



UNIVERSITY OF MASSACHUSETTS SCHOOL OF PUBLIC HEALTH AND HEALTH SCIENCES

Social and Economic Impacts of Expanded Gambling in Massachusetts: 2018

**Report to the Massachusetts Gaming
Commission & the Massachusetts Department
of Public Health**

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EXECUTIVE SUMMARY

Casino gambling was legalized in Massachusetts in 2011. To date, one slot parlor—Plainridge Park Casino—has opened in 2015 and two casinos are being built—MGM Springfield and Encore Boston Harbor—with tentative opening dates of August 2018 and June 2019 respectively. In 2013, a contract was awarded to the authors of the present report to investigate the impacts of these new facilities. This investigation is known as the Social and Economic Impacts of Gambling in Massachusetts (SEIGMA) study, and it constitutes the most in-depth and comprehensive investigation of the impacts of introducing casino gambling ever undertaken.

Extensive primary and secondary data have been collected to inform these impacts. The present report is the first in a series of reports that will document changes in the social and economic landscape in Massachusetts that can potentially be attributed to the introduction of these new gambling venues. It is important to recognize that the impacts of casino gambling in Massachusetts in 2018 are likely not reflective of the impacts that will be seen in future years. This is because the only significant changes that have occurred to date are the construction impacts of building the three facilities as well as the opening of the Plainridge Park Casino (PPC) (the smallest of the three new venues) in June 2015. Indeed, other than the very clear revenue, employment, and spending of PPC, there is little evidence of marked socioeconomic changes to date in Massachusetts that can be attributed to gambling. However, the purpose of the present report is not just to report impacts to date, but also to a) provide comprehensive documentation of baseline social and economic indices; b) integrate findings from our various standalone social and economic reports in the last four years; c) crystallize the template for reporting future impacts; and d) identify gaps in our analyses to be addressed in future work.

Social and Health Impacts

As of mid-2018 (i.e., after the opening of Plainridge Park Casino and prior to the opening of MGM Springfield and Encore Boston Harbor), the evidence indicates the following:

- There has been no significant change in the prevalence of problem gambling or related indices (treatment seeking, bankruptcy, divorce/separation, suicides) at either a state level or in the PPC Host and Surrounding Communities (H&SC). In the case of the PPC H&SC this is likely due to the fairly high population level of casino gambling that existed prior to the introduction of the PPC that is related to the close proximity of Rhode Island and Connecticut casinos that have been in operation since the early 1990s.
- There has been no significant change in the overall amount of crime at a state level or in the PPC H&SC. However, there has been an increase in credit card fraud and reports of lost property, suspicious activity, and traffic complaints in the Town of Plainville that can likely be attributed to the PPC. These increases, in turn, are largely attributable to an increased volume of visitors to the area.
- There has been a significant change in both statewide and regional attitudes towards gambling that likely reflects greater satisfaction with the current gambling landscape. Both in the state and in the PPC H&SC a greater portion of people now report being satisfied with the availability of gambling. Similarly, at a statewide level, a smaller portion of people now express the opinion that all forms of gambling should be legal. An additional statewide change is that fewer people indicate the benefits of gambling are equal to the harms. In the PPC H&SC, there has been a decrease in the percentage of people who believe casinos will be beneficial to Massachusetts and an increase in the percentage of people with more neutral opinions about PPC (i.e., more people believing it will be neither beneficial or harmful).
- There has been no significant change in population health (health, happiness, stress, substance use, addictions) at either a statewide level or in the PPC H&SC that can be attributed to casino introduction. While there may be a slight increase in overall gambling participation and number of formats engaged in

within the state, overall intensity of gambling participation may have declined somewhat, and there has been no change in overall gambling involvement in the PPC H&SC.

- There has been no change in the broader population demographics at either a statewide level or in the PPC H&SC that can be attributed to casino introduction.
- There has been no change in traffic or noise at a statewide level attributable to casino introduction, but there has been an increase in traffic volume, traffic complaints, and noise complaints (during construction) in the Town of Plainville and an increase in traffic volume in the City of Everett.

Economic and Fiscal Impacts

As of mid-2018 (i.e., after the opening of Plainridge Park Casino and prior to the opening of MGM Springfield and Encore Boston Harbor), the evidence indicates the following:

- The building of all three casinos has had significant direct economic benefits. All three casino companies have spent a considerable amount of money within the state building these facilities and employing a large local workforce in the construction. This amounted to \$150.2 million for PPC, with nearly 87% of this being spent in the state and approximately 81% of the construction workforce being from Massachusetts.
- The operation of PPC is also creating significant economic benefits, as most of the \$176 - \$186 million annual revenue appears to represent new money from 'recaptured' Massachusetts casino patrons (i.e. Massachusetts residents who reported they would have gambled out-of-state if not for PPC) and out-of-state patrons. Furthermore, the large majority of this revenue stays in the state. Of the \$129.5 million in operational expenses (taxes, wages, supplies) in PPC's first year of operation, 87% was spent within Massachusetts. Also, slightly more than 500 people have ongoing employment at the casino, with approximately 71% being in-state employees. A significant portion of these are 'new' jobs as people taking the positions were either unemployed or working part-time prior to beginning work at the casino.
- At a statewide level there has been no impact on the total number of business establishments or other industry sectors (including gambling), with the exception of horse racing, where the Race Horse Development Fund (from taxes on casino revenue) has likely contributed to an increase in overall wagering amounts. At a regional level there is no strong evidence that the overall number of businesses has significantly changed as a direct result of the new casinos or that the construction and/or operation of these casinos has differentially impacted certain types of businesses. However, there has been some rejuvenation of racing at Plainridge Racecourse.
- There has been no impact on statewide wages or poverty rates. There has been a slight increase in wages and slight decrease in poverty rate in Plainville, but it is uncertain whether this is attributable to the casino. There is reason (and evidence) to believe that gambling is somewhat regressive (i.e., people with lower incomes paying proportionally more of their incomes), but no analysis has yet been conducted to determine whether expanded casino gambling has increased or decreased this tendency.
- There is no evidence of a statewide impact on real estate property values, residential building permits, or rental costs. Similarly, at a regional level it is unlikely that PPC has impacted property values or rental costs.
- Government impacts from casino gambling have not been extensively analyzed. However, it is clear that some regulatory costs are incurred at a state level that are offset by revenue from casino business taxes and licensing fees. At a regional level there are some financial costs in the community hosting the casino due to strain on infrastructure and local government services as well as the fact that the local populace will disproportionately contribute to casino revenue. However, this is offset by revenue from Host and Surrounding Community agreements with the casino, casino property taxes, and Local Aid from the state government from taxes on casino gross gaming revenue.

