



**Regional Economic Impacts
in Massachusetts of *Castle
Rock's* First Season**

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OVERVIEW OF ECONOMIC ANALYSIS

Season 1 of *Castle Rock* was the first major scripted series to be produced in Massachusetts in more than 25 years. Produced by Warner Brothers for the streaming platform, Hulu, the production was based at New England Studios in Devens, Massachusetts, with filming taking place in Devens and throughout the state. This report evaluates the economic impacts of the production of *Castle Rock* Season 1 on the Massachusetts economy.

KEY FINDINGS

- *Castle Rock*'s Season 1 spent \$42 million on film and television production tax credit-qualified expenses that contributed directly to the economy of Massachusetts through payments to businesses and individuals in the state in 2017 and 2018.
- These Massachusetts expenditures generated approximately \$69 million in economic activity across a wide range of industries, including rental of real estate and equipment, transportation, food and hospitality, retail, and construction.
- *Castle Rock* created approximately 1,026 full-time equivalent jobs in Massachusetts during its 12 months of production activities.
- Each \$1.00 spent by the production of *Castle Rock* in Massachusetts generated \$1.64 of economic activity in the state.
- Each \$1.00 of tax credit anticipated to be issued by the Commonwealth of Massachusetts related to the production of *Castle Rock* generated approximately \$4.73 of economic activity in the state.
- *Castle Rock* expenditures were distributed across more than 210 towns and cities in Massachusetts (more than half of the towns and cities in the state), including many far from major metropolitan areas.

The success of Season 1 of *Castle Rock* may encourage future productions to locate in Massachusetts. Since *Castle Rock* Season 1, additional scripted series have since been produced in Massachusetts for the growing number of subscription video on demand platforms such as Netflix, Hulu, Apple TV, Disney+, and Quibi. These have included larger productions with lengthy shooting periods that have or may lead to multiple seasons of production in Massachusetts (*Castle Rock* Season 2, *Defending Jacob*, *Kevin Can F*** Himself*, and *The Society*).

CHAPTER 1 | INTRODUCTION AND BACKGROUND

The Massachusetts Production Coalition requested IEc's support in analyzing the regional economic impacts of an individual Massachusetts motion picture production – namely, the first season of the Warner Brothers production *Castle Rock*, a dramatic, scripted television series for Hulu based on the works of Steven King. The first season of *Castle Rock* was in production between March 2017 and February 2018 and premiered on Hulu on July 25, 2018. The production was based at New England Studios in Devens and filming took place there and in 18 other cities and towns in Massachusetts.¹ *Castle Rock*'s first season was the first dramatic, scripted, episodic series to be produced in Massachusetts in more than 25 years. *Castle Rock*'s second season completed production at Devens in October 2019.

RECENT MOTION PICTURE PRODUCTION ACTIVITY IN MASSACHUSETTS

In 2006, the Commonwealth of Massachusetts enacted a film and television production tax credit.² This program includes a 25 percent payroll credit for motion picture projects that spend more than \$50,000 in the state. It also includes a 25 percent production expense credit, as well as a sales tax exemption for any project that spends more than half of its total budget or shoots more than half of its principal photography in Massachusetts (Stout and Rocheleau, 2019). Production expenses include expenditures incurred in Massachusetts during pre-production, production, and post-production and exclude payroll expenses applied to the payroll credit.

Between 2006 and 2008, the three years immediately following the implementation of the tax incentive, there was a 177 percent growth in the motion picture and video production industry and a 126 percent growth in the post-production industry in the state (Foster and Terkla, 2010). Between 2006 and 2016, the period for which we have the most current information, 1,390 individual productions filed with the state for the tax credit. The total amount of direct new spending generated by and eligible for the tax incentive between 2006 and 2016 was \$2.68 billion (DOR, 2020).

From 2006 through 2016, feature length films have generally claimed larger tax credits because they are typically bigger projects with correspondingly bigger budgets and higher in-state expenditures, while other types of motion picture productions are smaller and claim less tax credits per project (DOR, 2020). With the success of Season 1 of *Castle Rock*, multiple scripted series have since been produced in Massachusetts for the growing number of subscription video on demand platforms such as Netflix, Hulu, Apple TV, Disney+, and Quibi. These have included larger productions with lengthy shooting periods that have or may lead to multiple seasons of production in Massachusetts (*Castle Rock* Season 2, *Defending Jacob*, *Kevin Can F*** Himself*, and *The Society*).

¹ Athol, Ayer, Billerica, Boston, Chelmsford, Chelsea, Concord, Everett, Fitchburg, Grafton, Harvard, Lancaster, Malden, Orange, Royalston, Shirley, Tewksbury, Tyngsborough, and Worcester

² Motion pictures include feature films, television series, commercials, and documentaries (DOR, 2020).

