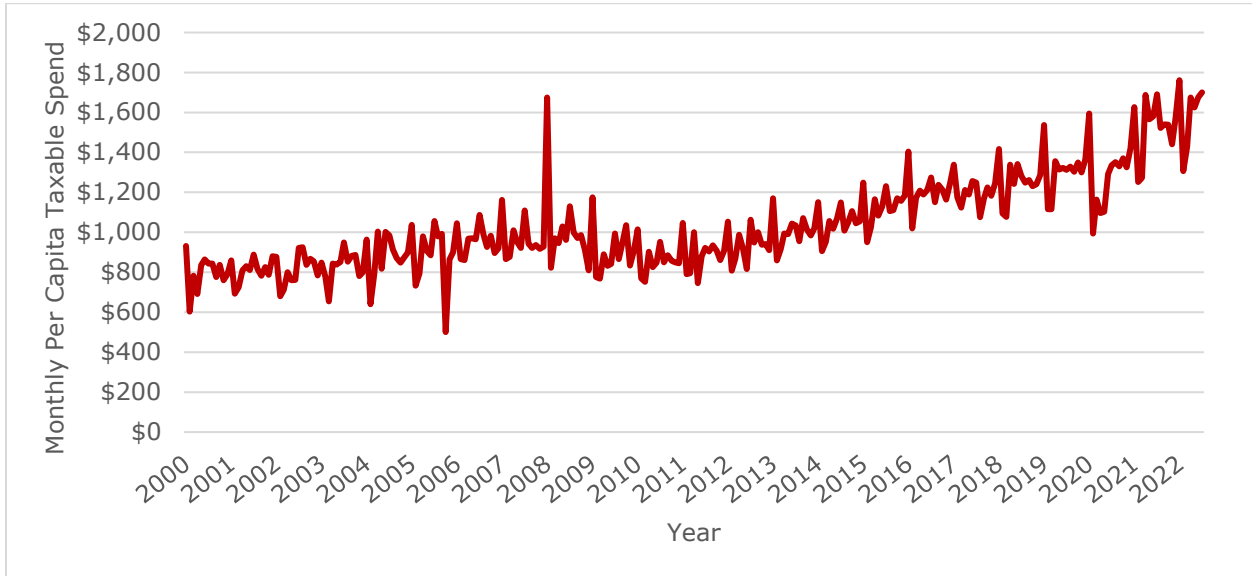


Source: Ohio Department of Taxation.

The change in tax rate from 0.50 percent to 1.00 percent in 2005 contributed to a large increase in monthly collections followed by a decrease when the rate moved down from 1.00 percent to 0.75 percent in 2008. However, as Figure 3 demonstrates, the average taxable monthly spend per capita largely remained consistent throughout this time period.

<sup>4</sup> Data through November 2022.

**Figure 3: Butler County Per Capita Monthly Taxable Spend, 2000 – 2022<sup>5</sup>  
(Nominal\$)**



Source: Ohio Department of Taxation and Economics Center calculations.

Notable variances in the per capita monthly taxable spend<sup>6</sup> data at first seem to be associated with the changes in the tax rate. However, this could result from either a lag or collections or revisions to the amount disbursed to Butler County from the State of Ohio. The Economics Center also controlled for changes in County revenues regarding the Medicaid Health Insurance Corporation changes from 2010 to 2017.

Table 9 shows the baseline in tax collections historically as well as the forecasted collection for the baseline rate and the proposed rate changes through 2032. The monthly data used in the forecast is from January 2000 through November 2022. The forecasted 0.75 percent column includes the current tax rate with forecasted values throughout the remainder of 2022. The forecast scenarios utilized actual collections through November 2022 and supplemented the month of December. The Economics Center applied an autoregressive integrated moving average (ARIMA) model to the historical data. This model evaluates the historical growth patterns of collections and then considers contributing factors such as natural trends in the data (increases in collections due to, but not limited to, population changes, inflation, and spending habits) as well as seasonality of spending over time (month-to-month differences in spending due to holiday spending, for example).

<sup>5</sup> Data through November 2022.