INTRODUCTION

In November 2011, an [Act Establishing Expanded Gaming in the Commonwealth](#) was passed by the Legislature and signed by Governor Deval Patrick (Chapter 194 of the Acts of 2011). This legislation permitted casinos and slot parlors to be introduced in Massachusetts under the regulatory auspices of the Massachusetts Gaming Commission (MGC). The Expanded Gaming Act also required MGC to establish “an annual research agenda” to understand the social and economic effects of casino gambling. In March 2013, MGC awarded a contract to a team at the University of Massachusetts Amherst to conduct this research. This research project is known as the Social and Economic Impacts of Gambling in Massachusetts ([SEIGMA](#)) study.

SEIGMA was originally envisioned as a discrete before/after evaluation of the impact of the introduction of casinos into Massachusetts. However, with the gradual introduction of the new casinos over an extended period of four years (2015 - 2019), a decision was made to produce periodic reports that comprehensively documented the known impacts *every two to three years*, with the first report occurring in 2018. Much of the impacts of new forms of gambling typically occurs in the first few years after introduction, so waiting until after all the casinos have opened might miss impacts happening as a result of the 2015 introduction of the first casino in Plainville. By the same token, some impacts take several years to fully manifest themselves and so a singular evaluation in 2020 would miss these changes.

Periodic reports that document impacts at different time points also better capture the dynamic changes and trends that are occurring. The reality is that the availability and provision of legal gambling in Massachusetts has always been in flux and will likely continue to be in the future. For example, there has been a dramatic decrease in the number of bingo halls and horse race tracks in the past 20 years; simulcast wagering on horse and dog racing was introduced in 1983; the Massachusetts Lottery has added several new products (e.g., instant lotteries, multi-state lottery); Keno was introduced to bars in the 1990s; dog racing was banned in 2009; people started accessing offshore online gambling beginning in the late 1990s. While casino introduction between 2015 – 2019 does represent a major change, additional casinos may be introduced into Massachusetts at some future point and/or in neighboring states. Online gambling and/or sports betting may be legalized in the future. New forms of gambling are constantly emerging and becoming available; recent examples include daily fantasy sports, esports, financial indices betting, and skill-based electronic gambling machines. At the same time, efforts to mitigate the negative impacts of gambling are changing and evolving. Various responsible gambling initiatives are being introduced (e.g., GameSense) and more will likely be developed as time goes on. Finally, there are background contextual factors that moderate all these changes/impacts (e.g., economic upturns and downturns; legalization of cannabis, etc.).

Not only do periodic reports provide a more comprehensive documentation of the dynamic changes and trends that are occurring, they also substantially enhance the value of the research. Even the most substantial high-quality studies (e.g., National Gambling Impact Study Commission, 1999) eventually become dated and obsolete, whereas the present approach ensures that research findings remain current and policy relevant.

There are five main sections to the present report:

1. A brief **history of legal gambling in Massachusetts** and its current availability to contextualize the changes in gambling availability that are presently occurring.
2. A discussion of the **theoretical framework utilized** in the present report to analyze casino impacts as well as the methodological principles adhered to.
3. A brief description of the **main data sources** employed in our analysis.

4. The **impact section**, which serves as the main body of the report. Our impact analysis is comprised of two subsections, one on Social and Health Impacts and the other on Economic and Fiscal Impacts. Within each of these subsections there are categories and subcategories of impacts. Within each subcategory, 'statewide' and 'regional' impacts are reported. Because of the large amount of data as well as the many different impact areas, each impact section presents a condensed and largely descriptive reporting of the evidence.
5. Lastly, a detailed **summary of our findings**.

The information contained in the present report is a compilation of primary data extracted from existing SEIGMA reports, publicly available secondary data, information extracted from other agency reports, and a small amount of newly collected SEIGMA primary data. The data source is reported in all instances. Data is presented at the city/town level or host and surrounding community level when available. However, for many impacts county-level or larger regional-level data is all that could be obtained. When available, data prior to 2015 is presented as well as data for year's post-2015. However, there are some impact areas where data is not available prior to 2015 and some impact areas where data is not available after 2015. As will be seen, for some impact areas the data is limited and/or the ability to attribute changes to casino introduction is tenuous, whereas for other impact areas the data is rich and the ability to attribute observed changes to casino introduction is strong.