SCOPE OF ANALYSIS

This analysis focuses assessing the impact of *Castle Rock*'s first season to the economy of Massachusetts. To estimate this impact, we use expenditure data provided by Warner Brothers to identify which expenditures occurred in Massachusetts. We then apply an “input-output” economic model to analyze how specific project expenditures flow through the Massachusetts economy. We treat Warner Brothers’ expenditure data as the direct economic impacts of *Castle Rock*'s first season and estimate indirect and induced economic impacts using the IMPLAN modeling framework.

Chapter 2 of our report presents the findings of our economic impact analysis. Chapter 3 presents the data we rely upon and the methodology we employ to conduct our analysis.

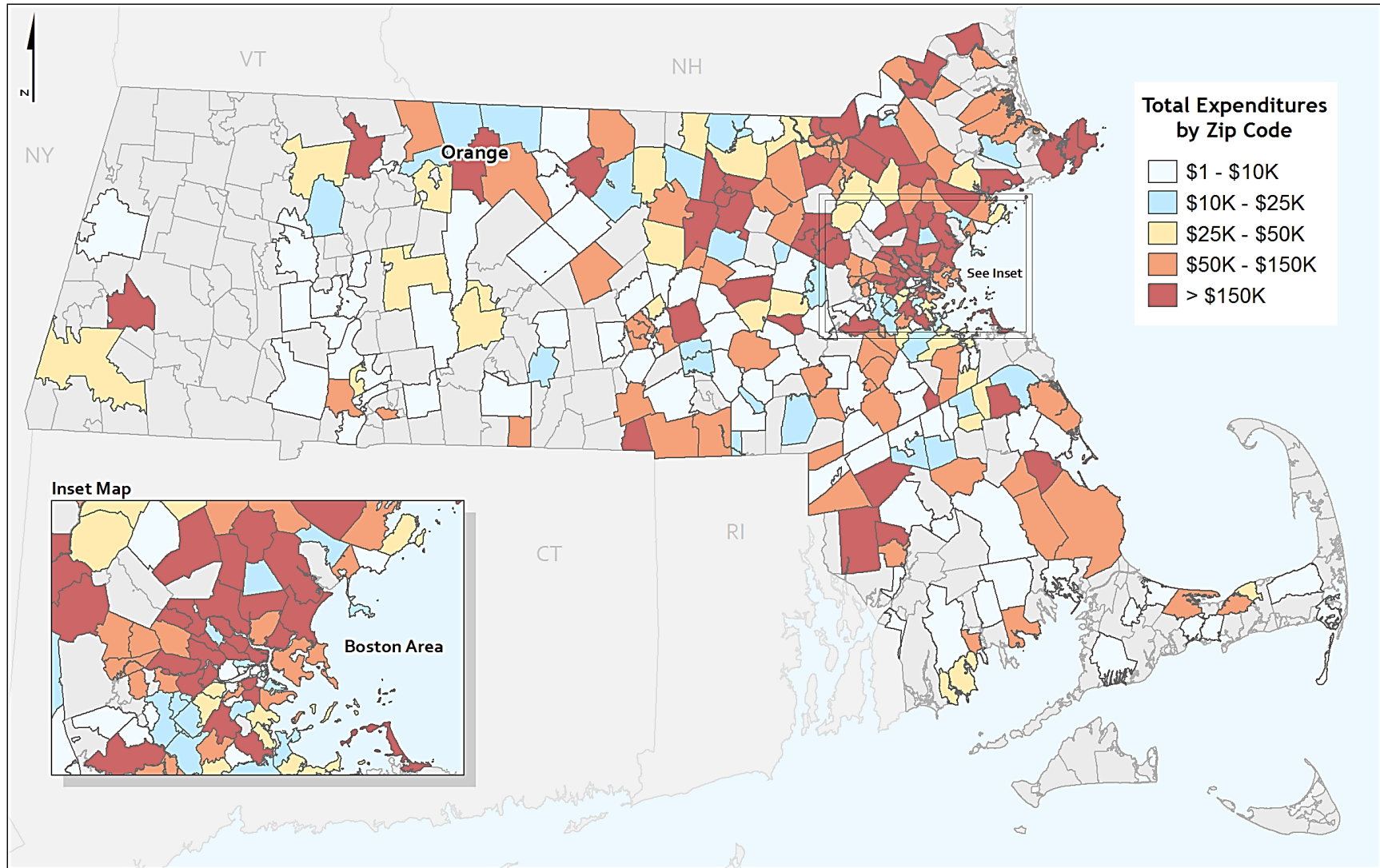
DIRECT PROJECT EXPENDITURES

The production of Season 1 of *Castle Rock* spent approximately \$58 million eligible for the film and television production tax credit. We estimate that approximately \$42 million of this amount consisted of in-state expenditures with a direct impact on the Massachusetts economy.³ According to our analysis of in-state, non-payroll expenditures, *Castle Rock* bought goods and services from vendors in more than 210 cities and towns in the state. As Warner Brothers' data did not include details for all reimbursements to individuals, the total number of vendors in Massachusetts that received direct payments is not known with certainty.

