

**CBAER** 

Center for Business Analytics and Economic Research

GEORGIA SOUTHERN UNIVERSITY

# An Analysis of the Interactive Entertainment Income Tax Credit

Prepared for

Georgia Department of Audits and Accounts

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Center for Business Analytics and Economic Research

Georgia Southern University

December 13, 2022

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The Center for Business Analysis and Economic Research (CBAER) of the Business Innovation Group (BIG) in the Office of Research at Georgia Southern University was engaged to conduct a study by the Georgia Department of Audits and Accounts.



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## Executive Summary

The qualified interactive entertainment production company income tax credit is part of the Georgia Entertainment Investment Act, commonly referred to as the film tax credit. This report focused on the fiscal and economic impact of this income tax credit. The interactive entertainment industry covers the video game development industry, which is one component of the software publishing industry.

Using data from the Georgia Game Developers Association, an average of 133 companies were eligible to use this tax credit between 2016 and 2020.<sup>1</sup> Many of these companies are new ventures that have developed a new video game or software that could support gameplay. The research team analyzed a five-year time frame from the 2017 to 2021 calendar years. Over this time frame, using data provided by the Georgia Department of Revenue there was an average of 34 projects that used this income tax credit annually. The total economic output of the companies that used this tax credit was \$389.547 million, and the total value added was \$312.202 million. The tax revenue linked to these companies reached \$7.383 million paid to the State of Georgia and \$5.571 million paid to local governments.

This segment of the entertainment industry represents a growing part of the marketplace. It is another way that consumers spend their entertainment time. Many, particularly younger, consumers are searching for more interactive and immersive forms of entertainment. For some, this need is met by playing a video game with social components and immersive storylines. These games may lay hold of the occasional headline, but it is not the only type of video game. Many adults play mobile games on their smartphones with limited or no storyline. The average age of Gamers in the United States is 33 years old, and 76 percent of all game players are over 18. Additionally, young adults typically play for connection, relaxation, and thrill provided by the game, whereas older adults are looking for a way to stay mentally sharp and see video games as another avenue for self-improvement.<sup>2</sup>

Across this spectrum of how and why people play video games, one factor is universal: someone had to develop the video game. The interactive entertainment tax credit in Georgia is capped at \$12.50 million in available credit each year. The credit must go to a video game developer working on a project that can be completed in one year. Between 2016 and 2021, video game developers used \$25.996 million in tax credits from the available \$62.50 million, according to usage data provided by the Georgia Department of Revenue. Additionally, when companies apply to access this tax credit, they must report the amount of private financing backing the project. This is referred to as the base investment. Across this time frame, companies reported \$260.873 million in base investment.

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<sup>1</sup> This is the most recent year that data is available.

<sup>2</sup> Entertainment Software Association, "2022 Essential Facts about the Video Game Industry," June 10, 2022. <https://www.theesa.com/resource/2022-essential-facts-about-the-video-game-industry/> (accessed September 2022)

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## Tax Provision Background/Overview

This report provides an analysis of the economic contribution and fiscal impact of the companies that utilized the Qualified Interactive Entertainment Production Company (QIEPCs) tax credit between 2017 – 2021. The QIEPC tax credit is one segment of the "Georgia Entertainment Industry Investment Act" (OCGA §48-7-40.26), or the film tax credit. The General Assembly passed the act in 2005, and the tax credit covers the production of films, television programs, and digital interactive entertainment.<sup>3</sup> The film tax credit has been widely recognized as a factor in encouraging film and television productions to locate in Georgia. In contrast, the impact of the QIEPCs tax credit has been less well understood.

The General Assembly has revised the QIEPCs tax credit on four separate occasions. Starting in 2012, HB 1027 more clearly defined the type of companies that qualify for this credit and added a maximum lifetime award per company of \$5 million and an annual program cap of \$25 million. This legislation also added an alternative marketing option for promotional credit. In 2014, HB 958 reduced the maximum award per company tax credit annual cap to \$1.5 million per company and \$12.5 million total annual program cap per year and set 2016 as the sunset date. The following year, in 2015, HB 339 amended the QIEPC provisions by adding the pre-approval process and delaying sunset until 2019. The final revision came in 2017 with HB 199, which eliminated the sunset provisions for this tax credit, lowered spending requirements, and changed payroll requirements.<sup>4</sup>

This tax credit is part of the Georgia Department of Economic Development (GDEcD) efforts to support the development of interactive entertainment production companies. QIEPCs tax credit is being used in the marketing effort of GDEcD.<sup>5</sup> A tax credit reduces a taxpayer's final direct tax bill, dollar-for-dollar.<sup>6</sup> When a taxpayer files their income tax, the credit can be applied to reduce the amount of taxes owed. The implied purpose of the QIEPCs credit portion of the film tax credit is to grow the video game industry in Georgia.<sup>7</sup> The tax credit is targeted to businesses with physical locations in Georgia that are working on an interactive entertainment product, which in this case refers to the production of video games.

To use QIEPC tax credit, businesses must first be approved by the Georgia Department of Revenue (DOR) to qualify for the credit. Applicant companies must meet several minimum requirements: the business must maintain a physical location in Georgia, have a minimum

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<sup>3</sup> Georgia Department of Audits and Accounts, Performance Audit Division, *Impact of the Georgia Film Tax Credit*. January 2020, Performance Audit 18-03B, Atlanta, GA, 1, <https://www.audits.ga.gov/ReportSearch/download/23536> (accessed September 2022).

<sup>4</sup> *Ibid*, 3.

<sup>5</sup> Georgia Department of Economic Development, "Film & Entertainment," *Georgia USA*, <https://www.georgia.org/industries/film-entertainment> (accessed September 2022).

<sup>6</sup> Tax Foundation, "Tax Credit," <https://taxfoundation.org/tax-basics/tax-credit/> (accessed November 2022).

<sup>7</sup> Georgia Department of Economic Development, "Interactive Entertainment," *Georgia USA*, <https://www.georgia.org/industries/film-entertainment/interactive-entertainment> (accessed September 2022).

payroll of \$250,000 for all in-state workers in a taxable year, report a gross income below \$100 million, and demonstrate their primary engagement in qualified production activities related to interactive entertainment.<sup>8</sup> If a company is deemed eligible, it must select a qualifying project and submit it to the Georgia Department of Economic Development for approval.

The base tax credit is 20 percent and covers expenditures linked to the approved game development project. Companies may qualify for an additional 10 percent in tax credits by agreeing to add the Georgia Entertainment Promotion (GEP) Logo to their game. The first option for accessing the additional 10 percent credit is for companies to embed a Georgia logo within the completed project. Video production companies often place on the home screen/loading page of their game. Another option to receive the 10 percent GEP Logo Uplift credit is to provide Alternative Marketing Opportunities. These alternative marketing plans must offer equal or greater value for the State of Georgia and must be pre-approved by GDEcD.<sup>9</sup>

The total impact on State revenue linked to this tax credit is capped annually at \$12.5 million in available credits for all qualifying projects. Individual companies cannot receive more than \$1.5 million from this tax credit.<sup>10</sup> Each recipient must reapply each year to continue participating in the program, and multiyear projects are not eligible for this tax credit. However, the Georgia Department of Economic Development can grant extensions to companies that have not completed their approved project within the allocated time frame. It is also possible for companies to participate in this program several times in consecutive years.

According to the Department of Revenue Income Tax Division rule 560-7-8-.45 for the Film Tax Credit, if a qualified interactive entertainment company is a pass-through entity with no tax liability of its own, the credit is passed to its members, shareholders, or partners. Additionally, the QIEPC can sell or transfer the credit to another Georgia taxpayer. If the credit is sold, the price must be at least 60 percent of the credit amount being sold. A QIEPC can only sell or transfer credits earned in a taxable year once, but the sale may involve more than one transferee and have more than one sale date. These transactions must be completed before the end of the carryforward period.

Although the QIEPC tax credit focuses on all forms of interactive entertainment, video game production companies are typically the recipients. This tax credit is a tool used by the state of Georgia to develop its video game industry and support the production of new projects and

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<sup>8</sup> Georgia Department of Economic Development, "Frequently Asked Questions – Georgia Entertainment Industry Investment Act Interactive Entertainment," *Georgia USA*, 2, [https://www.georgia.org/sites/default/files/2022-06/frequently\\_asked\\_questions\\_interactive\\_2022.pdf](https://www.georgia.org/sites/default/files/2022-06/frequently_asked_questions_interactive_2022.pdf) (accessed September 2022).

<sup>9</sup> Georgia Department of Economic Development, "Georgia Interactive Tax Credit Application," November 30, 2021, <https://www.cognitoforms.com/GDECD1/GeorgiaInteractiveTaxCreditApplication> (accessed September 2022).

<sup>10</sup> *Ibid.*

video game titles. The video game industry consists of physical games and software, consoles, accessories, online games for mobile devices, and online games for consoles.

Video games are very popular among the adult population. In the United States, 76 percent of game players are over 18, with 33 being the average age of an American gamer.<sup>11</sup> The video game industry includes both the software and hardware segments of this business. In 2022, the video game industry generated a revenue of \$90.1 billion and employed 277,000 individuals in the United States. Over the next five years (2022 – 2027), industry revenue and employment are expected to increase at an annual rate of 8.6 percent.<sup>12</sup>

## Tax provision-related Activity

The remainder of this report will focus on the software development side of the video game industry. The Center for Business Analytics and Economic Research examined the software publishing industry because this is where video game production companies are located using North American Industrial Classification System definitions. The Software Publishers Industry (NAICS 511210) includes the development and publishing of applications, packaged computer software, video game development and publishing, and other related activities.<sup>13</sup>

In the United States, the software industry reached annual revenues of \$442.507 billion and total employment of 843,000 in 2022. Over the next five years (2022-2027), it is estimated to increase revenue by 3.1 percent and total employment by 4.6 percent annually.<sup>14</sup> Included within this industry, the video game software publishing segment reached a revenue of \$41.924 billion (9.5 percent of total software industry revenue) and employment levels of 130,000 jobs (15.4 percent of total software industry employment) in 2022. This segment is estimated to grow revenue by 5.4 percent and employment by 5.8 percent over the next five years.<sup>15</sup> These figures illustrate that software development is a large and growing part of the U.S. economy and that video game software development is an important part of the overall industry.