The conventions utilized in reporting results are as follows:

- The term 'significant difference' is used primarily to signify statistically significant differences, usually at the $\alpha = .05$ level. It should be noted that although the present report utilizes statistical significance to highlight ostensibly important results, the large sample sizes in several of the analyses resulted in statistically significant differences that were small in magnitude. This is pointed out, when appropriate.
- When cell sizes are between 1 and 4 the actual value is suppressed and replaced with the range '1-4'.
- To avoid the use of extensive appendices, there are some results presented in the text of the report which are not also displayed in a table or graph. For a similar reason, most figures also contain the raw data.
- Term 'weighted' in a table or figure indicates the use of sampling weights to align the sample to the known population.
- The Host and Surrounding Communities associated with a casino are referred to with the acronym H&SC. When the terms 'area' and 'region' are used it is to denote a different geographic level.

HISTORY OF LEGAL GAMBLING IN MASSACHUSETTS

The indigenous peoples of North America (and New England) have a long cultural history of gambling prior to European colonization (Culin, 1907; Salter, 1974, 1980; Williams, Stevens & Nixon, 2011). Gambling was also common in colonial New England among European immigrants who brought their gambling traditions with them, with horse racing, cockfighting, bullbaiting, card games, dice games, and raffles/lotteries being particularly popular (Findlay, 1986; Schwartz, 2006). Indeed, legal lotteries played an important role in colonial America (including Massachusetts) in financing both private and public ventures such as roads, colleges, libraries, and military ventures as an alternative to direct taxation (Rabushka, 2010; Schwartz, 2006). Nevertheless, there have always been certain segments of society that opposed gambling and total bans and/or bans on certain types did periodically occur. One of those periods was the late 1890s when a combination of religious denouncement and lottery scandals contributed to the eventual banning of virtually all forms of gambling in most of the United States (Schwartz, 2006; Thompson, 2001).

HORSE AND DOG RACING

On-site pari-mutuel wagering on horse and dog races was re-legalized in Massachusetts in 1934 to support agriculture, improve horse breeding, and to raise government revenue (General Court of Massachusetts, 1934a; Abt, Smith & Christiansen, 1985). Since that time, live racing has been continuously available at several race tracks and agricultural fairs within the state (Temple, 2009, 2010). In 1983, simulcast wagering was also legalized, permitting racetracks to broadcast and accept bets on horse and dog races occurring at tracks outside Massachusetts. A decline in racing revenue and attendance began in the 1980s (Temple, 2009, 2010). Furthering this decline was the fact that live dog racing was banned in 2009 causing the closure of the state's two greyhound tracks (Moskowitz, 2009). To help support the remaining horse racing industry 18% of gross profits on slots and electronic table games at the new PPC (and 2.5% from MGM Springfield and Encore Boston Harbor casinos) goes to the [Race Horse Development Fund](#) which was created as part of the Expanded Gaming Act to support the horse racing industry.

As of 2018, live horse racing exists only at Plainridge Racecourse in Plainville (in the form of harness racing) from April - November, with simulcast wagering being available year-round. Slot machines, electronic table games, and lottery ticket terminals were added to this facility in June 2015, resulting in a name change to [Plainridge Park Casino](#). Simulcast wagering also currently exists in Massachusetts at [Raynham Park](#) in the Town of Raynham and [Suffolk Downs](#) in East Boston.

In 2016, the total amount wagered on horse racing was \$229,353,353, with the vast majority wagered on simulcast racing (98.8%) rather than live racing (1.2%), and with 62% of this being wagered at Suffolk Downs (MGC, 2016). The takeout rates (percentage of the betting pool that is retained by the racetrack) in Massachusetts are [19%](#) for bets on win, place, and show and [26%](#) of the total wagered on all other types of bets, resulting in payback rates to the bettor of 81% and 74% respectively.

The legal age to bet on horse and dog races in Massachusetts is 18. The Massachusetts Gaming Commission Division of Racing is responsible for regulating the Massachusetts horse racing industry.

CHARITABLE GAMBLING

Partly due to the economic problems associated with the Great Depression, bingo (historically known as 'beano') was legalized in 1934 contingent on the revenue being directed to charitable, civic, educational, fraternal or religious organizations and a license being granted by the local municipality (General Court of Massachusetts, 1934b; Pender et al., 2014). Bingo was banned again in 1943 due to the involvement of organized crime, but re-legalized in 1971.

In 1969, these same community groups, as well as veteran's organizations and a wider range of service organizations and clubs (collectively known as 'charitable groups'), were permitted to also conduct 'raffles and bazaars',¹ again contingent on a license being granted by the local municipality (General Court of Massachusetts, 1969). These raffles and bazaars are generally specific to the local town or city where the license is issued and have taken the form of a) small scale lotteries with either cash or merchandise prizes, b) instant lottery tickets ('break-open tickets', 'pull-tabs', 'charity tickets'); and c) short-term 'casino events' that involve the provision of casino table games.

In 2016, Massachusetts residents spent \$59,533,184 on charitable gambling, with 45.3% of this on bingo, 32.3% on raffles, 21.8% on instant lottery tickets, and 0.6% on casino events. In 2016 the payback rate was 78% for bingo, 60% for instant lottery tickets, and approximately 42%² for raffle tickets (Massachusetts State Lottery Commission, 2016a). In 2016 there were 127 licensed bingo operators in the state (Massachusetts State Lottery Commission, 2016a). Bingo revenue and participation have been in decline since the mid-1980s. At its peak in 1984, gross bingo revenue was \$180.3 million with 916 different organizations operating bingo games in the state (The Patriot Ledger, 2017).

The legal age to participate in charitable gambling in Massachusetts is 18. The Charitable Gaming Division of the Massachusetts State Lottery Commission is responsible for regulating charitable gambling.