Figure 1 depicts the geographic distribution of expenditures with a Massachusetts address by zip code. *Castle Rock*'s direct expenditures were widely distributed throughout the state, with a notable concentration of economic activity in major urban centers and areas of principal filming. The city of Orange is labeled in Figure 1 because it was one of the first season's principal filming locations. In the cities and towns in the Orange area alone, the production spent more than \$750,000 on location fees to local businesses, residents, and to the town government.

³ Chapter 3 provides a detailed description of the methodology used to estimate in-state expenditures.

Figure 1: *Castle Rock's* First Season Expenditures in Massachusetts by Zip Code



REGIONAL ECONOMIC BENEFITS

Our analysis, conducted using the IMPLAN modeling framework, estimates economic impacts of *Castle Rock* expenditures on four metrics: employment, labor income, value added, and output.

- **Employment** reflects a mix of full-time and part-time job-years⁴ that result from additional employment demand created by a project.
- **Labor Income** captures all employment income received as part of the project-related employment demand, including wages, benefits, and proprietor income.
- **Value Added** reflects the total value of all output or production minus the costs of intermediate outputs (value added is analogous to gross domestic product); Value Added includes payroll taxes, sales taxes, excise taxes, and property taxes, and is approximately equivalent to Gross State Product.
- **Output** reflects the total value of all output or production, including the costs of intermediate and final outputs.

For each of these metrics, IMPLAN breaks the impacts out into direct, indirect, and induced effects:

- **Direct effects** are the production expenditures that directly result from an activity or policy. In this analysis, the direct effects are equal to the costs and labor hours that go into the production of the first season of *Castle Rock*, which we assign to appropriate economic sectors.
- **Indirect effects** are “ripple” impacts that result from changes in the output of industries that supply goods and services to industries that are directly affected.
- **Induced effects** are changes in household consumption arising from changes in employment and associated income that result from direct and indirect effects.

Table 1 presents the results of our economic analysis. The total effects, including direct, indirect, and induced effects, are reported for employment, labor income, value added, and output.⁵ In total, we find that the \$42 million in expenditures within Massachusetts associated with the first season of *Castle Rock* generated regional economic impacts of approximately 1,026 full-time equivalent job-years,⁶ \$38 million in labor income, \$50 million in value added, and \$69 million in total output within the state. In addition,

⁴ IMPLAN defines a “job” as a full-time job lasting 12 months, which is equivalent to two jobs lasting six months each. A job can be either full-time or part time. We convert the IMPLAN job-year results to full-time equivalents using sector-specific conversion factors developed by IMPLAN.

⁵ We note that the total direct output estimated in our IMPLAN model (\$41 million) is slightly less than the total expenditures we estimate to have occurred within Massachusetts (\$42 million). This discrepancy is a result of the methodology we used to compute economic impacts within the IMPLAN framework. Specifically, for “retail” expenditures that occur in Massachusetts, IMPLAN applies a “margin” approach and only counts the retail margin on the good as directly attributable to Massachusetts; the tool conservatively assumes that the remainder of the expenditure was the retailer purchasing the good from outside of Massachusetts, which is excluded from the economic impact results for Massachusetts.

⁶ The IMPLAN output reports 1,144 job-year impacts. We convert the IMPLAN job-year results to full-time equivalents (FTEs), using sector-specific conversion factors developed by IMPLAN in order to present a more widely-used measure of employment.

We estimate that \$42 million of in-state expenditures generated \$3.0 million in state and local tax impacts.⁷

Table 1: Regional Economic Impacts of *Castle Rock* Season 1

Employment (Full-Time Equivalents)	Labor Income	Value Added (Gross State Product)	Output
1,026	\$38,000,000	\$50,000,000	\$69,000,000

Based on these results, we find that *Castle Rock's* first season generated approximately \$1.64 in economic output per dollar spent within Massachusetts.⁸ Assuming that *Castle Rock* will claim a Massachusetts tax credit of approximately \$14.6 million, we estimate that the first season generated approximately \$4.73 in economic output in Massachusetts per tax credit dollar.⁹

Table 2 presents additional detail by breaking out the total effects for the top ten industry sectors, as ranked by output. Consistent with the nature of filming activities, production of *Castle Rock* had the greatest effect on the motion picture and video, commercial and industrial equipment rental, real estate, and transportation industries.

Table 2: Economic Impacts of *Castle Rock's* First Season by Industry Sector in Massachusetts (Ranked by Output)

Sector	Employment (Full-Time Equivalents)	Labor Income	Value Added	Output
Motion picture and video industries	272	\$13,000,000	\$13,000,000	\$14,000,000
Commercial and industrial machinery and equipment rental and leasing	22	\$1,000,000	\$4,000,000	\$7,000,000
Real estate	23	\$0,000,000	\$3,000,000	\$4,000,000
Transit and ground passenger transportation	201	\$3,000,000	\$3,000,000	\$4,000,000
Owner-occupied dwellings	0	\$0	\$2,000,000	\$3,000,000
Construction of other new nonresidential structures	43	\$2,000,000	\$2,000,000	\$2,000,000
Retail - miscellaneous store retailers	84	\$1,000,000	\$1,000,000	\$2,000,000
Specialized design services	84	\$2,000,000	\$2,000,000	\$2,000,000
Hospitals	9	\$1,000,000	\$1,000,000	\$2,000,000
Wholesale trade	6	\$1,000,000	\$1,000,000	\$2,000,000
All Other Sectors	282	\$14,000,000	\$17,000,000	\$28,000,000
Total Effect	1,026	\$38,000,000	\$50,000,000	\$69,000,000

⁷ These state and local tax impacts include sales taxes, property taxes, motor vehicle taxes, corporate income taxes, and personal income taxes.