To determine the effect of the video game software industry in Georgia, the team collected information on the economic contribution, number of businesses, and employment linked to this industry. The Georgia Game Developers Association (GGDA) has regularly conducted an annual economic contribution analysis focusing on the video game software development industry and companies that could use the QIEPC tax credit in Georgia. The GGDA data used in this analysis starts with the 2017 report (measuring data from the calendar year 2016). From

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<sup>11</sup> Entertainment Software Association, (accessed September 2022).

<sup>12</sup> Jonathan Burns, "Video Games in the U.S.," *IBISWorld*, August 2022, U.S. Industry (NAICS) Report NN003, <https://my.ibisworld.com/us/en/industry/nn003/industry-at-a-glance> (accessed September 2022).

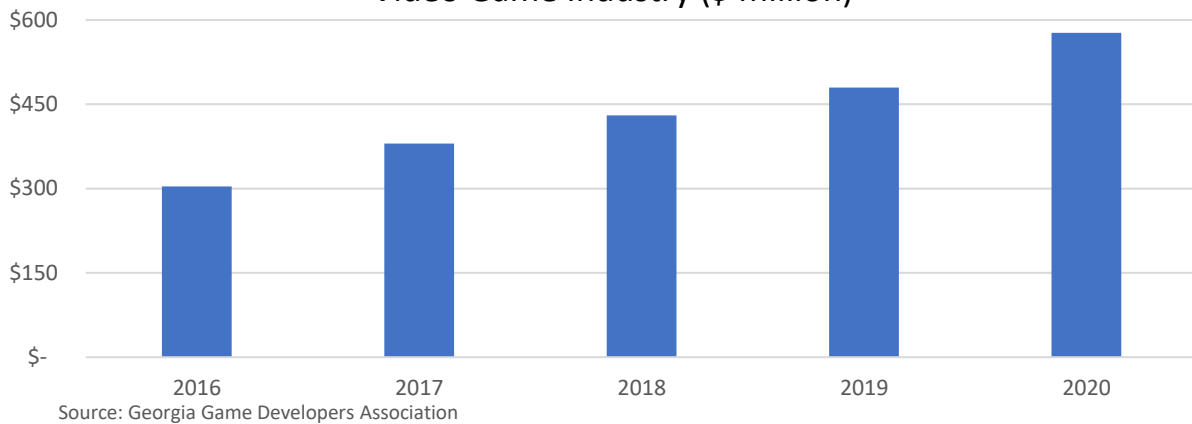
<sup>13</sup> North American Industry Classification System, 2022 NAICS Definition, 513210 Software Publishers, <https://www.census.gov/naics/?input=513210&year=2022&details=513210>

<sup>14</sup> Jared Ristoff, "Software Publishing in the U.S.," *IBISWorld*, August 2022, U.S. Industry (NAICS) Report 51121, <https://my.ibisworld.com/us/en/industry/51121/about> (accessed September 2022).

<sup>15</sup> Jonathan Burns, "Video Game Software Publishing in the US," *IBISWorld*, July 2022, U.S. Industry (NAICS) Report 51121E, <https://my.ibisworld.com/us/en/industry/51121e/about> (accessed September 2022).

these reports,<sup>16</sup> the research team compared state industry revenues from year to year. These revenue figures were derived using a survey of firms in this industry. The results, as seen in Figure 1, show that gross revenue has nearly doubled from 2016 to 2020; see Figure 1 for details.

Figure 1: Georgia Gross Revenue Tax Credit Eligible Video Game Industry (\$ million)



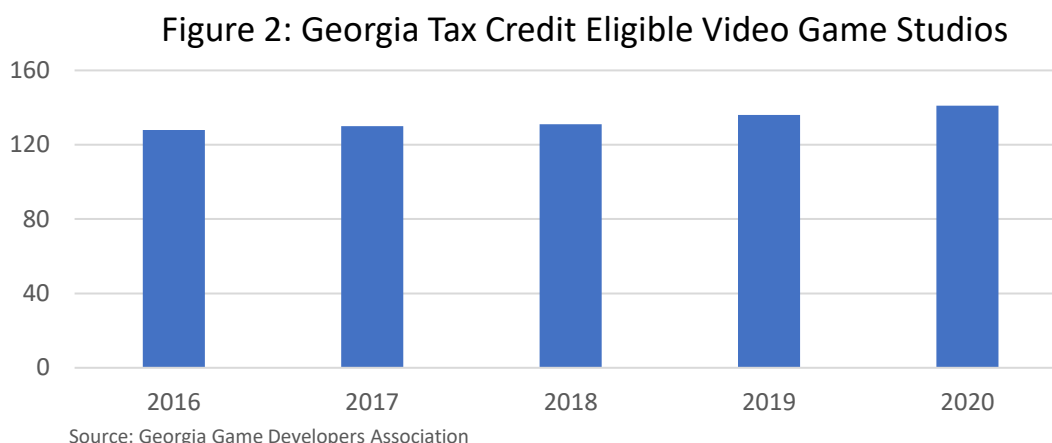
Over the analyzed time frame, the average annual growth rate of industry revenue was 17 percent. Well above the 6 percent average annual rate of growth in the software publishing industry revenue in the United States from 2016 to 2020.<sup>17</sup> The information in Figure 1 was the most recent data from the GGDA when this report was being prepared. As a point of comparison, the team examined gross state product data from the software publishing industry in Georgia. A further examination of gross state product in Georgia between 2020 and 2021 found that the software publishing industry grew by 24.4 percent,<sup>18</sup> which is a positive signal that the video game software industry should continue to increase.

<sup>16</sup> All five studies used, “Economic Contributions of the Georgia Video Game Industry in 2016/2017/2018/2019/2020,” were conducted and produced by Jay O’Toole in October 2017, October 2018, October 2019, November 2020, and November 2021, respectively, and commissioned by the Georgia Game Developers Association.

<sup>17</sup> Ristoff, “Software Publishing in the U.S.”

<sup>18</sup> Data retrieved from JobsEQ by Chmura Economics.

Next, the team examined the number of businesses in the video game industry eligible to receive the interactive entertainment tax credit, as reported by the GGDA.



Over the time frame in Figure 2, the number of interactive entertainment tax credit-eligible video game studios increased at an annual rate of 2.5 percent. The expansion of these businesses is growing slower than the number of establishments in the software publishing industry, which increased by 6.5 percent annually over the same time frame.<sup>19</sup> Despite the lower growth rate compared to the software publishing industry, 13 video game production companies were added to this industry over the analyzed five year time frame. The QIEPC tax credit is one factor that has influenced this trend. In 2005 eight businesses in Georgia qualified for QIEPC, but by 2020, 141 businesses were eligible<sup>20</sup>, a 1,662 percent increase in business activity over this 15-year time frame.

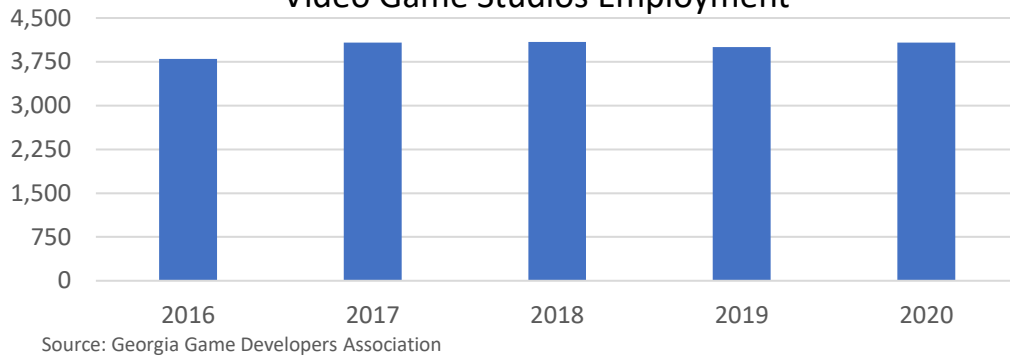
Lastly, the team examined the level of employment linked to these businesses. Employment has remained constant since 2016 at around 4,000 full-time workers. See Figure 3 for details.

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<sup>19</sup> Data retrieved from JobsEQ by Chmura Analytics.

<sup>20</sup> Jay O'Toole, "Economic Contributions of the Georgia Game Industry in 2020," *Commissioned by the Georgia Game Developers Association*, November 2021

Figure 3: Georgia Tax Credit Eligible Video Game Studios Employment



Total employment peaked in 2020 at 4,080. Comparatively, employment in the software publishing industry increased by 5.8 percent over this time frame in Georgia. From 2020 to 2021, software publishing industry employment grew to 22,745 individuals, an increase of 13.3 percent.<sup>21</sup> These growth rates are well above the employment growth rate for all industries in Georgia between 2016 and 2021, which grew by an average annual rate of 1 percent.

### Comparison with Other States

Many states across the United States support companies in the entertainment industry. Traditionally these programs have supported content development for film and television producers, and they have often taken the form of income tax credits.

As the entertainment marketplace continues to diversify, several states have expanded the definition of entertainment to include interactive entertainment/video game production. This form of entertainment is projected to grow over the next five years. For example, within the U.S. video game software industry, annual industry-wide revenue is projected to grow by 5.4 percent from 2022-2027, bringing industry revenue to \$54.433 billion in 2027.<sup>22</sup>

In 2020, the Entertainment Software Association prepared an economic analysis that estimated the economic impact of the video game industry on all fifty states in the U.S. This report was a comprehensive analysis that includes developers, publishers, interactive platforms and media, hardware, physical distribution, retail, arcades/video gaming establishments, and other relevant activities. A closer look at the states with the largest contributions to this industry reveals that Georgia ranks in the top 15 states for total employment (jobs) and total output (total revenue). Table 1 depicts these figures.