<sup>6</sup> Per capita spending includes all taxable sales occurring within Butler County, not just those made by Butler County residents. This per capita figure was calculated to allow for the comparison of different tax rates over time so that elasticity, or relationship between different sales tax rates and spending, could be examined within the forecast model.



**Table 9: Annual Butler County Sales Tax Collections, 2000 – 2032 (Nominal\$)**

<b>Year</b>	<b>Historical Collections (\$M)</b>	<b>Forecast, 0.75% (\$M)</b>	<b>Forecast, 1.0% (\$M)</b>
2000	\$15.91		
2001	\$16.33		
2002	\$16.62		
2003	\$17.11		
2004	\$18.41		
2005	\$22.61		
2006	\$40.66		
2007	\$41.32		
2008	\$33.11		
2009	\$29.77		
2010	\$29.59		
2011	\$30.75		
2012	\$32.59		
2013	\$35.15		
2014	\$37.45		
2015	\$41.39		
2016	\$44.07		
2017	\$43.65		
2018	\$43.19		
2019	\$45.17		
2020	\$45.01		
2021	\$53.53		
2022	\$56.87 <sup>7</sup>		
2023		\$58.07	\$77.23
2024		\$58.53	\$77.85
2025		\$59.02	\$78.50
2026		\$59.51	\$79.14
2027		\$59.97	\$79.76
2028		\$60.41	\$80.35
2029		\$60.83	\$80.91
2030		\$61.23	\$81.44
2031		\$61.61	\$81.94
2032		\$61.96	\$82.41

*Source: Ohio Department of Taxation and Economics Center forecast results.*

<sup>7</sup> December sales tax collections data not yet available from the Ohio Department of Taxation. The 2022 tax collections represent actual collections from January through November with December values imputed.

Table 10 shows the forecasted current collections as well as the marginal gains for the increased rate scenario. The forecasted collections at the current county rate of 0.75 percent show the amounts projected to be generated for Butler County between 2023 and 2032. An increase to the Butler County sales tax rate of 0.25 percentage points will result in additional sales tax revenues ranging from \$19.16 million in 2023 to \$20.45 million in 2032. In total, increasing the local sales tax rate from 0.75 percent to 1.00 percent will generate approximately \$198.40 million in additional revenue.

**Table 10: Butler County Forecasted Sales Tax Collections, 2023-2032**

Year	Forecasted Current Collections, 0.75% (\$M)	Forecast Marginal Collections, 1.0% (\$M)
2023	\$58.07	\$19.16
2024	\$58.53	\$19.32
2025	\$59.02	\$19.48
2026	\$59.51	\$19.64
2027	\$59.97	\$19.79
2028	\$60.41	\$19.94
2029	\$60.83	\$20.08
2030	\$61.23	\$20.21
2031	\$61.61	\$20.33
2032	\$61.96	\$20.45
<b>Total</b>	<b>\$601.14</b>	<b>\$198.40</b>

Source: Economics Center forecast results and calculations.

**Incremental Sales Tax Burden for Butler County Personas**

The Economics Center identified five personas that collectively represented more than half (56.1%) of Butler County residents 18 years of age and older.<sup>8</sup> The five personas identified were an employed individual with a bachelor's degree or higher; an individual with family income less than or equal to 175.0 percent of the poverty threshold; an employed individual aged 18 to 25 years; a retired individual aged 65 years and older; and an employed individual that is transit dependent. On average, the incremental, annual sales tax burden for these five personas ranged from \$12.66 for employed individuals between the ages of 18 and 25 and \$27.84 for employed individuals with a bachelor's degree or higher, as detailed in Table 11.

The employed individual with a bachelor's degree or higher persona represented 63,925 Butler County residents aged 18 years and older, or 21.3 percent of the population 18 years and older. On average, individuals in this persona had total personal income of \$83,473. Based on the Midwest Consumer Expenditure Survey, individuals in this persona would have annual taxable spending of \$11,135. This would result in \$83.52 in sales tax paid to Butler County at the current sales tax rate of 0.75 percent. At the increased sales tax rate of 1.00 percent, \$111.35 in sales tax would be paid to Butler County. This results in an average incremental

<sup>8</sup> An individual may be represented in more than one persona; therefore, the sum of the percent of the Butler County population aged 18 years and older by persona will exceed 56.1 percent.

sales tax burden of \$27.84 for an employed individual with a bachelor's degree or higher in Butler County.