LOTTERY

The lottery was legally reinstated in Massachusetts in 1971 to generate revenue for the 351 cities and towns in the state. Using a formula established by the Legislature, cities and towns receive approximately 20% of annual lottery sales. These funds are not earmarked for any specific programs which allows the cities and towns to decide how they wish to spend the funds. Starting with a weekly draw game in 1972, the Lottery has added numerous other products, most notably instant lottery tickets in 1974 (the first U.S. state to do so), a daily numbers game in 1976, and a variety of traditional, large jackpot games in the 1980s and 1990s. In 1993, the Lottery introduced an electronic version of Keno, which is offered every few minutes on monitors in

¹ Raffles being legally defined as the selling of tickets for prizes that are awarded based on chance and bazaars being legally defined as a place maintained by the sponsoring organization to hold chance-based gambling events.

² The payback percentage for raffles is somewhat lower than 42% as the return-to-player amount includes administrative expenses that are deducted from the amounts returned to players.

approximately 1,200 bars, restaurants, and similar establishments around the state. In 1996, the Lottery joined five other states to create a multi-state lottery game that allowed for much larger maximum prizes. The Massachusetts Lottery maintains a statewide network of approximately 8,000 retail sales agents, including chain stores, supermarkets, gas stations, convenience stores, and corner stores. These retailers earn commissions on lottery sales and bonuses on prizes claimed.

In fiscal year 2017, Massachusetts residents spent \$5,097,765,000 on lottery products with 69% of this being on instant lotteries and 18% on Keno (Massachusetts State Lottery Commission, 2017a). For many years Massachusetts has had the highest per capita spending on lottery games in the United States (LendEDU, 2017) as well as providing the highest overall payback percentage on its games (over 75%) (Schoen, 2016).

The legal age to purchase lottery products in Massachusetts is 18. The Massachusetts State Lottery Commission is responsible for regulating the Massachusetts lottery.

CASINOS

Casinos and other venues providing electronic gambling machines (EGMs) and/or casino table games have been pervasively available in all neighboring states except Vermont long before their legalization in Massachusetts.

In Rhode Island, Lincoln Park racetrack (now Twin River Casino) and Newport Jai Alai (now Newport Grand Casino) added video lottery terminals in 1992. Table games were added to Twin River Casino in 2013. Tiverton Casino Hotel (owned by Twin River) recently opened in September 2018 and has 1,000 electronic gambling machines and 32 table games.

In Connecticut, Foxwoods Casino introduced table games in 1992 and slot machines in 1993, and Mohegan Sun opened in 1996 with both table games and slot machines. For many years the tribally-owned Foxwoods Casino and Mohegan Sun were the largest casinos in the world, and they continue to be among the largest. A future casino close to the Massachusetts border in East Windsor is also being planned.

In New York State several tribally-owned casinos opened beginning in 1993, and video lottery terminals were added to nine different New York state racetracks beginning in 2001. Additional large-scale casinos have been added in recent years. This includes the \$510 million Resorts World New York City in 2011, the Rivers Casino and Resort in Schenectady in 2017, and the \$1.2 billion Resorts World Catskills that opened in Monticello in February 2018.

In New Hampshire, several different venues have been providing casino table games and a limited number of electronic gambling machines for many years, operating under their charitable gambling laws.

Maine has had casinos with slot machines and table games since 2005.

Of final note, casino cruises operated out of Massachusetts ports from 1998 to 2013 (Wikipedia, 2018). These ships provided slot machines and casino table games to customers once they were at least three nautical miles from the coast where federal rather than state laws applied. No casino cruises are currently in operation.

Table 1 is a list of all venues within 200 driving miles of the Massachusetts state line that provide electronic gambling machines (slots, video poker, etc.) and/or casino table games (including poker).

Table 1. Venues Containing Electronic Gambling Machines and/or Casino Table Games within 200 Miles of MA State Line in September 2018