<sup>21</sup> Data retrieved from JobsEQ by Data Chmura.

<sup>22</sup> *ibid*

**Table 1: Top 15 States Ranked by Employment and Output Impacts in the Video Game Industry**

Top 15 States – Total Employment		Top 15 States - Output	
State	Rank	State	Rank
California	1	California	1
Washington	2	Washington	2
Texas	3	Texas	3
Florida	4	Florida	4
New York	5	New York	5
Nevada	6	Nevada	6
Illinois	7	Minnesota	7
North Carolina	8	Idaho	8
Idaho	9	Illinois	9
Minnesota	10	North Carolina	10
<b>Georgia</b>	<b>12</b>	Colorado	11
Pennsylvania	11	Massachusetts	12
Massachusetts	13	<b>Georgia</b>	<b>13</b>
Colorado	14	Pennsylvania	14
Ohio	15	Rhode Island	15

Source: The Entertainment Software Association

Georgia ranks 12th in total employment and 13th in output, the total amount of goods and services produced in the video game industry. Combined, California and Washington account for 62.8 percent of total employment in the industry and 70.2 percent of total output. Both states have very well-developed technology industries, which provides an advantage in interactive entertainment/video game production.

Four states in the southeast region have developed a strong interactive entertainment/video game production industry: Texas, Florida, North Carolina, and Georgia. Each state has more than \$800 million in economic contributions statewide, with North Carolina, Florida, and Texas having more than \$1.2 billion in economic contributions. These three high-performing southeastern states illustrate that developing interactive entertainment/video games can contribute to the state economy.

Four states within the top 15 listed in Table 1 are using entertainment tax credit programs to support the development of the video game industry. These states include Texas, Georgia, Colorado, and Rhode Island. Except for Texas, which ranks fourth in the listed categories, the three other states are outside the top ten. Other states on this list could be using another section of their tax codes to incentivize the development of video game production companies. The data illustrates that the presence of a video game tax credit within the entertainment industry does not directly link to being a top producer of video games.

Within the 35 states that offer entertainment industry production incentives, only 16 states (46 percent), including Georgia, have included video games or interactive entertainment as part of the incentives. Each state has different limitations on the incentive amount offered, the minimum investment required, the single project cap, and the annual statewide total program cap; see Table 2 for details.

**Table 2: States that Offer Interactive Entertainment/Video Game Production Incentives Inclusive of Their Film Tax Credit**

State	Incentive	Minimum Spend	Project Cap	Annual State Cap
Alabama	25% or 35% nontransferable refundable tax credit	\$500K	\$20M	\$20M
Arkansas	20% or 30% tax credit or rebate	\$200K	None	\$4M (tax credit) Discretionary (rebate)
Colorado	20% Rebate	\$250K (for video games)	None	\$9.25M
Connecticut	10% - 30% transferable, refundable tax credit	\$100K (10% credit) \$500K (15% credit) \$1M (30% credit)	None	None
Georgia	Up to 30% tax credit	None	\$1.5M	\$12.5M
Hawaii	20% or 25% transferable, refundable tax credit	\$200K	\$15M	\$50M
Indiana	Up to 30% nonrefundable tax credit	None	None	\$5M
Louisiana <sup>+</sup>	18% tax credit (production) 25% tax credit (in-state labor)	None	None	None
Maine	10% or 12% wage rebate 5% nonrefundable, nontransferable tax credit (non-wage expenses)	\$75K	None	None
Mississippi	25% - 30% rebate	\$50K	\$10M	\$20M
Montana	20% - 35% transferable tax credit	\$350K	None	\$12M
New Mexico	25% - 35% refundable tax credit	None	None	\$100M
Oregon	20% - 26.2% rebate	\$1M	50% of OPIF <sup>~</sup>	\$20M (OPIF)
Rhode Island	30% transferable tax credit	\$100K	\$7M	\$30M
Texas	Up to 22.5% cash grant	\$100,000 (for video games)	None	Varies by appropriation cycle
Virginia	15% - 45% tax credit or grant	\$250K (tax credit) None (grant)	None	\$6.5M (tax credit) \$3M (grant)

<sup>+</sup> Specifically Digital Interaction Media and Software Program

<sup>~</sup> Oregon Production Investment Fund, <sup>^</sup> Greenlight Oregon Labor Rebate

Sourced from Entertainment Partners, <https://www.ep.com/production-incentives/us/> (accessed September 2022) and embedded links

The incentives offered by the states listed in Table 2 are typically income tax credits, income tax rebates, and grant programs. The 16 states that include video games/interactive entertainment



incentives in their entertainment incentive programs have two ways to implement this incentive. The first is to simply include video games/interactive entertainment in the state film tax credits' eligible activities. This strategy encourages competition between all other forms of entertainment covered by the incentives. In states that are capping the tax incentives, this strategy can make it difficult for video game projects to stand out compared to movie or television productions. States following this approach include Alabama, Arkansas, Hawaii, Indiana, Maine, Mississippi, Montana, Rhode Island, and Virginia. For example, Mississippi has a minimum investment of \$50,000 in local spending per production for all projects. It requires that "at least 20 percent of the production crew on payroll must be Mississippi residents."<sup>23</sup> These criteria apply to all qualified entertainment productions in Mississippi, forcing video game productions to compete against film and television productions.

The second approach to implementing video games/interactive entertainment incentives is to set specific incentive amounts or program requirements for this entertainment segment. States that have taken this approach include Colorado, Connecticut, Louisiana, New Mexico, Oregon, and Texas. The incentive amounts vary widely between these states. For example, Colorado expects companies to meet a specified level of investment for qualifying entertainment projects, including film, television shows, commercials, video game production, etc. For film and television show production operated by out-of-state producers, the minimum investment is \$1 million in qualified local expenses to be eligible for a 20 percent tax rebate. In contrast, out-of-state production companies working on commercial and video game projects are required to have \$250,000 in local expenses that qualify.<sup>24</sup> Colorado is acknowledging the smaller scale of a single video game production by providing a different standard for video game productions while still incentivizing companies to bring their productions to this state.

Texas is another example of a state with a separate standard for video game production incentives. The Texas incentive takes the form of a grant titled the Texas Moving Image Incentive Program (TMIIP). This program aims to make Texas a destination for the production of "film, television, commercial, animation, visual effects, video game, extended reality (X.R.), and other moving image productions."<sup>25</sup> This program was created because Texas does not have a state income tax. To qualify for the grant program, video game productions must spend \$100,000 to be eligible for a 5 percent incentive; film & television projects start at \$250,000 for the same incentive level. The value of the incentive increases as the project investment grows, topping out at \$3.5 million for a 20 percent incentive plus an additional 2.5 percent if the

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<sup>23</sup> Film Mississippi, "Incentive," <https://filmississippi.org/incentive/> (accessed September 2022).

<sup>24</sup> State of Colorado, Office of Economic Development & International Trade, "Colorado Film Incentive," <https://oedit.colorado.gov/colorado-film-incentive> (accessed September 2022)

<sup>25</sup> State of Texas, Office of the Governor, Texas Film Commission, "Texas Moving Image Industry Incentive Program," <https://gov.texas.gov/film/page/miiip> (accessed September 2022).

project is in an underutilized or economically distressed area. Overall, the Texas grant program values film and video game production at the same level in percentage terms.<sup>26</sup>

## Literature Review

This literature review investigates three segments of the video game industry. First, the demographic characteristics of video game players, known as "gamers," and how the industry compares to film and television entertainment. Second, the skills and educational requirements to become a video game developer, as well as the type of skills gamers develop. Third, CBAER examined other ways that technologies developed for video games can be used outside of the gaming world.

### Video Games Age Demographic and Comparison to Film/Television Entertainment

In the entertainment industry, the attention of consumers is being pulled in a variety of directions. This includes traditional broadcast television, streaming services, social media, and video games. The on-demand streaming video services market is maturing as consumers manage multiple services with low switching costs. These low switching costs led to an average churn rate of 35 percent in 2021, as consumers manage costs by moving from one streaming service to another in search of the best content.<sup>27</sup> The switching trend is particularly true for younger consumers who are not as tied to traditional entertainment as older customers.

Some younger consumers are seeking more interactive and immersive forms of entertainment. Within the Gen Z age group (ages 10 -25), video games and interactive content are the preferred form of entertainment.<sup>28</sup> This is pushing the entertainment industry to build content that is part of an immersive world of content that has a social component. These game worlds are attracting brands and entertainers interested in becoming part of the first generation of the metaverse.<sup>29</sup> Still in its infancy, the metaverse is without a standard definition, but its goal is to create a "seamless convergence of our physical and digital lives, creating a unified, virtual community where we can work, play, relax, transact and socialize."<sup>30</sup> Technology is advancing to allow people to engage with immersive and interactive digital systems where many businesses and economies exist online and in real life.<sup>31</sup> There are signs that this has already

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<sup>26</sup> *ibid.*

<sup>27</sup> Deloitte United States, "2022 Media & Entertainment Industry Outlook," <https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/media-and-entertainment-industry-outlook-trends.html>. (accessed March 30, 2022).

<sup>28</sup> Kevin Westcott, et al, "2022 Digital Media Trends, 16th Edition: Toward the Metaverse," Deloitte, United states, September 8, 2022, <https://www2.deloitte.com/us/en/insights/industry/technology/digital-media-trends-consumption-habits-survey/summary.html> (accessed September 2022).

<sup>29</sup> *ibid.*

<sup>30</sup> J. P. Morgan, "Opportunities in the Metaverse: How businesses can explore the metaverse and navigate the hype vs. reality," 2022, <https://www.jpmorgan.com/content/dam/jpm/treasury-services/documents/opportunities-in-the-metaverse.pdf> (accessed September 2022).