⁸ \$69 million ÷ \$42.0 million = \$1.64.

⁹ \$69 million ÷ \$14.6 million = \$4.73.

OTHER IMPACTS

This analysis focuses on the near-term regional economic impacts resulting from *Castle Rock*'s within-Massachusetts expenditures. However, additional economic benefits associated with this production may also occur that are not reflected in this analysis. In particular, some analyses have attempted to capture the potential “exposure value” that a production has during its promotion, release, and distribution (e.g., HR&A Advisors, Inc., 2013). The exposure value has been estimated by evaluating the costs that a State would incur to promote itself for tourism purposes to an equivalent audience using conventional advertising channels (*ibid*). Because the setting of *Castle Rock* is not identified as Massachusetts in the context of the series (it is set in Maine), and the content is not of traditional tourism value (a suspense-horror genre production set, at times, in a creepy penitentiary) we have not attempted to quantify an exposure value for Massachusetts associated with this series. However, at least one publication has specifically encouraged visiting Massachusetts to visit the filming locations of *Castle Rock* (Grubbs 2018).¹⁰ Evidence suggests that, indeed, some popular productions have resulted in tourism interest and visitation to scene locations even when the setting does not provide conventional advertising scenery (e.g., *Breaking Bad* and *the Sopranos* have both resulted in local tourism in filming locations).¹¹ To the extent that visitors come to Massachusetts to visit filming locations, these benefits to the state are underreported here.

Using IMPLAN's Massachusetts data, we do not estimate output or economic activity generated by this spending in Massachusetts that may have occurred outside the state – *i.e.*, indirect or induced economic activity that may have “leaked” beyond Massachusetts into neighboring states. We also do not capture economic activity related generated from spending in on the first season of *Castle Rock* outside of Massachusetts, including in other nearby states. As such, the broader regional and national effects of *Castle Rock* spending are not captured in this report.

¹⁰ Grubbs, Jefferson. “Where Is ‘Castle Rock’ Filmed? Set Your GPS For A Creepy, Stephen King-Inspired Road Trip”, *Bustle*, August 28, 2018. Accessed at: <https://www.bustle.com/p/where-is-castle-rock-filmed-set-your-gps-for-a-creepy-stephen-king-inspired-road-trip-10257204>

¹¹ Stephen Kelly, “The Breaking Bad tours driving a tourist boom in Albuquerque”, *the Guardian*, August 2013. <https://www.theguardian.com/travel/2013/aug/11/breaking-bad-tour-albuquerque>; Vanderhoof, Erin. “Ten years later, Albuquerque is still Breaking Bad’s town.” January 2018. Accessed at <https://www.vanityfair.com/hollywood/2018/01/albuquerque-breaking-bad-tourism-10th-anniversary>; Darwish, Meaghan, “7 Sopranos Sites to Visit in Honor of the 20th Anniversary,” January 2019. Accessed at <https://www.tvinsider.com/gallery/sopranos-filming-locations-new-jersey-new-york/>

CHAPTER 3 | DATA AND METHODOLOGY

CASTLE ROCK EXPENDITURE DATA

In support of our economic analysis, Warner Brothers provided comprehensive expenditure data for *Castle Rock*'s first season.

These data include both accounts payable (AP) and payroll expenditures for the entire period of production. The AP data contain Warner Brothers' business expenditures remitted to vendors for goods and services, while the payroll data contain employee compensation (*i.e.*, salaries and fringe benefits) for individuals on *Castle Rock*'s payroll.

The expenditure data report fringe benefits and payroll taxes separately from the payroll and AP expenditure line items with which they are associated. We distribute these fringe benefits and payroll taxes proportionally across the industry sectors we assign to each expenditure line item.

Warner Brothers' data indicate that a total of approximately \$58 million in production expenses are eligible for Massachusetts' film tax credit.¹² Of this \$58 million, \$30 million was reported as having been paid directly to personal or business addresses in Massachusetts. An additional \$28 million was paid to personal or business addresses located out of Massachusetts but was associated with expenditures made in the state.

ESTIMATING TOTAL CASTLE ROCK EXPENDITURES THAT IMPACT MASSACHUSETTS ECONOMY

As noted above, \$30 million of *Castle Rock*'s expenditures were paid directly to personal or business addresses in Massachusetts. Warner Brothers' data report that an additional \$28 million of expenditures are qualified for the tax credit, indicating that some portion of these expenditures occurred in Massachusetts.