The individual with family income less than or equal to 175.0 percent of the poverty threshold persona represented 55,762 residents of Butler County aged 18 years and older. This corresponds to 18.6 percent of the population 18 years and older in Butler County. The Economics Center selected the 175.0 percent of the poverty threshold to represent individuals that are just below self-sufficiency. Individuals in this persona had an average of \$9,860 in total personal income, which resulted in annual taxable spending of \$6,682. Individuals in this persona would have paid \$50.11 in sales tax to Butler County at the current rate of 0.75 percent and \$66.82 at the increased rate of 1.00 percent. This results in an average incremental sales tax burden of \$16.70 for an individual with family income less than or equal to 175.0 percent of the poverty threshold in Butler County.

The employed individual between the ages of 18 and 25 persona represented 32,959 Butler County residents aged 18 years and older, or 11.0 percent of the population 18 years and older. Individuals in this persona had total personal income averaging \$20,978, which led to annual taxable spending of \$5,064. This would result in \$37.98 in sales tax paid to Butler County at the current sales tax rate of 0.75 percent. At the increased sales tax rate of 1.00 percent, \$50.64 in sales tax would be paid to Butler County. This results in an average incremental sales tax burden of \$12.66 for an employed individual between the ages of 18 and 25 in Butler County.

Approximately 10.6 percent of the population aged 18 years and older in Butler County were represented in the retired individual aged 65 years and older persona.<sup>9</sup> On average, individuals in this persona had total personal income of \$51,485, which resulted in annual taxable spending of \$7,411. The sales tax paid to Butler County would be \$55.58 at the current rate of 0.75 percent and \$74.11 at the increased rate of 1.00 percent. For the retired individual aged 65 years and older persona, the average incremental sales tax burden would be \$18.53.

The employed individual that is transit dependent persona represented 5,623 residents of Butler County aged 18 years and older.<sup>10</sup> This corresponds to 1.9 percent of the population 18 years and older in Butler County. Individuals in this persona had an average of \$39,822 in total personal income, which resulted in annual taxable spending of \$8,414. Individuals in this persona would have paid \$63.11 in sales tax to Butler County at the current rate of 0.75 percent and \$84.14 at the increased rate of 1.00 percent. This results in an average incremental sales tax burden of \$21.04 for an employed individual that is transit dependent in Butler County.

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<sup>9</sup> Retired individuals refer to individuals reporting retirement, survivor, and disability pension income other than Social Security.

<sup>10</sup> Transit dependent is defined as individuals who reported their primary means of transportation to work was a bus, subway, bicycle, or walking.

**Table 11: Incremental Sales Tax Burden for Personas in Butler County, 2021  
(2021\$)**

Persona	Population Aged 18 Years and Older	Weighted Average Total Income	Taxable Spending	Sales Tax at Current Rate (0.75%)	Sales Tax at Increased Tax Rate (1.00%)	Incremental Sales Tax Burden
Employed individual with a bachelor's degree or higher	63,925	\$83,473	\$11,135	\$83.52	\$111.35	\$27.84
Individual with family income less than or equal to 175.0% of the poverty threshold	55,762	\$9,860	\$6,682	\$50.11	\$66.82	\$16.70
Employed individual aged 18 to 25 years	32,959	\$20,978	\$5,064	\$37.98	\$50.64	\$12.66
Retired individual aged 65 years and older	31,919	\$51,485	\$7,411	\$55.58	\$74.11	\$18.53
Employed individual that is transit dependent	5,623	\$39,822	\$8,414	\$63.11	\$84.14	\$21.04

Source: Economics Center analysis of U.S. Census microdata from IPUMS.<sup>11</sup>

## Conclusion

BCRTA provides an important service to the community through connecting workers to their places of employment and providing access to education, government services, medical services, and shopping.