<sup>31</sup> Westcott, "2022 Digital Media Trends, 16th Edition" (accessed September 2022).

begun as professional video gamers are reaching levels of stardom previously reserved for film or television actors due to their social media following, further encouraging audiences to engage with interactive entertainment.<sup>32</sup>

Building on the potential shift in the entertainment industry, the current video game industry has been working to develop content that engages consumers' attention. The gaming industry has seen a gradual increase in users across most age groups due to the wide variety of games that are available. For example, more than half of smartphone owners admit to playing a game on a daily basis, meaning that not all games played by an adult are fully immersive with a social component. Whether people are playing mobile games, fully immersive games, or something in between, game playing does cut into entertainment time that could have been spent with a film or television show.<sup>33</sup>

Many people have assumed that gamers are a small subset of society. However, the gamer community is much larger than many people have assumed. In 2022, 66% of Americans played video games at least once a week, translating to 215.5 million active gamers in the United States, and 69 percent of households have at least one video game player in their household. Gender does not appear to play a role in gaming interest, with 48 percent being females and 52 percent being males. When age is included as part of the demographic breakdown, the average gamer is 33 years old, and 76 percent of all players are over the age of 18.<sup>34</sup> Additionally, various age groups also play video games for different reasons. Younger adults, ages 18 to 34, tend to play video games for "comfort, connection, letting loose and excitement," while "older adults (especially 65+) are more likely to value games for 'using my brain,' passing time, personal time and to improve themselves."<sup>35</sup>

### Skills and Education Requirements for Video Game Developers

While economic activity is spurred through the purchasing and playing of video games for personal use, the video game industry also contributes to the economy through the development of human capital. This is seen in both the hard skills required by the workforce to create these products and the soft skills developed by users in playing the games. Gamers are able to hone skills that are desirable in the workplace, like teamwork and collaboration, critical thinking, and decision-making.<sup>36</sup> For example, gamers must make many decisions in video games that have risks and consequences, and this hones a gamer's ability to think analytically.

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<sup>32</sup> *ibid.*

<sup>33</sup> *ibid.*

<sup>34</sup> Entertainment Software Association, "2022 Essential Facts about the Video Game Industry," June 10, 2022, <https://www.theesa.com/resource/2022-essential-facts-about-the-video-game-industry/> (accessed September 2022)

<sup>35</sup> *ibid.*

<sup>36</sup> Man Power Group, "How Gamers Are Developing the Soft Skills Employers Need," [https://go.manpowergroup.com/hubfs/Gaming\\_Assets/game-to-work-how-gamers-are-developing-the-soft-skills-employers-need.pdf](https://go.manpowergroup.com/hubfs/Gaming_Assets/game-to-work-how-gamers-are-developing-the-soft-skills-employers-need.pdf) (accessed September 2022).

Games like *Civilization* and *StarCraft* demand strategic decision-making to advance to the next stage. *Grand Theft Auto* is a hallmark example of a game that encompasses various levels of multi-tasking. *Guitar Hero* and *Rock Band* are games that require undivided attention to score well. This can improve the player's level of concentration during a task and is a skill that can translate into other environments. All these skills are necessary for developing a productive workforce.<sup>37</sup>

The hard skills required to become part of the game development workforce include computer programming, graphic design, sound design, animation, story writing, and user interface design. Although many people are interested in designing video games, the required technical skills do serve as a barrier for some segments of the workforce. Some examples of programming languages used in the game development industry include Java, Python, and C++; software packages like Autodesk Maya and Adobe Suite; and game engine software like Unity, GDevelop, and Unreal Engine.<sup>38</sup> Individuals with a knowledge of these programming languages are in high demand both within the game development industry and wider software publishing industry. Therefore, employees with computer skills who work to develop and program game software will have strong job opportunities in several other industries in the economy.

Aspiring game developers are generally required to possess at least a bachelor's degree or a certification in a computer related field. The ubiquity of computers and digital systems has also encouraged institutions of higher learning to offer programs that provide students with additional specialized knowledge to thrive in game development.<sup>39</sup> For example, the Graduate School of Education at the University of Pennsylvania developed a "Video Games and Virtual Worlds" course in 2008. The interdisciplinary program was created to teach students the history of video games, how they are designed, and their use in education.<sup>40</sup> Some other

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<sup>37</sup> Insight Software, "10 Video Game Skills That Make You a Better Employee," September 30, 2022, <https://insightsoftware.com/blog/10-video-game-skills-that-make-you-a-better-employee/> (accessed October 2022).

<sup>38</sup> CG Spectrum, "Game Programmer Job Description, Salary, Skills & Software," *CG Spectrum*, <https://www.cgspectrum.com/career-pathways/game-programmer> (accessed October 2022).

<sup>39</sup> Dustin Tyler, "The In-Depth Guide to Game Developer 101," *Game Designing*, <https://www.gamedesigning.org/career/game-developer/> (accessed October 2022).

<sup>40</sup> Penn Today, "Gaming as a teaching tool," <https://penntoday.upenn.edu/news/gaming-teaching-tool> (accessed October 2022).

institutions that offer degrees, training, or certifications in VR and AR related fields include Chapman University,<sup>41</sup> Harvard University,<sup>42</sup> and Ohio University.<sup>43</sup>

In Georgia, there are a variety of educational options for students that are interested in pursuing game development as a course of study. There are currently 12 schools that are governed by the University System of Georgia that offer game development as a course of study. These programs are found at research universities, including Augusta University, the University of Georgia, and Georgia State University. There are also three comprehensive universities with programs which include Georgia Southern University, Kennesaw State University, and the University of West Georgia. Within the four-year public grouping, there are six that provide a video game development degree program, including Clayton State University, Columbus State University, Georgia Southwestern University, Middle Georgia State University, and University of North Georgia. There are also six private institutions that offer degrees in game development. Included in this group are the Savannah College of Art and Design in both Savannah and Atlanta, Berry College, and Clark Atlanta University.<sup>44</sup> These programs are offered at various institutions across this state, and students are not limited to a particular geographic area within Georgia.

For students who are not interested in pursuing a four-year degree but would like to join the game development industry, the Technical College System of Georgia also offers five degree programs in video game development. The programs at Athens Technical College, Gwinnett Technical College, and Wiregrass Georgia Technical College focus on developing programming skills. In contrast, the other two programs provided by Chattahoochee Technical College and Georgia Piedmont Technical College are more focused on game design. Combined, these universities and technical colleges are working together to develop a workforce with the technical skills required to be part of the video game industry. One commonality between technical and four-year degrees is that participants are often encouraged to participate in internships to gain real world experience while studying. Although having a strong educational background in game development is important, it is not the only way to become part of this industry.<sup>45</sup>

Years of experience with a proven track record is also valued highly in game development. Even without a degree, a candidate can demonstrate value to a game studio by furnishing a robust

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<sup>41</sup> Chapman University, "VR and AR, Minor," Academics, [https://catalog.chapman.edu/preview\\_program.php?catoid=42&poid=8065&returnto=2217](https://catalog.chapman.edu/preview_program.php?catoid=42&poid=8065&returnto=2217) (accessed October 2022).

<sup>42</sup> Harvard University, "AR/VR Studio," Harvard Innovation Labs, <https://innovationlabs.harvard.edu/arvr-studio/> (accessed October 2022).

<sup>43</sup> Ohio University, "VR & Game Development Program Overview," J. Warren McClure School of Emerging Communication Technologies, <https://www.ohio.edu/scripps-college/mcclure/prospective-students/vr-games-undergrad> (accessed October 2022).

<sup>44</sup> Greenberg, Andrew. "Game Dev and Related Program in Georgia" Email 2022

<sup>45</sup> Greenberg, Andrew. "Game Dev and Related Program in Georgia" Email 2022

portfolio of similar work that highlights key experience and skills. A contemporary alternative to seeking a college degree is accredited online courses that allow users to acquire certification in specific programming languages. This is an important skill because, throughout their career, video game developers must continue learning to keep their skills up to date.<sup>46</sup>

### Other uses for game technologies

Video games are primarily designed to be fun, recreational activities that aid in increasing brain function and can improve cognitive skills. The advent of more sophisticated technologies has popularized the adaptation of several gaming techniques into many different aspects of daily living. As one of the most successful industries worldwide, gaming has also pioneered advancements in innovative technologies such as facial recognition, gesture control, virtual reality, augmented reality, and voice recognition. Additionally, the hardware and software created by many game developers have found practical applications outside of their intended recreational space.<sup>47</sup>

Virtual Reality (VR) is becoming increasingly popular as a teaching tool in medical education. The immersive, virtual environment provided by VR headsets and 360 videos, for example, offers learners and educators an interactive and safe approach to medical simulation.<sup>48</sup> VR technology also provides surgeons access to diverse, repeatable training techniques that would otherwise be too expensive or cumbersome to replicate in real life. Numerous medical professionals credit their dexterity in complex operating procedures like laparoscopic surgery to hours spent practicing similar movements in video games and virtual reality settings.<sup>49</sup> In essence, VR plays a significant role in medical education by saving time, space, and physical resources. It also eliminates geographical boundaries and the need for the presence of expert faculty.

The rise of Augmented Reality (AR) and its application in gaming also helps educators in the teaching process by leveraging tools that the students are already familiar with. Academics continue to investigate the possibilities of historical preservation and exploration through AR.<sup>50</sup> Some other applications of gaming technology in other industries include the use of flight

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<sup>46</sup> Timothy Peck, "7 Degrees for Aspiring Video Game Designers," CollegeVine Blog, July 8, 2021, <https://blog.collegevine.com/degrees-for-aspiring-video-game-designers/>.