In order to not overstate the benefits to the Commonwealth of Massachusetts associated with these out-of-state, tax-credit qualified expenditures, we include only those expenditures which we determine were clearly connected to spending within the state, and therefore contributed to the Massachusetts economy. Our research indicates that approximately \$11.5 million of these additional qualified expenditures contributed to in-state spending,¹³ resulting in total expenditures of \$42 million (72%) that directly impacted the state economy. We discuss our methodology – which differs for AP and payroll data – in detail in the following sections.

¹² Under Massachusetts law non-wage expenditures *do not* have to be purchased from a Massachusetts-based business in order to qualify for a film and television production tax credit; purchases can be made from outside the state and imported into the state. As long as those purchases are used in the Massachusetts-based production, they are considered Massachusetts spending and eligible for the 25% tax credit (Massachusetts Department of Revenue, 2020).

¹³ Expenditures of approximately \$300,000 associated with a Massachusetts address were *not* considered to be qualified for the Massachusetts film and television production tax credit in the Warner Brothers data. These expenditures appear to consist of reimbursements paid to Massachusetts residents for out-of-state expenditures, as well as payroll remitted to Massachusetts for work performed outside the state.

Payroll Expenditures

A number of payroll expenditures in the Warner Brothers data were associated with out-of-state addresses, but were paid for work performed while the employees worked in Massachusetts, and were thus qualified for the tax credit. Payroll expenditures included actors and directors, but also included a wide range of additional labor types associated with construction, transportation, and various other aspects of filming. We recognize that payroll expenditures to employees who spent time in the state during filming but who permanently reside elsewhere would likely not entirely be spent within the state. However, we believe it is reasonable to assume that a portion of these wages would be spent in Massachusetts, even after accounting for “per diem” allowances (included elsewhere in the accounting of expenses) for food and lodging that were paid to some employees.

To estimate the percentage of non-Massachusetts resident payroll expenditures spent in the state, we used Bureau of Labor Statistics (BLS) spending data for the Northeast. BLS’ Consumer Expenditure Surveys publish data on the annual mean household expenditures by region, which estimate the total annual average expenditure and the average expenditures on various goods and services. We assume that the spending patterns of non-Massachusetts residents employed by the project are consistent with individuals in the Northeast region as reflected in the BLS data. We then identify the items that out-of-state residents would have purchased within Massachusetts while working on the project, such as food, apparel, and exclude spending on items that we assume are limited to the employees’ home states, such as housing, healthcare, education, insurance, and similar expenses.

As **Table 3** shows, we estimate that out-of-state residents working in Massachusetts would likely have spent approximately 36 percent of the income received while working on *Castle Rock* in Massachusetts. We therefore include 36 percent of the tax-qualified payroll expenditures associated with non-Massachusetts addresses in our estimate of expenditures contributing to regional economic impacts.

Table 3: Distribution of Payroll Expenditures by Non-Massachusetts Residents by Type and Location, Percent

Item	Percent of Total Payroll Expenditures
Payroll spent in Massachusetts	35.8%
Food	12%
Alcoholic beverages	1%
Apparel and services	3%
Gasoline, other fuels, and motor oil	3%
Other vehicle expenses	5%
Public and other transportation	2%
Medical services	1%
Pharmaceutical drugs	1%
Entertainment	5%
Personal care products and services	1%
Tobacco products and smoking supplies	1%
Miscellaneous expenditures	2%
Payroll spent in home state	64.2%
Total Expenditures	100%

Note: Payroll spent in home state includes housing, vehicle purchases, education, healthcare, and insurance.

Source: U.S. Bureau of Labor Statistics, 2019 and IEc analysis.

AP Expenditures

We also estimate the percentage of invoiced non-payroll expenditures associated with out-of-state addresses that contributed to the Massachusetts economy. To estimate this amount, we examined these purchases line by line in the Warner Brothers expenditure data. We found that many of these apparent out-of-state purchases consist of individual reimbursements for expenses such as car rentals. Other expenses included purchases at in-state branches of national chains for which the address in the expenditure data was a non-Massachusetts address though payments were made in Massachusetts. In total, we estimate that 52 percent of non-payroll, tax-qualified expenditures associated with a non-Massachusetts address were made in Massachusetts, and therefore contributed to the Massachusetts economy.

Table 4: Top Categories of Qualified Non-Payroll Expenditures in Massachusetts

Expenditure Category	Expense	Attributed to MA
Per diem	\$1,300,000	\$500,000
Purchases	\$1,00,000	\$700,000
Camera package	\$700,000	\$0
Outside rentals	\$600,000	\$600,000
Studio equipment rental	\$500,000	\$0
Condors	\$300,000	\$300,000
Hotels/lodging	\$300,000	\$300,000
Guild extras	\$300,000	\$300,000
Gasoline, oil, and mileage	\$200,000	\$200,000
Autos	\$200,000	\$80,000
Cranes	\$200,000	\$0
Other expenses	\$2,500,000	\$1,300,000
Total	\$8,200,000	\$4,300,000

Non-Qualified Expenditures in Massachusetts

Expenditures of approximately \$300,000 associated with a Massachusetts address were *not* considered to be qualified for the Massachusetts film industry tax credit in the Warner Brothers data. These expenditures appear to consist of reimbursements paid to Massachusetts residents for out-of-state expenditures, as well as payroll remitted to Massachusetts employees for work performed outside the state. We assume that these expenses contribute to the Massachusetts economy.