State	Facility	Date First Providing EGMs &/or Table Games	Current Square Footage	Current # EGMs	Current # Table Games	Driving Distance (miles) from MA State Line
Rhode Island	Twin River Casino	1992 ^e	300,000 ^c	4,200 ^c	113 ^c	4.3
Rhode Island	Newport Grand Casino (closed Aug 28, 2018)	1992 ^a	50,000 ^b	1,100 ^d	0 ^d	16.3
Rhode Island	Tiverton Casino Hotel (opened Sep 1, 2018)	2018 ^a	95,000 ^a	1,000 ^a	32 ^a	0.7
Connecticut	Foxwoods Resort Casino	1992 ^a	345,000 ^b	4,800 ^b	380 ^b	42.2
Connecticut	Mohegan Sun	1996 ^a	364,000 ^b	5,532 ^b	377 ^b	48.0
New York	Vernon Downs & Casino	NA	34,500 ^b	767 ^b	NA	137.0
New York	Monticello Gaming & Raceway	NA	40,000 ^b	1,550 ^b	NA	92.4
New York	Turning Stone Resort & Casino	1993 ^b	125,000 ^c	2,080 ^b	122 ^c	140.0
New York	Saratoga Casino & Raceway	2004 ^a	55,000 ^c	1,700 ^d	NA	50.2
New York	Empire City Casino at Yonkers Raceway	2006 ^a	120,000 ^b	5,300 ^b	0 ^d	89.3
New York	Resorts World New York	2011 ^a	330,000 ^b	4,995 ^b	475 ^b	116.0
New York	Yellow Brick Road Casino	2015 ^b	67,000 ^c	447 ^c	14 ^b	160.0
New York	Tioga Downs & Casino	2016 ^b	32,000 ^c	950 ^b	35 ^c	191.0
New York	Jake's 58 Hotel & Casino	2017 ^b	18,656 ^b	1,000 ^b	0 ^b	134.0
New York	Rivers Casino & Resort	2017 ^b	50,000 ^b	1,150 ^b	82 ^c	42.5
New York	Resorts World Catskills	2018 ^b	100,000 ^b	2,150 ^b	164 ^b	85.4
New York	Point Place Casino	2018 ^b	65,000 ^b	500 ^b	20 ^b	159.0
New Hampshire	Seabrook Poker Room	2006 ^b	9,125 ^c	0 ^d	9 ^d	1.7
New Hampshire	River Casino	2008 ^d	8000 ^d	0 ^d	17 ^d	5.0
New Hampshire	Keene Casino	2009 ^d	NA	0 ^d	3 ^d	14.4
New Hampshire	Manchester Poker Room	2010	NA	0 ^d	8 ^d	19.9
New Hampshire	Lakes Region Casino	2011 ^a	35,000 ^c	NA	17 ^c	58.9
New Hampshire	Aces and Eights at Hampton Beach Casino	2014 ^b	NA	NA	20 ^c	2.9
New Hampshire	Chaser's Poker Room & Casino	2017 ^b	NA	0	7 ^d	2.1
New Hampshire	Cheers Poker Room & Casino	2017 ^b	NA	0	37 ^b	4.4
New Hampshire	Boston Billiard Club & Casino	2017 ^a	NA	0 ^b	15 ^b	3.3
Maine	Hollywood Casino Hotel & Raceway Bangor	2005 ^a	30,000 ^b	923 ^b	18 ^c	194.0
Maine	Oxford Casino	2012 ^b	35,000 ^c	871 ^c	28 ^c	96.9
Pennsylvania	Mohegan Sun at Ponoco	2006 ^a	82,000 ^c	2,332 ^c	91 ^c	175.0
Pennsylvania	Mount Airy Casino Resort	2007 ^a	65,144 ^c	1,868 ^c	81 ^c	150.0
Pennsylvania	Parx Casino and Racing	2009 ^b	260,000 ^c	3,500 ^b	173 ^c	195.0
Pennsylvania	Sands Casino Resort Bethlehem	2009 ^b	139,000 ^b	3,000 ^b	237 ^c	180.0

Source: a = online news report; b = World Casino Directory; c = CasinoCity.com; d = verified via phone call from SEIGMA team; e = Wikipedia; NA = not available.

Within Massachusetts, casinos were not permitted until 2011 when the [Act Establishing Expanded Gaming in the Commonwealth](#) permitted casinos and slot parlors to be introduced in Massachusetts under the regulatory auspices of the Massachusetts Gaming Commission (MGC). Three casino licenses were available, with one allocated for the Greater Boston region (Region A), one for Western Massachusetts (Region B), and one for Southeastern Massachusetts (Region C). A single license for a slot parlor was also available, with no geographic restriction as to its location. The three regions defined in the legislation (and the counties they include) are illustrated in Figure 1.

As of 2018, two casino applications and one slot parlor application have been approved and one facility (slot parlor) has opened. To date, no casino application has been approved for Region C (southeastern Massachusetts). The details of these approved venues are contained in Table 2, Table 3, and Table 4 and their geographic location is shown in Figure 2 and Figure 3. These figures also illustrate the 'host' community where the casino is/will be located and the 'surrounding communities', which are defined as municipalities proximate to a host community which the Massachusetts Gaming Commission deems likely to experience impacts from the new venue.

The legal age to gamble at a casino in Massachusetts is 21.

OTHER TYPES OF GAMBLING

As of September 2018, there is no legal online gambling and no legal sports betting in Massachusetts. One exception to this is fantasy sports betting, which is conducted online and legalized in August 2016 (restricted to age 21 and older).

Figure 1. The Three Regions as Defined in the Massachusetts Expanded Gaming Act



Table 2. Plainridge Park Casino

Venue	Host Community	Surrounding Communities	Opening Date	Current Gambling Availability	Current Amenities	Owners	Notes
Slot Parlor	Town of Plainville	Attleborough Foxborough Mansfield North Attleborough Wrentham	June 24, 2015 (has been open for racing since 1999)	1,249 slot machines and electronic table games; several instant ticket and lottery ticket terminals; 5/8-mile live harness racing track + simulcast betting	Several restaurants, bars, and food court eateries, with nightly entertainment available at one of its lounges. 1,620 parking spaces. 55,000 sq ft clubhouse for simulcast operations and live race viewing.	Owned and operated by Penn National Gaming . Corporate headquarters in Pennsylvania. Owns 28 other gambling venues in 16 states and 1 Canadian province.	Opened initially in 1999 as a seasonal harness racing track with additional simulcast betting. Casino expansion cost \$150.2M. 196,000 sq ft area for casino operations.



Table 3. MGM Springfield

Venue	Host Community	Surrounding Communities	Opening Date	Gambling Availability	Amenities	Owners	Notes
Region B Casino	City of Springfield	Agawam Chicopee East Longmeadow Holyoke Longmeadow Ludlow Wilbraham West Springfield	August 24, 2018	3,000 slot machines, 100 table games, poker room.	Hotel with 250 rooms, meeting and convention space, spa, movie theatre, retail and restaurant space. ~3,600 parking spaces.	Owned and operated by MGM Resorts International with corporate headquarters in Las Vegas. Owns several destination casino resorts in Las Vegas, as well as venues in 4 other states and China.	Estimated to cost \$960M. 850,000 sq ft in total.