<sup>47</sup> Hannah George, "The Impact of Technology on the Gaming Industry!" *Supply Chain Game Changer*, September 17, 2022, <https://supplychaingamechanger.com/the-impact-of-technology-on-the-gaming-industry/> (accessed October 2022).

<sup>48</sup> Jack Pottle, "Virtual Reality and the Transformation of Medical Education," *Future Healthcare Journal* 6, no. 3 (2019), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6798020/>

<sup>49</sup> BBC News, "'Video Games Made Me a Better Surgeon'," October 31, 2018, <https://www.bbc.com/news/uk-46036095> (accessed October 2022).

<sup>50</sup> Troy Hittle, "Mapping an Historic Internment Camp," xyHt, September 18, 2019, <https://www.xyht.com/aerialuas/mapping-an-historic-internment-camp/> (accessed October 2022).

simulators that help pilots practice difficult maneuvers in a controlled environment.<sup>51</sup> Additionally, new gesture technology is helping to push for equal accessibility for individuals with disabilities. For example, there are wearable technologies that translate the hand movements of sign language into speech and skill-based games that are used for classroom education.<sup>52</sup>

Another interesting application of VR/AR technology is in the development of social management skills. The TLE TeachLivE™ Lab is an innovative mixed-reality environment developed by the University of Central Florida that supports the practice of skill sets necessary for teaching, developing, and managing social interactions with virtual avatars in realistic settings.<sup>53</sup> This technology has been adopted by over 40 universities and schools within and outside the U.S., and it affords instructors the opportunity to develop observations and annotations in a safe environment that supports reflective learning. Learners (even those with significant disabilities) are able to demonstrate authentic human connections that develop necessary transition skills.<sup>54</sup> Institutions outside the learning environment have also found a use for similar technology. College students are able to prepare for job interviews by practicing in a less tense environment, hospitality staff develops better customer service skills, and law enforcement officers refine their de-escalation tactics in potentially violent situations.<sup>55 56</sup>

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<sup>51</sup> Genba Digital, "How Gaming Is Transforming Other Industries for the Better," August 26, 2020, <https://genbadigital.com/how-gaming-is-transforming-other-industries-for-the-better/> (accessed October 2022).

<sup>52</sup> Frankie Wallace, "How Gaming Advancements Are Pushing Tech in Other Fields," HeadStuff, October 25, 2019, <https://headstuff.org/entertainment/gaming/gaming-advancements-pushing-tech-other-fields/> (accessed October 2022).

<sup>53</sup> Deanna Ferrante, "A Cutting-Edge Classroom Simulator at UCF Is Helping Educators Become Better Teachers," *Pegasus Magazine*, University of Central Florida, 2017, <https://www.ucf.edu/pegasus/kickin-new-school/> (accessed October 2022).

<sup>54</sup> William & Mary School of Education, "TLE TeachLivE™," <https://education.wm.edu/centers/teachlive/index.php>. (accessed November 2022).

<sup>55</sup> STRIVR, "How VR Is Innovating De-Escalation Training," <https://www.strivr.com/blog/deescalation-training/> (accessed November 2022).

<sup>56</sup> Carey Rhodes, "Minnesota Police Officers Use VR Technology for Deescalation Training," *Apex Officer*, October 3, 2022, <https://www.apexofficer.com/resources/minnesota-police-officers-use-vr-technology-for-deescalation-training> (accessed October 2022).

## Economic Activity

The economic contribution analysis looks at how the interactive entertainment tax credit contributes to economic output, value added, labor income, and employment. While the alternative use analysis examines what would have happened if the credit was not offered.

### Economic Contribution Analysis

Economic activity in this section is measured by the amount of dollars invested in the interactive entertainment industry by companies who are participating in the QIEPC tax credit. The team used a five-year time frame which covered 2017 to 2021 for this analysis. In an average year, 34 projects are supported, including an average base investment of \$52.174 million in current year dollars. These participating interactive entertainment companies had claimed an average of \$5.198 million in tax credits over this time frame. The net economic return of this tax break was \$46.976 million in a typical year. (The information used to estimate these returns are discussed in the Fiscal Impact section.) These findings illustrate that the potential investment made by participating companies generates a net positive return for the economy when the base investment and the overall size of the income tax being credited are compared.

As noted in the Tax Provision Background/Overview, the total allowable credit for the Georgia film tax credit in any year is \$12.5 million. This is the maximum amount of revenue the state was willing to forgo in each of the five years covered by this analysis. However, this total amount of allocated tax credit was not used in any year from 2017 to 2021. Over the course of this five-year time frame, the total amount of interactive entertainment tax credit claimed was \$25.996 million in current year dollars, well below the aggregated \$62.50 million that was allotted. See Table 3 for annual totals of claimed credit.

**Table 3: Amount of Claimed Interactive Entertainment Tax Credit\***

	2017	2018	2019	2020	2021
<b>Credit Claimed<sup>+</sup></b>	\$3,885	\$8,912	\$4,587	\$7,882	\$724
<b>Total Allocated</b>	\$12,500	\$12,500	\$12,500	\$12,500	\$12,500

\*1,000 Dollars  
 + current year dollars

The use of this tax credit varies dramatically between 2017 and 2021. Usage peaked in 2018 at \$8.912 million and dropped to \$724,000 in 2021. This shift in usage of the tax credit is likely due to companies' ability to use the credit to offset tax liability or their ability to sell credits in a given year. The tax credits may be carried forward for up to five years if the taxpayer using the credit does not have a sufficient tax liability to utilize the credit. This credit will be used in future years as the monetary return for video game developers improves or the market for purchasing the credit expands.



The base investment linked to the QIEPC tax credit represents the amount of economic activity that the state is crediting to the interactive entertainment industry. In other words, the analysis also simultaneously highlights what linked economic activity might be lost if the companies had not received the tax credit. The research team has conducted an economic contribution analysis which represents the contribution from funds already being used in the economy, while an economic impact analysis typically focuses on new dollars entering a regional economy. Either analysis can be calculated using an input/output model. In this case, the team used the IMPLAN model covering the state of Georgia for the economic contribution analysis. IMPLAN, one of the most widely utilized input/output models, was created as a partnership between the United States Forest Service and Federal Emergency Management Agency in the mid-70s. Later the software and other adjustments were handled by the University of Minnesota. It was privatized in 1991 and now operates as a fully private company.<sup>57</sup>

CBAER began by examining the output within Georgia linked to the base investment, which is the amount of private financing backing the project. The base investment serves as the amount of the direct investment used in Table 4. Output covers the monetary value of industry production, which includes net sales and inventory changes estimated by using annual production estimators embedded in IMPLAN.<sup>58</sup> Table 4 depicts the economic output of the base investment used by participating companies to acquire the QIEPC tax credit in Georgia.

**Table 4: Output – Georgia Interactive Entertainment Tax Credit\*\***

	2017	2018	2019	2020	2021
<b>Direct</b>	\$46,323	\$46,938	\$57,132	\$51,673	\$58,807
<b>Indirect</b>	6,596	6,684	8,136	7,358	8,374
<b>Induced</b>	17,850	18,087	22,015	19,912	22,661
<b>Total</b>	\$70,770	\$71,710	\$87,282	\$78,943	\$89,842

\*1,000 Dollars

\*current year dollars

Across the five-year time frame of this analysis, indirect spending (business-to-business) transactions and induced contribution (consumer-to-business) transactions accounted for 34.5 percent of total contributions linked to the tax credit. Within this industry, the induced transaction was the second largest source of economic contribution after the direct category. Overall, the video game developers and software industries require fewer physical goods or supplies than other industries in the economy. This increases the economic value linked to the induced transactions because these companies rely more on the creativity of their employees to generate value for the operation. From 2017 to 2021, linked indirect spending accounted for

<sup>57</sup> “40+ Years Experience: An Unrivaled History of Economic Expertise.,” *IMPLAN*, <https://implan.com/history/> (accessed October 2022).

<sup>58</sup> Candi Clouse, “Output – IMPLAN - Support,” *IMPLAN*, <https://support.implan.com/hc/en-us/articles/115009668388-Output> (accessed October 2022).

27 percent of the secondary transactions, while induced spending made up 73 percent of this category.

Next, the team examined value added, closely related to gross state product. It removes many of the intermediate inputs in the Output category and includes employee compensation, proprietors' income, taxes on production and imports, and other property income. Some of the intermediate inputs not included in the value added include the consumption of goods and services purchased from other industries and goods imported from outside the target area.<sup>59</sup> Table 5 depicts the value added of the base investment used to acquire the QIEPC tax credit in the state of Georgia.

**Table 5: Value Added – Georgia Interactive Entertainment Tax Credit\*+**

	2017	2018	2019	2020	2021
<b>Direct</b>	\$40,910	\$41,453	\$50,455	\$45,634	\$51,935
<b>Indirect</b>	4,021	4,074	4,959	4,485	5,104
<b>Induced</b>	10,507	10,647	12,959	11,721	13,339
<b>Total</b>	\$55,438	\$56,174	\$68,373	\$61,840	\$70,378

\*1,000 Dollars

+ current year dollars

In addition to the software publishing industry, interactive entertainment companies influence the development of several other sectors of the state economy. Outside of the direct sector, five of the top secondary industries include real estate, employment service, banking, and financial services, healthcare/hospitals, and management companies/professional services. Each of these service-providing industries is also supporting many other industries within the state economy.

When the transactions for the value added category are aggregated each year, the contribution of indirect and induced transactions shifts slightly from the previously discussed output finding. Across the five years of this analysis, indirect transactions accounted for 27.7 percent of the total contribution linked to the tax credit, while induced transactions covered the remaining 72.3 percent of related economic activity.

The third monetary value included in this part of the analysis was labor income linked to the use of the income tax credit. Labor income consists of both employee compensation and proprietor's income and includes both wages paid and benefits provided to employees.<sup>60</sup> Table 6 depicts the labor income resulting from the base investment used to acquire the QIEPC tax credit within the state of Georgia.