Summary of Castle Rock Expenditures in Massachusetts

As shown in **Table 5**, applying these percentages to the Massachusetts-qualified expenditures associated with an out-of-state address results in a total of \$42 million that we estimate was spent within Massachusetts.

Table 5: Expenditures in Massachusetts

Expenditure Category	AP	Payroll	Total
Expenditures sent directly to Massachusetts personal or business addresses	\$12,600,000	\$17,900,000	\$30,200,000
Additional qualified expenditures in Massachusetts	\$4,300,000	\$7,200,000	\$11,500,000
Total qualified expenditures in Massachusetts	\$16,900,000	\$25,100,000	\$41,700,000

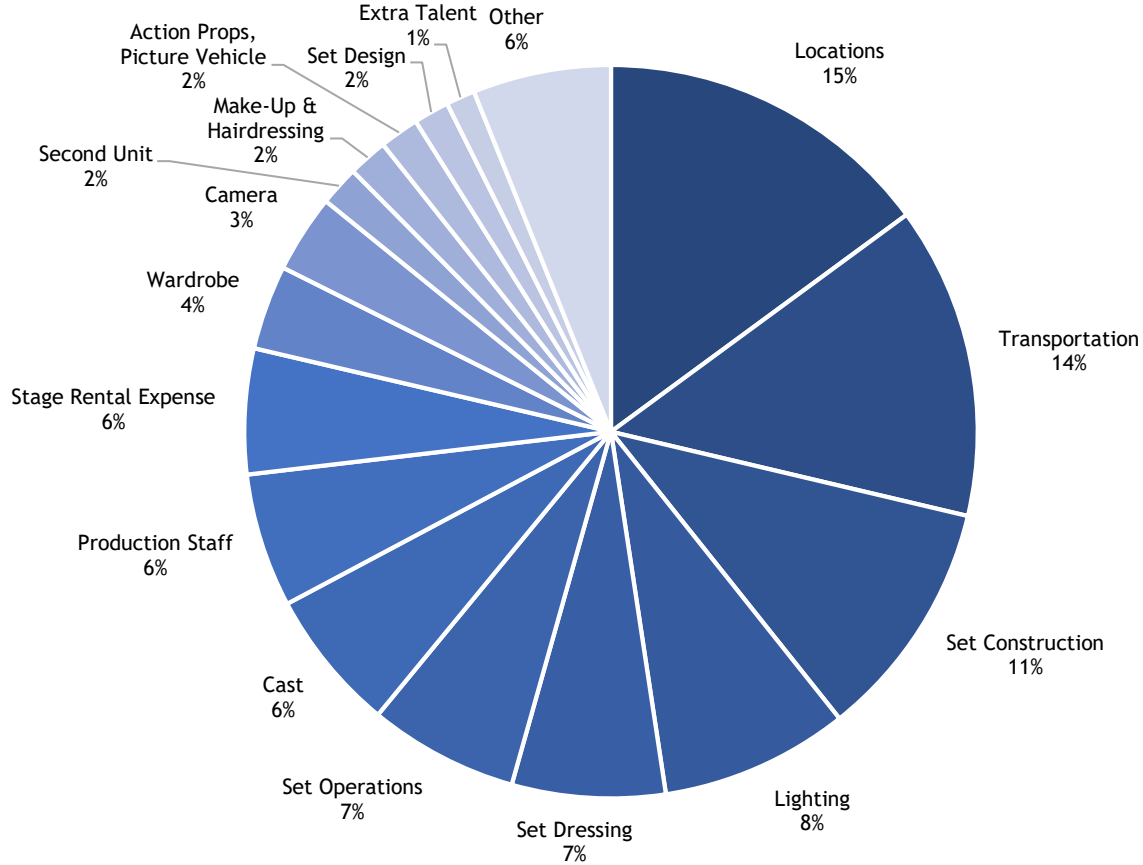
Table 6 summarizes how the approximately \$42 million spent in Massachusetts was distributed on *Castle Rock's* production. As shown, the largest categories of expenditures were location fees (15 percent), transportation (14 percent), and set construction (11 percent). Expenditures within Massachusetts were lower for areas of the production that predominantly occurred in other locations (*e.g.*, special effects and post-production). **Figure 2** depicts this distribution of expenditures graphically.