In addition to providing connectivity to jobs, key services, and other community amenities, BCRTA also benefits the county-wide economy through the economic and fiscal impacts associated with its capital and operations expenditures. Between 2023 and 2033, BCRTA will directly generate \$67.2 million in economic output in Butler County, which will lead to further indirect economic output of \$30.0 million. The capital and operations expenditures of BCRTA will directly support 1,158 jobs with earnings of \$39.7 million. On average, 105 jobs with earnings of \$3.6 million will directly supported by BCRTA each year. Indirectly, the capital and operations expenditures of BCRTA will support an additional 217 jobs with \$11.7 million in earnings in Butler County. Over this 11-year period, the capital and operations expenditures of BCRTA will generate \$97.2 million in economic output and support 1,375 jobs with earnings of \$51.4 million.

Under the current system, the planned capital and operations expenditures of BCRTA will generate a total of \$2.6 million in state and local tax revenue between 2023 and 2033. The

<sup>11</sup> Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas and Matthew Sobek. IPUMS USA: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2022.

capital and operations expenditures of BCRTA will directly generate more than \$692,000 in state earnings tax revenue, nearly \$784,500 in local earnings tax revenue, approximately \$457,000 in sales tax revenue for the State of Ohio, and an estimated \$59,600 in sales tax revenue for Butler County. The operations and capital expenditures of BCRTA will indirectly lead to an additional \$253,800 in state earnings tax revenue, \$214,600 in local earnings tax revenue, \$97,000 in state sales tax revenue, and \$12,700 in sales tax revenue for Butler County.

Under BCRTA's current route system, approximately 20,750 jobs can be accessed within a ¼-mile of a BCRTA stop within Butler County. The wages associated with these transit-accessible jobs total more than \$1.1 billion, or an average of \$54,663 per job.

When examining the distribution of jobs within a ¼-mile buffer of BCRTA's current stops, the Cities of Hamilton and Middletown are the clear hub of the current network. The southwest and west portions of Butler County, including West Chester and Liberty Townships display substantial job density, however the majority of these jobs are located outside of the ¼-mile buffer of a stop along the current BCRTA route network.

The Educational Services Industry has the most jobs that can be accessed, under the current route system, within a ¼-mile of BCRTA stops (6,441 jobs), followed by the Health Care and Social Assistance Industry (2,389 jobs), and the Public Administration Industry (2,256 jobs).

Butler County households are estimated to have generated approximately \$21.9 million in local sales tax revenue in 2021. Households in the \$100,000 to \$149,999 range provided the most local sales tax to Butler County. These households also comprised the largest group with 26,862 households in the County.

The amount of sales tax revenue that accrued to Butler County totaled approximately \$53.5 million. Considering Butler County households generated \$21.9 million in sales tax revenue for Butler County, it can be concluded that spending subject to sales tax made by local households represent approximately 41.0 percent of Butler County's local sales tax revenue.

It may be necessary for BCRTA to invest in service enhancements and improved amenities. However, these improvements will likely require additional funding. Under BCRTA's current funding model, the agency is not able to secure additional federal funding for transit-related improvements. In order to leverage additional federal funding, BCRTA will need to secure additional local funding. If BCRTA were to seek an increase to the local sales tax rate, such an increase to the local sales tax rate of 0.25 percentage point will result in additional sales tax revenues ranging from \$19.16 million in 2023 to \$20.45 million in 2032. In total, increasing the local sales tax rate from 0.75 percent to 1.00 percent will generate approximately \$198.38 million in additional revenue during the forecast period.

The Economics Center identified five personas that collectively represented more than half (56.1%) of Butler County residents 18 years of age and older. The five personas identified were an employed individual with a bachelor's degree or higher; an individual with family income less than or equal to 175.0 percent of the poverty threshold; an employed individual aged 18 to 25 years; a retired individual aged 65 years and older; and an employed individual that is transit dependent. On average, the incremental, annual sales tax burden for these five

personas ranged from \$12.66 for employed individuals between the ages of 18 and 25 and \$27.84 for employed individuals with a bachelor's degree or higher.