<sup>59</sup> Candi Clouse, "Value Added – IMPLAN - Support," IMPLAN, <https://support.implan.com/hc/en-us/articles/115009498847-Value-added> (accessed October 2022).

<sup>60</sup> Candi Clouse, "Labor Income – IMPLAN- Support," IMPLAN, accessed October 10, 2022, <https://support.implan.com/hc/en-us/articles/115009668468-Labor-Income>.

**Table 6: Labor Income – Georgia Interactive Entertainment Tax Credit\*\***

	2017	2018	2019	2020	2021
<b>Direct</b>	\$19,256	\$19,512	\$23,749	\$21,480	\$24,445
<b>Indirect</b>	2,544	2,577	3,137	2,837	3,229
<b>Induced</b>	5,669	5,744	6,992	6,324	7,197
<b>Total</b>	\$27,469	\$27,833	\$33,878	\$30,641	\$34,871

\*1,000 Dollars

\*current year dollars

The amount of indirect and induced transactions captured in the labor income figures varied from year to year based on the size of the direct spending. For example, in 2018, indirect spending reached \$2.586 million, and induced transactions were \$5.744 million. A similar pattern was noted in 2021, where indirect spending was \$3.229 million, and induced spending was just under \$7.0 million. Across the five years of this analysis, indirect transactions accounted for 31 percent of the total contribution linked to the tax credit, while induced transactions covered the remaining 69 percent of related economic activity.

Finally, the total employment linked to companies that are using the income tax credit is also included in this analysis. Employment includes all full-time, part-time, and temporary labor.<sup>61</sup> Table 7 depicts the employment supported by the base investment used to acquire the interactive entertainment tax credit within the state of Georgia.

**Table 7: Employment – Georgia Interactive Entertainment Tax Credit**

	2017	2018	2019	2020	2021
<b>Direct</b>	155	157	191	173	197
<b>Indirect</b>	38	38	47	42	48
<b>Induced</b>	112	113	138	125	142
<b>Total</b>	305	309	376	340	387

Although the overall impact of this industry is spread widely throughout the labor market, several industries have stronger ties to interactive entertainment. The top secondary employment linked to interactive entertainment is slightly different from the value-added categories discussed previously. While the largest support industry is employment services, the second largest is the restaurant industry, followed by real estate services and healthcare. Additionally, the retail industry in general merchandise and food and beverage stores are some of the strongest support industries for the interactive entertainment industry.

Across the analyzed time frame, the direct spending linked to video game developers added a sizable number of jobs to the Georgia economy. For example, in 2017, the 155 direct jobs linked

<sup>61</sup> Candi Clouse, "Employment – IMPLAN - Support," IMPLAN, accessed October 10, 2022, <https://support.implan.com/hc/en-us/articles/115009668668-Employment>.

to the base spending yielded 150 support jobs across the economy. This figure increased in 2021 to 197 direct jobs supporting 190 secondary jobs. Within this analysis, each job considered is available in an individual year. Many individuals may hold a job for multiple years, which means that totaling these findings across years will create a double count of jobs and overstate the value of the industry. However, looking across each year in the analysis, the interactive entertainment credit is helping to support many other jobs in this state.

### But For Analysis

The most recent count of video game and eSports Production companies in Georgia is 412, according to a 2021 Technology Association of Georgia report.<sup>62</sup> From this total, 141 individual companies in the video game industry were eligible for the Interactive Entertainment Production Company tax credit in 2020 using data from the Georgia Game Developers Association.<sup>63</sup> This is a 1,662 percent increase from the eight businesses eligible for the QIEPC tax credit in Georgia in 2005.<sup>64</sup>

From 2017 to 2021, the \$398.547 million in economic activity attributable to the QIEPC tax credit is estimated to have generated \$4.022 million in new sales tax receipts, \$797,000 in new corporate profits taxes, \$3.572 million in new personal income taxes, \$4.049 million in new property taxes, and \$514,000 in new other taxes (See Fiscal Impact section for additional detail). This totals \$12.954 million in new tax revenue that would not have been generated but for the \$25.990 million in tax credits. To manage this program, the DOR and GDEcD are each using less than one person a year to enroll and collect the tax revenue linked to this program.<sup>65</sup> That said, the QIEPC tax credit is one factor influencing the development of the video game industry. It is a targeted credit that is limited in scale when compared to the overall size of the industry. Industry leaders view this tax credit as part of a business retention strategy that will help small companies create new products to enhance their growth over time. It is not viewed as a tool that could easily be used to lure a large existing video game production company.<sup>66</sup>

Other factors influencing the video game production industry are business conditions that make growth possible. These include the total addressable market (i.e., local sales/test market), regulatory environment (ease of starting a business), availability of an IT workforce,<sup>67</sup> and

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<sup>62</sup> Technology Association of Georgia, "TAG Media & Entertainment Ecosystem Report 2021: A Diverse and Dynamic Industry," 2021, <https://www.tagonline.org/wp-content/uploads/2021/12/TAG-Media-and-Entertainment-Report.pdf>

<sup>63</sup> *ibid*

<sup>64</sup> *ibid*

<sup>65</sup> Information provided by Georgia Department of Audits and Accounts

<sup>66</sup> Interview with Andrew Greenberg, Executive Director, Georgia Game Developers Association, November 15, 2022.

<sup>67</sup> Paula Fitzgerald, "The Road To Silicon Valley: How Tech Companies Choose Their Hometowns," accessed November 2022 [https://www.wtca.org/blog\\_posts/the-road-to-silicon-valley-how-tech-companies-choose-their-hometowns?locale=en](https://www.wtca.org/blog_posts/the-road-to-silicon-valley-how-tech-companies-choose-their-hometowns?locale=en)

access to startup capital. These market conditions are a major driving factor for starting a video game production business in Georgia.

The video game industry in Georgia has had many successful companies start and grow in this state since 2005. Two examples of video game production companies that started in Georgia are HI-REZ Studios and Tripwire Interactive LLC. First, HI-REZ Studios developed the game SMITE Battleground Of The Gods, a multiplayer online battle area (MOBA) game where players control mythical creatures that participate in team-based combat. This game currently has 30 million players worldwide.<sup>68</sup> In contrast, Tripwire Interactive LLC developed the Killing Floor series. This first-person shooter game has players battle creatures in a post-apocalyptic world. In 2019, Tripwire Interactive announced that this series had earned over \$100 million and had been played by 15 million unique players since it launched in 2009.<sup>69</sup>

While the availability of the QIEPC tax credit did not influence either company's decision to locate in Georgia, it did have an effect on both firm's ability to develop these platforms. Without being offered the QIEPC tax credit, neither firm would have been able to successfully develop these games because the companies used these credits to offset expenses which ultimately led to the development of these games.<sup>70</sup> As a result, other video game production companies have chosen to launch in Georgia and follow the path of HI-REZ Studios and Tripwire Interactive LLC. The QIEPC tax credit has helped these, and other companies remain operational as they work to develop their first hit game.<sup>71</sup> In addition, these companies are typically following the bootstrapping model of development when entrepreneurs "start a company with little to no assets...rely on personal savings, sweat equity, lean operations, quick inventory turnover, and (operating) cash."<sup>72</sup> Companies in this position are typically funding future growth through revenue rather than venture capital or business loans and are more prone to rely on the QIEPC tax credit than larger video game production companies looking to expand operations.<sup>73</sup>

Due to the smaller size of the companies that typically qualify for the tax credit and the large number of external variables that could influence the decision to develop and launch a video

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<sup>68</sup> HI-REZ "SMITE BATTLEGROUND OF THE GODS," accessed November 2022, <https://www.hirezstudios.com/games>

<sup>69</sup> TRIPWIRE, "Tripwire Celebrates the 100-year anniversary of Killing Floor," <https://www.tripwireinteractive.com/#/news/tripwire-steam-publisher-sale>

<sup>70</sup> Interview with Andrew Greenberg, Executive Director, Georgia Game Developers Association, November 15, 2022.

<sup>71</sup> Interview with Andrew Greenberu, Executive Director, Georgia Game Developers Association, November 15, 2022.

<sup>72</sup> Will Kenton, "What Is Bootstrapping? What It Means and How It's Used Investing," Inverstopedia, accessed November 2022, <https://www.investopedia.com/terms/b/bootstrapping.asp#:~:text=Bootstrapping%20a%20company%20occurs%20when,investors%20or%20venture%20capital%20firms.>

<sup>73</sup> Interview with Andrew Greenberu, Executive Director, Georgia Game Developers Association, November 15, 2022.

game, CBAER found creating an estimate of what would have happened without the QIEPC tax credit to not be feasible within the context of this analysis.

### Alternate Use Reduction Analysis

The second analysis generated to estimate economic activity linked to the QIEPC tax credit is the alternate use reduction analysis. The alternate use reduction analysis assumed that the tax credit between 2017 and 2021 had been eliminated. The team used the amount of tax credit requested because if all the awarded tax credit were used within five years of the award, the state would reduce income tax collection by \$73.873 million. All of this credit cannot be used in a single year; however, as a point of reference, companies have five years to use their awards. Therefore, the total impact could be measured. Table 10 shows the aggregate alternate use reduction impact from 2017 to 2021. The impact of each individual year used in the analysis is presented in Appendix A.

**Table 10: Aggregated Alternative Economic Impact Requested  
Interactive Entertainment Tax Credit 2017 – 2021<sup>\*+</sup>**

	<b>Output**</b>	<b>Value-Added**</b>	<b>Labor Income**</b>	<b>Employment</b>
<b>Direct</b>	\$73,873	\$65,240	\$30,708	56
<b>Indirect</b>	10,520	6,412	4,056	14
<b>Induced</b>	28,467	16,756	9,041	40
<b>Total</b>	<b>\$112,859</b>	<b>\$88,408</b>	<b>\$43,805</b>	<b>110</b>

\*1,000 Dollars

+ current year dollars

In table 10, the team assumes that the elimination of the tax credit means that the state is allowed to use the income tax revenue linked to the credit elsewhere. If this had happened, overall employment would have been 56 direct and 110 total jobs. In a typical year, these jobs would have pay and benefits packages that are close to \$79,600 in annual compensation. The change would have had a larger impact on output and value added, with direct output increasing by \$73.987 million and value added growing by \$65.240 million in direct aggregated economic activity. The indirect and induced outputs account for an additional \$39 million in economic activity, which is 35 percent of the total output. These figures are somewhat similar to the findings for value added with secondary aggregated impacts of \$23.2168 million, which is 26 percent of the total.