Table 4. Encore Boston Harbor

Venue	Host Community	Surrounding Communities	Projected Opening Date	Projected Gambling Availability	Projected Amenities	Owners	Notes
Region A Casino	City of Everett	Boston Cambridge Lynn Malden Medford Melrose Somerville	June 2019	3,242 slot machines, 168 table games, poker room.	Hotel with 671 rooms, meeting and convention space, spa, retail and restaurant space. 3,731 parking spaces (2,931 on-site).	Owned and operated by Wynn Resorts with corporate headquarters in Las Vegas. Owns 2 destination resorts in Las Vegas and 3 in Macau.	Estimated to cost \$2.4B. 3,100,391 sq ft in total. Recent name change from 'Wynn Boston Harbor'.



Figure 2. Location of the Three Existing and/or Future Casinos in Massachusetts as of September 2018

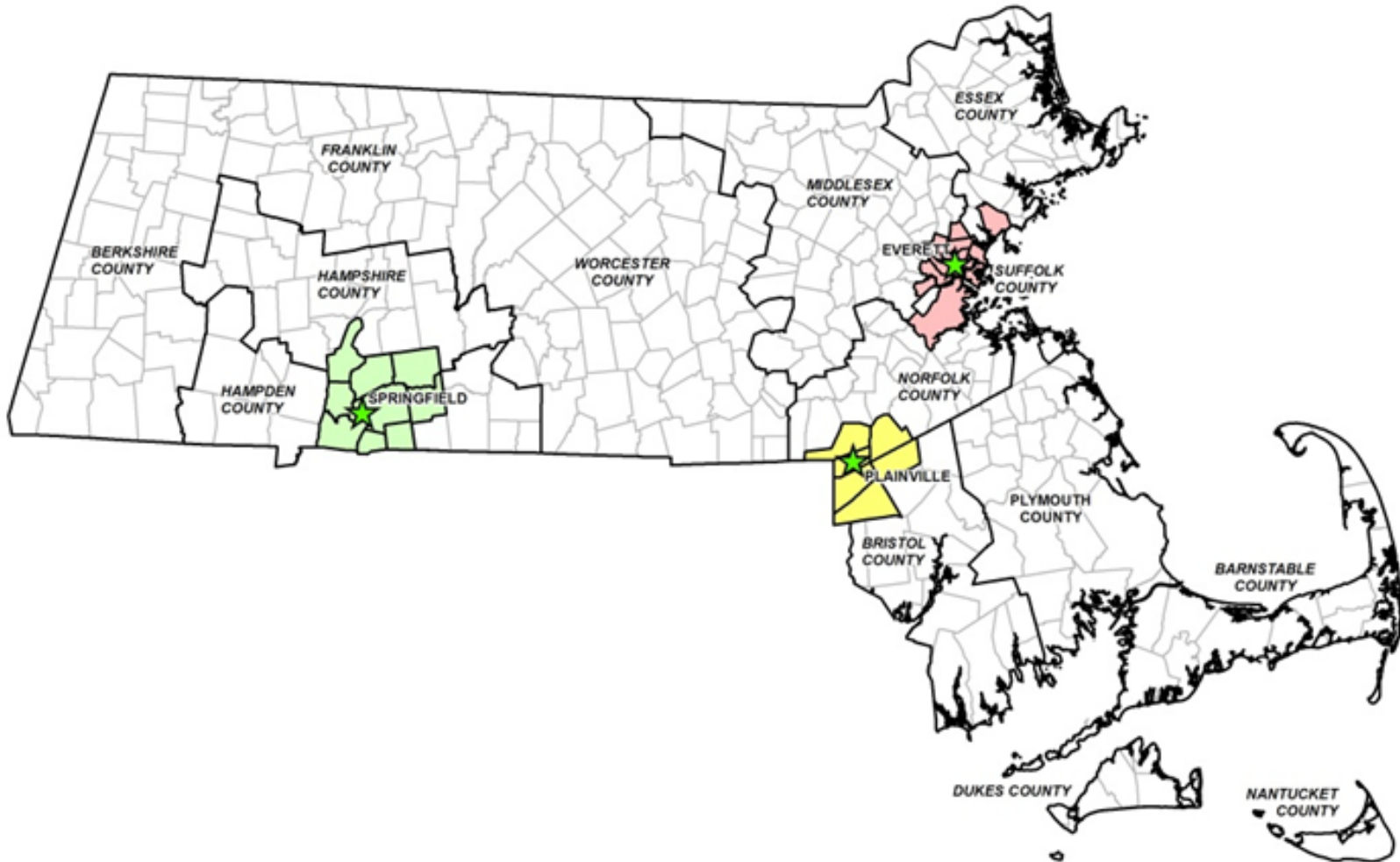
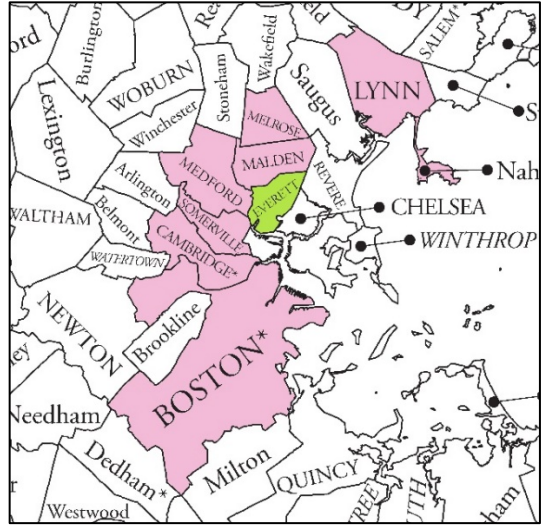
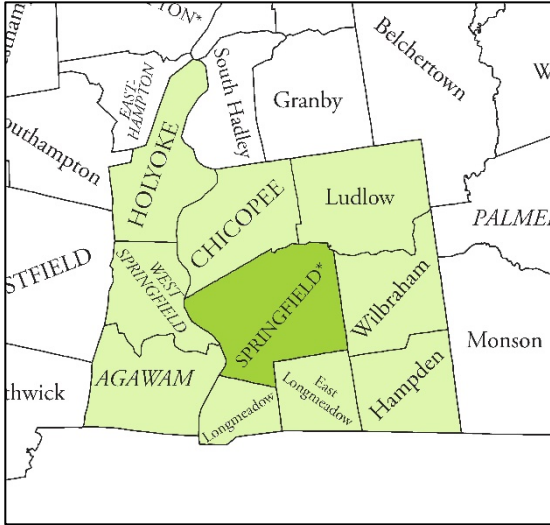
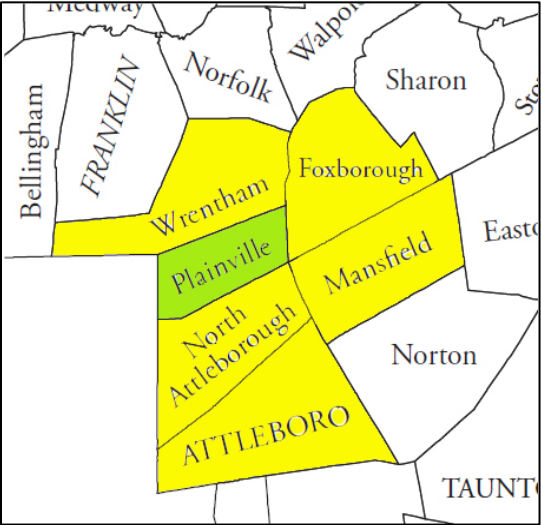