Table 6: *Castle Rock* Season 1 Expenditures in Massachusetts by Expenditure Category¹

Category	Expenditures	Percent
Locations	\$6,300,000	15%
Transportation	\$5,800,000	14%
Set Construction	\$4,500,000	11%
Lighting	\$3,500,000	8%
Set Dressing	\$2,800,000	7%
Set Operations	\$2,800,000	7%
Cast	\$2,600,000	6%
Production Staff	\$2,500,000	6%
Stage Rental Expense	\$2,300,000	6%
Wardrobe	\$1,600,000	4%
Camera	\$1,400,000	3%
Second Unit	\$736,000	2%
Make-Up & Hairdressing	\$732,000	2%
Action Props, Picture Vehicle	\$730,000	2%
Set Design	\$658,000	2%
Extra Talent	\$536,000	1.3%
Production Sound	\$485,000	1.2%
Property	\$480,000	1.1%
Producers Unit	\$430,000	1.0%
Special Effects	\$424,000	1.0%
Director	\$324,000	0.8%
Set Striking	\$254,000	0.6%
Story, Rights, & Continuity	\$75,000	0.2%
Film Post-Production	\$49,000	0.1%
General Expense	\$27,000	0.1%
Production Film, Lab, & Tech.	\$13,000	0.0%
Total	\$42,000,000	100%

¹ The expenditure categories correspond to top-level expenditure categories in Warner Brothers' chart of accounts.

Figure 2: *Castle Rock* Season 1 Expenditures in Massachusetts by Category



ECONOMIC MODELING FRAMEWORK

In this analysis, we estimate direct, indirect, and induced regional economic impacts of the first season of *Castle Rock* in Massachusetts using the IMPLAN model and Warner Brothers' expenditure data.

The IMPLAN model is a standard input-output model that is used to analyze the economic effects associated with expenditures in one or more sectors of the economy, including how these expenditures indirectly change demand across other related sectors. IMPLAN uses data from several federal agencies, including the U.S. Bureau of Economic Analysis and the U.S. Bureau of Labor Statistics, to model the linkages and spending patterns between different industries in the U.S. economy. These relationships are geography-specific and sector-specific.¹⁴ IMPLAN uses these data to estimate economic impacts by sector and in the aggregate for a specified geographic region.

As noted above, the IMPLAN model estimates economic impacts for four metrics: employment, labor income, value added, and output.

¹⁴ IMPLAN organizes its industry sectors using the North American Industry Classification System (NAICS).

- **Employment** reflects a mix of full-time and part-time job-years¹⁵ that result from additional employment demand created by a project.
- **Labor Income** captures all employment income received as part of the project-related employment demand, including wages, benefits, and proprietor income.
- **Value Added** reflects the total value of all output or production minus the costs of intermediate outputs (value added is analogous to gross domestic product); Value Added includes payroll taxes, sales taxes, excise taxes, and property taxes.
- **Output** reflects the total value of all output or production, including the costs of intermediate and final outputs.

For each of these metrics, IMPLAN breaks the impacts out into direct, indirect, and induced effects:

- **Direct effects** are the production changes or expenditures that directly result from an activity or policy. In this analysis, the direct effects are equal to the costs and labor hours that go into the production of the first season of *Castle Rock*, which we assign to appropriate economic sectors.
- **Indirect effects** are “ripple” impacts that result from changes in the output of industries that supply goods and services to industries that are directly affected.
- **Induced effects** are changes in household consumption arising from changes in employment and associated income that result from direct and indirect effects.

For analyzing the first season of *Castle Rock*, we use the “IMPLAN Online” version of the IMPLAN model. We specify a study area region consisting of the entire Commonwealth of Massachusetts and used the 2017 IMPLAN dataset (the most current available for Massachusetts) to conduct the economic modeling. We inflate the expenditures to 2019 dollars using the Consumer Price Index for all urban consumers to align with IMPLAN’s nominal dollar year (BLS 2019). The methodology we use to conduct our IMPLAN analysis was developed in consultation with an IMPLAN staff economist.