Next, the team analyzed the impact of the tax collection without subsidies over the five-year time frame. Table 11 presents this information and assumes that the tax credit was not provided to video game developers.

**Table 11: Aggregated Alternative tax collection without the subsidy 2017-2021<sup>\*+</sup>**

	State	Local Taxes
<b>Georgia Income Tax Estimate</b>	\$1,446	\$0
<b>Sales Tax Estimates</b>	1,302	1,244
<b>Georgia All Other Taxes (estimated at 22% of total GA tax)</b>	775	
<b>Property</b>	0	2,190
<b>Total State and Local Tax Estimate</b>	\$3,523	\$3,434

\*1,000 Dollars

+ current year dollars

Across this time frame, state tax collections would have reached a total of \$3.523 million. Much of this tax collection comes from secondary impacts and individuals that are still required to pay state and local taxes. Taxes paid to local governments across Georgia would have reached \$3.434 million under this scenario, with property taxes being the largest contributor to this total. However, the economy of Georgia would have not generated \$398.5 million in total combined economic output between 2017 – 2021.

## Fiscal Impact

The fiscal impact of the interactive entertainment credit is determined by comparing the cost to the state of providing the credit to the increased revenue to state and local governments resulting from the incentives supplied by the credit. The cost to the state of providing this incentive for the years 2017 through 2021 is \$25.990. Table 12 summarizes the economic impact of the credit as discussed above.

**Table 12: Economic Impact of the Interactive Entertainment Credit, 2017-2021<sup>\*+</sup>**

Impact	Output <sup>**</sup>	Value-Added <sup>**</sup>	Labor Income <sup>**</sup>	Employment
<b>Direct</b>	\$260,873	\$230,387	\$108,442	197
<b>Indirect</b>	\$37,148	\$22,642	\$14,324	48
<b>Induced</b>	\$100,526	\$59,173	\$31,926	142
<b>Total</b>	\$398,547	\$312,202	\$154,692	387

\*1,000 of Dollars

+ current year dollars

The economic impact of the interactive entertainment credit also has an impact on state and local government tax collections which partially offset the revenue loss due to credit utilization. Companies pay sales tax on certain non-exempt items purchased in-state, and their employees pay income tax on their wages. The impact of this economic activity on state and local tax receipts is summarized in Table 13.

**Table 13: New Tax Revenue from Economic Activity, 2017-2021<sup>\*+</sup>**

Type of Tax	State Impact	Local Impact	Total
Sales tax	\$2,517	\$1,505	\$4,022
Corporate profits tax	797	0	797
Personal income tax	3,572	0	3,572
Property taxes	0	3,854	3,854
Other taxes	497	212	709
<b>Total tax receipts</b>	<b>\$7,383</b>	<b>\$5,571</b>	<b>\$12,954</b>

\*1,000 Dollars

+ current year dollars

To calculate the net revenue loss due to the interactive entertainment credit, the cost of the credit is offset by the net of the new tax revenue generated by the economic activity spurred by the credit less the tax revenue lost from the fiscal impact of alternative government spending is presented in Table 14.

**Table 14: Estimated Net State and Local Revenue Loss from the Interactive Entertainment Credit, 2017-2021<sup>\*+</sup>**

Type of Tax	Combined State and Local Impact
Interactive Entertainment Credit	(\$25,990)
New sales tax receipts	4,022
New corporate profits tax	797
New personal income tax	3,572
New property taxes	4,049
New other taxes	514
Foregone sales tax receipts from alternate spending	(2,546)
Foregone income tax receipts from alternate spending	(1,446)
Foregone property tax receipts from alternate spending	(2,190)
Foregone other tax receipts from alternate spending	(775)
<b>Net revenue loss from Interactive Entertainment Credit</b>	<b>(\$19,993)</b>

\*1,000 Dollars

+ 2021 dollars

The net revenue loss from the provision of the QIEPC credit yields an average cost per job created of \$51,662 for the years 2017 through 2021. The average return on the investment of



\$25,990,000 realized from the net new tax revenue is 23.1 percent over the five-year period or an average of 4.6 percent per year.

As of the end of the 2021 tax year, \$26,214,692 of the approved interactive entertainment credit had been utilized during tax years 2017 through 2022, and \$36,285,000 was available for carryforward as shown in Table 15.

**Table 15: Utilization and Carryover of Interactive Entertainment Credit, 2017-2021<sup>\*+</sup>**

Year	Approved	Utilized	Year Utilized	Carryforward	Expires
<b>2017</b>	\$12,500	\$3,885	<b>2017</b>		
		50	<b>2020</b>		
		122	<b>2021</b>		
		226	<b>2022</b>	\$8,217	<b>2022</b>
<b>2018</b>	12,500	8,912	<b>2018</b>	3,588	<b>2023</b>
<b>2019</b>	12,500	4,587	<b>2019</b>		
		85	<b>2020</b>	7,828	<b>2024</b>
<b>2020</b>	12,500	7,746	<b>2020</b>		
		17	<b>2021</b>	4,737	<b>2025</b>
<b>2021</b>	12,500	585	<b>2021</b>	11,915	<b>2026</b>
<b>Totals</b>	<b>\$62,500</b>	<b>\$26,215</b>		<b>\$36,285</b>	

\*1,000 Dollars

+ current year dollars

The team is assuming that taxpayers will not allow these credits to expire. This assumption is reasonable since the credits can be sold to individuals or other entities if the entity generating the credit cannot use it. Selling the credit at a steep discount would be preferable to allowing it to expire. Additionally, we are assuming that approximately 42 percent of the current year credits approved will be used in the year generated based on usage during the years 2017 through 2021. These assumptions yield the projection of credit utilization over the next five years, as indicated in Table 16.

**Table 16: Projected Interactive Entertainment Credit Utilization 2022-2026<sup>+</sup>**

Year	Current Credit	Current Utilized	Carryover Utilized	Total Utilization
2022	\$12,500	\$5,250	\$8,217	\$13,467
2023	12,500	5,250	3,588	8,838
2024	12,500	5,250	7,828	13,078
2025	12,500	5,250	4,737	9,987
2026	12,500	5,250	11,915	17,165
<b>Totals</b>	<b>\$62,500</b>	<b>\$26,250</b>	<b>\$36,285</b>	<b>\$62,535</b>

\*1,000 of Dollars

+ 2021 dollars

State and local tax receipts are impacted during the years 2022 through 2026 in the same manner as described before for the years 2017 through 2021. The spending that generates the tax credit will result in additional income subject to corporate and individual taxes, additional purchases that will be subject to the sales tax, and other transactions that will generate tax receipts from property and transfer taxes. The impact of the increased output of \$398.5 million spent on interactive entertainment activity on state and local tax revenues is presented in Table 17.

**Table 17: New Tax Revenue from Economic Activity, 2022-2026<sup>+</sup>**

Type of Tax	State Impact	Local Impact	Total
Sales tax	\$3,197	\$1,505	\$4,702
Corporate profits tax	1,013	0	1,013
Personal income tax	4,536	0	4,536
Property taxes	0	3,713	3,713
Other taxes	630	353	983
<b>Total tax receipts</b>	<b>\$9,376</b>	<b>\$5,571</b>	<b>\$14,947</b>

\*1,000 Dollars

+ 2021 Dollars

The net revenue loss due to the interactive entertainment credit projected for the years 2022 through 2026 is calculated by offsetting the cost of the credit utilized in this five-year period with the new tax revenue generated by the economic activity spurred by the spending that produces the credit. From this total, the tax revenue lost from the fiscal impact of alternative government spending is deducted to yield the net revenue loss from the credit provision. Table 18 presents this calculation.

**Table 18: Estimated Net State and Local Revenue Loss from the Interactive Entertainment Credit, 2022-2026\*\***

<b>Type of Tax</b>	<b>Combined State and Local Impact</b>
<b>Interactive Entertainment Credit Utilized</b>	( <b>\$62,535</b> )
<b>New sales tax receipts</b>	<b>4,702</b>
<b>New corporate profits tax</b>	<b>1,013</b>
<b>New personal income tax</b>	<b>4,536</b>
<b>New property taxes</b>	<b>3,713</b>
<b>New other taxes</b>	<b>983</b>
<b>Foregone sales tax receipts from alternate spending</b>	( <b>3,233</b> )
<b>Foregone income tax receipts from alternate spending</b>	( <b>1,836</b> )
<b>Foregone property tax receipts from alternate spending</b>	( <b>2,781</b> )
<b>Foregone other tax receipts from alternate spending</b>	( <b>984</b> )
<b>Net revenue loss from Interactive Entertainment Credit</b>	( <b>\$56,422</b> )

\* 1,000 of Dollars  
+ 2021 Dollars

The net revenue loss from the provision of the QIEPC yields an average cost per job created of \$114,912 for the years 2022 through 2026 because of the carryover usage. In order to account for carryover usage, the average cost per job over the entire period is more accurately reflected by adding the cost from the years 2017 through 2021 of \$19.993 million to the cost for years 2022 through 2026 of \$56.422 million and dividing this resulting cost by the total number of jobs created for the period 2017 through 2026. Total new jobs created during the period 2017 through 2021 was 387, and the total number of new jobs created for the period 2022 through 2026 were 491, for a total of 878 new jobs.