Figure 3. The Three Host and Surrounding Communities for the Three Casinos



THEORETICAL FRAMEWORK FOR CONDUCTING SOCIOECONOMIC IMPACT ANALYSES OF GAMBLING

The specific theoretical approach used to study the effects of gambling is a fundamentally important determinant of the results obtained, as well as the validity of these results. Historically, there has been considerable controversy about the appropriate theoretical and methodological approach to studying gambling impacts. These issues have been the focus of conferences ('Whistler Symposium' in British Columbia in 1999 (Wynne & Shaffer, 2003), the 'Social and Economic Costs and Benefits of Gambling' conference in Banff, Alberta in 2006); special issues of the *Journal of Gambling Studies* (June 2003) and *Managerial and Decision Economics Journal* (June 2004); books (Grinols, 2004; Hsu, 2014; Walker, 2007, 2013; Williams & Siegal, 2013); comprehensive reviews (Williams, Rehm, & Stevens, 2011); and many individual articles and reports (Anielski & Braatan, 2008; Australian Productivity Commission, 1999; Centre for Social & Health Outcomes Research & Evaluation, 2008; Collins & Lapsley, 2003; Committee on the Social and Economic Impact of Pathological Gambling, 1999; Eadington, 1998; Eadington, 2003; Gazel, 1998; Gerstein, Volberg, Harwood, & Christiansen, 2004; Grinols, 2007; Grinols & Mustard, 2001; Grinols & Omorov, 1996; Hawke, 2000; Hayward & Colman, 2004; Henriksson, 2001; Kelly, 2004; Kindt, 1994; Marfels, 1998; Nichols & Tosun, 2013; Nichols, Stitt, & Giacomassi, 2000; Nichols, Tosun, & Yang, 2015; O'Neil, Chandler, & SA Centre for Economic Studies, 2009; Persky, 1995; Single, 2003; Stevens & Williams, 2004; Thompson, Gazel, & Rickman, 1997; Victorian Gambling Research Panel, 2001; Walker, 2003, 2008a, 2008c; Walker & Sobel, 2016; Williams, 2011; Wu & Chen, 2015).

Despite all of this work there is still no universally agreed-upon approach for assessing the socioeconomic impacts of gambling. There remain several contentious issues, with one of the central ones being how to capture and quantify the social impacts (Collins & Lapsley, 2003; Eadington, 2003; Walker, 2003a, 2008a, 2008c; Williams, Rehm & Stevens, 2011). Some impact studies of gambling have simply ignored social impacts, choosing to only measure the most apparent and obvious economic benefits that are more easily quantifiable (e.g., gambling revenue, tax revenue, employment numbers). Examples include Anderson's (1997) study of U.S. casino gambling; Littlepage et al.'s (2004) study of riverboat gambling in Indiana and the Canadian Gaming Association's analysis of the impacts of gambling in Canada (HLT Advisory, 2008). However, this creates an unbalanced analysis in that the positive economic impacts are not evaluated in the context of the negative social impacts. By way of example, it would be inappropriate if socioeconomic analyses of the effects of alcohol or tobacco just focused on the tax revenues, employment gains, and support to the agricultural sector, and failed to mention the negative social impacts caused by consumption. However, failing to measure social impacts is not an infrequent occurrence in the socioeconomic analysis of gambling.

Better quality socioeconomic impact studies have cast a wider net and included important social impacts such as problem gambling and crime. For example, Anielski & Braatan (2008) proposed a framework for analyzing the social and economic impacts of gambling that assesses gambling's impact in six areas: Health and Well-Being; Economic and Financial; Employment and Education; Recreation and Tourism; Legal and Justice; and Culture. Within each of these areas there are specific costs and benefits of gambling that need to be addressed (a total of 34 variables/indicators).