INDUSTRY SECTORS IN ANALYSIS

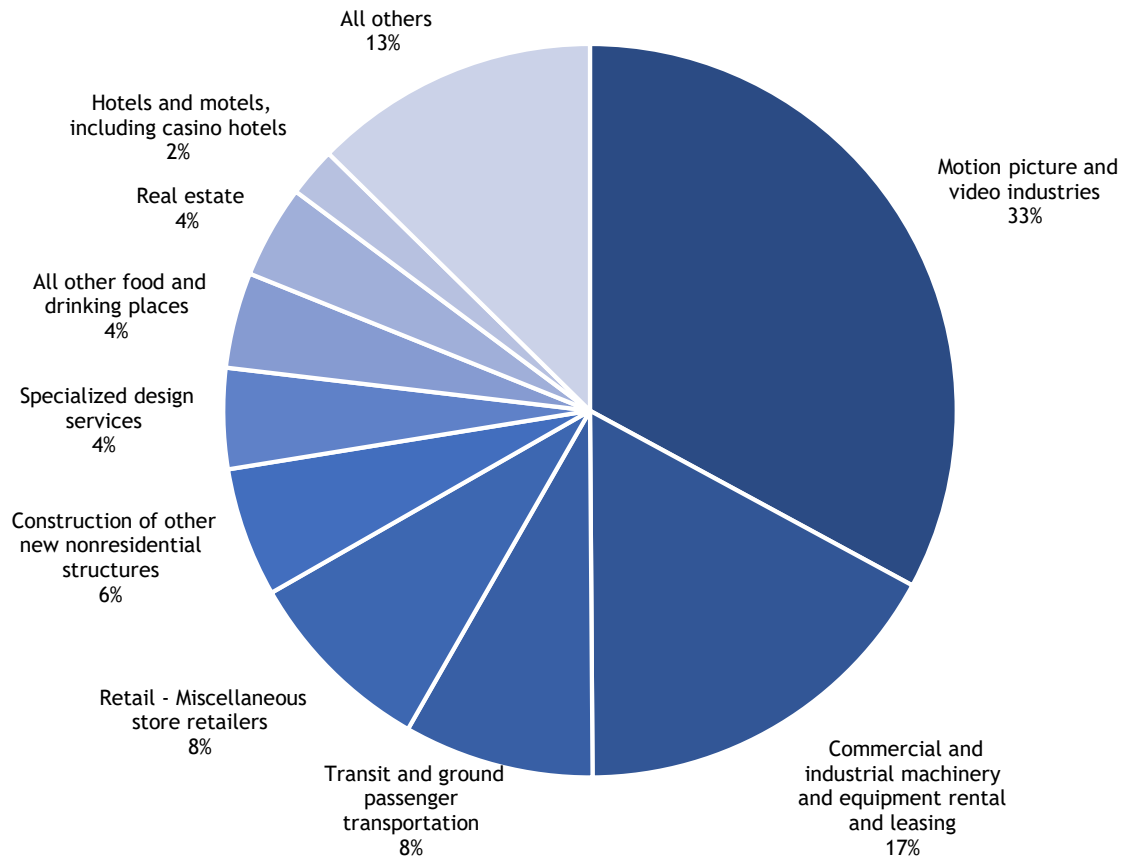
The IMPLAN model uses NAICS and other Bureau of Labor Statistics data to classify all business and government spending into 536 modeled industries. In order to estimate the regional economic impacts of *Castle Rock*’s first season expenditures in Massachusetts, we first need to translate the expenditure categories as they are reported in the Warner Brothers data into industry sectors recognized in the IMPLAN model. To do this, we reviewed data descriptions and payments in the Warner Brothers data to match the expenditure types to IMPLAN sectors. Our review classified the *Castle Rock* expenditures into 44 unique industry sectors in Massachusetts. **Table 7** below summarizes the results of this classification of *Castle Rock* expenditures. After assigning these expenditures to the IMPLAN industry sectors, we modeled the regional economic effects of these expenditures using IMPLAN. In our analysis, we treat AP data as business expenditures and payroll data as employee compensation in the IMPLAN model per the categorization provided in Warner Brothers’ expenditure data.

¹⁵ IMPLAN defines a “job” as a full-time job lasting 12 months, which is equivalent to two jobs lasting six months each. A job can be either full-time or part time. We convert the IMPLAN job-year results to full-time equivalents using sector-specific conversion factors developed by IMPLAN.

Table 7: *Castle Rock Expenditures Classified by IMPLAN Industry Sector*

Sector	AP	Payroll	Total
Motion picture and video industries	\$1,100,000	\$12,700,000	\$13,800,000
Commercial and industrial machinery and equipment rental and leasing	\$6,900,000	\$205,000	\$7,100,000
Transit and ground passenger transportation	\$135,000	\$3,400,000	\$3,500,000
Retail - Miscellaneous store retailers	\$3,000,000	\$531,000	\$3,600,000
Construction of other new nonresidential structures		\$2,400,000	\$2,400,000
Specialized design services	Less than \$1 thousand	\$1,900,000	\$1,900,000
All other food and drinking places	\$1,200,000	\$534,000	\$1,800,000
Real estate	\$1,500,000	\$177,000	\$1,700,000
Hotels and motels, including casino hotels	\$914,000		\$914,000
Personal care services	\$23,000	\$637,000	\$660,000
Management consulting services	\$23,000	\$606,000	\$629,000
Greenhouse, nursery, and floriculture production		\$376,000	\$376,000
Automotive equipment rental and leasing	\$216,000	\$168,000	\$384,000
Accounting, tax preparation, bookkeeping, and payroll services		\$330,000	\$330,000
Investigation and security services	\$309,000		\$309,000
All other sectors ¹	\$1,500,000	\$1,100,000	\$2,600,000
Total Expenditures	\$16,900,000	\$25,100,000	\$41,700,000
¹ Remaining expenditures were distributed across 29 additional IMPLAN sectors including (1) retail gasoline stations, (2) office administrative services, and (3) commercial and industrial machinery and equipment repair and maintenance, among others.			

Figure 3: *Castle Rock* Expenditures, Classified by IMPLAN Industry Sector



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