Therefore, the average cost per job created for the years 2017 through 2026 was \$87,033. This overall average is much higher than the \$51,662 estimated cost per job for the years 2017 through 2021 because of the impact of the carryforward tax credits from 2017 through 2021 that were not used during those years but are projected to be used during the projected years 2022 through 2026. Carryover credit utilization does not yield additional economic activity and does not create new jobs. It is a benefit provided based on prior economic activities. The team believes that this utilization of carryforward credits is a reasonable assumption since allowing the credits to expire when they could be sold, even at a steep discount, would be irrational. Further, the team believes this presentation is a more accurate reflection of the true cost of the credit since carryforwards of credits generated prior to 2017 were not available to the team and would likely have yielded similar results.

## Public Benefit

The QIEPC tax credit provides the state of Georgia and the public with several benefits. Throughout this report, the monetary impacts of this program have been well documented; however, not all benefits and impacts are monetary. Generally, adjustments in tax policy can be made to encourage individuals to take particular actions. This section of the report explores how this income tax credit could have non-monetary benefits that encourage individuals to take certain actions, all of which are beneficial to the public. The first is the development of new forms of entertainment, which strengthens the development of the entertainment production industry. The second is the development of a strong software development industry, which is a critical part of preparing Georgia for the 21st century economy.

### New Forms of Entertainment

As noted in the literature review, many younger media consumers (aged 34 and below) are seeking interactive forms of entertainment. For many, this form of entertainment is preferred to traditional film or television production. The media business has always been driven by the desires of younger consumers. It is possible that the entertainment habits generated in youth will continue into their adulthood, thereby increasing competition for the limited recreation time that individuals are willing to dedicate to electronic forms of entertainment. Although this shift is not likely to eliminate film and television production, this industry could experience changes in demand as a result of increased interest in video games.

States and communities that are producing different types of entertainment will continue to supply in-demand content to end users. One way to ensure that Georgia is part of this content creation process and able to reap its benefits is to support the development of different forms of entertainment, including video game production. By encouraging small video game production studios to conduct business in Georgia, the likelihood of creating industry-changing content will increase. The growth of the video game industry further influences the establishment of training programs at various levels of education, which in turn attracts more established companies to stay in the region.

### Strengthen Software Development Industry

As technology becomes a larger part of the workplace, a strong software industry will become vital to state economies. This industry will play a strong role in the development of technologies that transform the workplace. Several industries are already using video games as training tools. This allows trainees to make consequential mistakes in the virtual world so that they can avoid these errors in the real world. The software development industry is largely required to create these virtual training programs.

Additionally, supporting the development of a strong video game industry consequently supports the growth of human capital within the software development industry. Some individuals who currently work in video game development may move on to other jobs or career paths within the larger software development industry. Video game production can be considered a gateway into this industry as gaming attracts interest at an early age. Middle school and high school student gamers that are aware of the possibility of developing games in Georgia may be influenced to learn coding and other related computer skills, and this interest

may carry into their decisions to study technology-related degrees at the collegiate level. Choosing this academic path opens students to the larger software development industry, where they may join the video game development workforce or discover an interest in another segment of the industry. This pipeline is easier to facilitate when there is a strong video game development industry in Georgia.

## Summary and Conclusions

The QIEPC tax credit makes an economic contribution to Georgia. Video game studios that used the income tax break generated \$89.842 million in economic output and supported 387 jobs in calendar year 2021. This impact is consistent from 2017 to 2021, which totaled \$398.547 million in output and \$312.2 million in value added during this time frame.

In terms of tax revenue, the video game development industry still contributed to the state and local governments due to sales tax paid on non-exempt items and income taxes paid by both the corporation above the requested credit and their employees. Between 2017 and 2021, the new tax revenue linked to these companies reached \$7.383 million paid to the State of Georgia and \$5.571 million paid to local governments.

In addition, the research team also performed an alternate use analysis. This analysis examined what would have happened if the QIEPC tax credit was not part of the Georgia Tax code. The impact was calculated using the total amount of requested QIEPC income tax credit which totals \$73.873 million between 2017 – 2021. The total requested amounts are the maximum amount that the State would have to pay out in tax credit if all the requests were awarded. By law, this total amount of tax credit cannot be used in one year. However, companies have five years to use the tax credit they are awarded. Following this format, income tax collection would have been \$73.873 million over this timeframe. In total, state economic activity would have totaled \$112.859 million in output and \$88.408 in total value added without the QIEPC. The State would still have collected \$3.528 million in tax collection, and the local governments would have collected \$3.434 million.

Together the economic, fiscal, and alternative use finding of this report illustrate that QIEPC is a targeted tax credit. Based on discussions with industry leaders, this tax credit is used to retain businesses and jobs in Georgia rather than attract new companies. Firms are using this tax credit to develop new platforms as they work to create the first hit game for their operation. For example, HI-REZ Studios and Tripwire Interactive, INC., have used this credit and gone on to develop games that have 10's of millions of unique players. The credit has played a role in developing successful companies that are creating new technologies that are strengthening Georgia's IT and entertainment industries.

## Appendix A: Alternative Use economic impact and tax revenue 2017-2022

### 2017 Alternative Use Economic Activity<sup>+</sup>

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	44	\$5,421,915	\$11,518,973	\$13,043,228
Indirect Effect	11	\$716,192	\$1,132,074	\$1,857,350
Induced Effect	32	\$1,596,259	\$2,958,561	\$5,026,112
<b>Total Effect</b>	<b>86</b>	<b>\$7,734,367</b>	<b>\$15,609,608</b>	<b>\$19,926,690</b>

+ current year dollars

### 2017 New State and Local Alternative Use Tax Estimates<sup>+</sup>

	State tax	Local Tax
Property Tax Estimates	\$0	\$435,704
GA Income Tax Estimate	\$255,234	
Sales Tax Estimates	\$259,141	\$247,483
GA All Other Taxes (estimated at 22% of total GA tax)	\$145,080	
<b>Total State and Local Tax Estimates</b>	<b>\$659,455</b>	<b>\$683,187</b>

+ current year dollars

### 2018 Alternative Use Economic Activity<sup>+</sup>

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	44	\$5,491,656	\$11,667,139	\$13,211,000
Indirect Effect	11	\$725,404	\$1,146,635	\$1,881,241
Induced Effect	32	\$1,616,792	\$2,996,617	\$5,090,761
<b>Total Effect</b>	<b>87</b>	<b>\$7,833,852</b>	<b>\$15,810,391</b>	<b>\$20,183,002</b>

+ current year dollars

### 2018 New State and Local Alternative Use Tax Estimates<sup>+</sup>

	State tax	Local Tax
Property Tax Estimates	\$0	\$435,524
GA Income Tax Estimate	\$258,517	
Sales Tax Estimates	\$259,034	\$247,381
GA All Other Taxes (estimated at 22% of total GA tax)	\$145,976	
<b>Total State and Local Tax Estimates</b>	<b>\$663,527</b>	<b>\$682,905</b>

+ current year dollars

### 2019 Alternative Use Economic Activity<sup>+</sup>

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	54	\$6,747,866	\$14,335,983	\$16,233,000
Indirect Effect	13	\$891,339	\$1,408,927	\$2,311,572
Induced Effect	39	\$1,986,631	\$3,682,089	\$6,255,267
<b>Total Effect</b>	<b>107</b>	<b>\$9,625,836</b>	<b>\$19,426,999</b>	<b>\$24,799,839</b>

+ current year dollars

### 2019 New State and Local Alternative Use Tax Estimates<sup>+</sup>

	State tax	Local Tax
Property Tax Estimates	\$0	\$439,669
GA Income Tax Estimate	\$317,653	
Sales Tax Estimates	\$261,499	\$249,736
GA All Other Taxes (estimated at 22% of total GA tax)	\$163,351	
<b>Total State and Local Tax Estimates</b>	<b>\$742,502</b>	<b>\$689,404</b>

+ current year dollars

### 2020 Alternative Use Economic Activity<sup>+</sup>

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	49	\$6,076,488	\$12,909,626	\$14,617,900
Indirect Effect	12	\$802,656	\$1,268,746	\$2,081,583
Induced Effect	35	\$1,788,971	\$3,315,740	\$5,632,900
<b>Total Effect</b>	<b>96</b>	<b>\$8,668,115</b>	<b>\$17,494,112</b>	<b>\$22,332,382</b>

+ current year dollars

### 2020 New State and Local Alternative Use Tax estimates<sup>+</sup>

	State tax	Local Tax
Property Tax Estimates	\$0	\$437,750
GA Income Tax Estimate	\$286,048	
Sales Tax Estimates	\$260,358	\$248,646
GA All Other Taxes (estimated at 22% of total GA tax)	\$154,115	
<b>Total State and Local Tax Estimates</b>	<b>\$700,521</b>	<b>\$686,396</b>

+ current year dollars

**2021 Alternative Use Economic Activity<sup>+</sup>**

<b>Impact Type</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Value Added</b>	<b>Output</b>
<b>Direct Effect</b>	56	\$6,970,301	\$14,808,550	\$16,768,100
<b>Indirect Effect</b>	14	\$920,721	\$1,455,370	\$2,387,770
<b>Induced Effect</b>	40	\$2,052,118	\$3,803,465	\$6,461,463
<b>Total Effect</b>	110	\$9,943,139	\$20,067,385	\$25,617,334

+ current year dollars

**2021 New State and Local Alternative Use Tax Estimates<sup>+</sup>**

	<b>State tax</b>	<b>Local Tax</b>
<b>Property Tax Estimates</b>	\$0	\$441,222
<b>GA Income Tax Estimate</b>	\$328,124	
<b>Sales Tax Estimates</b>	\$262,423	\$250,618
<b>GA All other taxes (estimated at 22% of total GA tax)</b>	\$166,564	
<b>Total State and Local Tax Estimates</b>	\$757,111	\$691,840

+ current year dollars