The more problematic issue has been how to directly compare the social impacts with the financial/economic ones so that an overall determination of the positive or negative nature of gambling can be made. Some studies have attempted to do this by estimating the monetary value of these social impacts so that they can be combined with the monetary/economic impacts in other areas. This is the cost-benefit analysis (CBA) approach to gambling that is best illustrated by the work of the economist Earl Grinols (2004).

However, while determining the financial costs of some social impacts is reasonably straightforward (e.g., costs of treating problem gamblers, or the costs of prosecuting and incarcerating gambling-related crime), estimating costs for many other social impacts is not. This includes the costs of suicides, divorces, loss of social capital,³ the leisure benefit of gambling, as well as the psychic trauma of being a problem gambler. The alternative is to try to establish an approximate financial cost. Examples include asking people “how much would you pay not to be a problem gambler”; or tabulating the direct and indirect financial ramifications of gambling-related suicides (funeral costs, lost productivity, etc.); or trying to financially quantify the leisure benefit of gambling by calculating ‘consumer surplus’ (i.e., difference between what people would be willing to pay for gambling versus what they actually pay). Unfortunately, the figures obtained from this approach depend on a large and somewhat arbitrary set of assumptions, and thus are fairly unreliable, producing widely different estimates. It also remains unclear how to create a monetary value for some variables (e.g., loss of social capital). Even the strongest supporters of this full-cost-benefit approach acknowledge these serious difficulties. For example, Anielski & Wynne (2009) ended up abandoning this strategy in their socioeconomic impact study of gambling in Nova Scotia.

Aside from these practical issues, an argument can be made from a theoretical standpoint that it is inappropriate to apply an arbitrary monetary amount to something that is clearly nonmonetary in its value or consequences to the participant. Furthermore, doing so simply reinforces the erroneous notion that money is the most appropriate and important metric upon which to judge the impact and/or the overall value of gambling.

This latter issue is not restricted to gambling. Widespread dissatisfaction with reliance on financial measures such as [gross domestic product](#) (GDP)⁴ or CBA to measure societal progress or impacts on overall societal well-being has existed for many years (e.g., Atkinson, 2000; Daly & Cobb, 1989; Dasgupta & Mäler, 2000; Tinbergen & Hueting, 1992). This situation has directly led to the development of several alternative measures to assess progress/impacts in a more comprehensive fashion. These measures include the United Nations [Human Development Index](#), the [Quality of Life Index](#), [Full Cost Accounting](#), the [Happy Planet Index](#) the [Canadian Index of Wellbeing](#), the [Index of Sustainable Economic Welfare](#), the [Green National Product](#) and the [Genuine Progress Indicator](#) (GPI). Most of these measures recognize economic productivity (e.g., GDP) as an important aspect to be considered, but they do not make it the central basis upon which a judgement about progress or societal well-being is made.

Unfortunately, while these approaches are more theoretically satisfying, they have practical problems of their own. First, although they all have similar goals, their specifics are markedly different from each other. This illustrates the fact that determining which indicators contribute to societal well-being is a very value-laden task

³ Roughly defined as the degree of societal interconnectedness and shared interest.

⁴ GDP is defined as the dollar value of all goods and services produced in a jurisdiction over a one-year time period (primarily measured by the aggregate volume of monetary transactions/sales that occur). This measure has been critiqued because although it provides a rough measure of the magnitude of economic activity, it does not measure whether this economic activity is sustainable, efficient, or conducive to societal well-being.

that is not well agreed upon. Second, most of these approaches have the same problem as cost-benefit analysis in that they aspire to combine impacts into a single index, usually just by adding up the number of beneficial indicators against the detrimental ones. This is problematic because it makes all impacts equivalent in value and/or requires a subjective judgement about the relative value/weight of one impact against the others.

Unfortunately, the reality is that there is no reliable way of combining social impacts with monetary impacts to produce a single summative measure. *Instead, assessing the overall positive or negative nature of an enterprise that has wide ranging social and economic impacts (such as gambling) will always be a subjective judgement about the relative importance of the observed social impacts compared to the observed economic impacts.*

However, this fact does not preclude conducting meaningful socioeconomic analyses of gambling. Rather, there are many basic **principles for conducting socioeconomic impact studies** that can ensure that the obtained results are comprehensive, balanced, and scientifically rigorous. The purpose of the next section of this paper is to outline these principles. These principles are very much in the spirit of the Anielski & Braatan (2008) framework as they ensure there is a meaningful accounting of the social impacts of gambling. At the same time, they address the critiques of this framework (e.g., Walker, 2008d), and of socioeconomic research more generally, by a) proposing a simpler and more user-friendly categorization of impacts, b) providing a clearer description of how these impacts are to be evaluated and combined, c) enshrining basic principles of economic gain/value in the evaluation (Walker 2003, 2008a, 2008d; Walker & Barnett, 1999), and d) outlining scientifically rigorous strategies to better ensure things such as attributional fractions⁵ and causal direction of the impacts can be better established.

⁵ In the present context 'attributable fraction' concerns how to appropriately proportion costs attributable to gambling, when many problem gamblers have comorbid disorders (e.g., substance abuse, mental health problems) that contribute to the negative consequences which problem gamblers experience such as suicide, divorce, and crime (Australia Productivity Commission, 1999; Walker, 2008d).

PRINCIPLES FOR CONDUCTING SOCIOECONOMIC IMPACTS ANALYSES OF GAMBLING

Much of the following is adapted from Williams, Rehm & Stevens (2011).

Measure 'Impacts' rather than 'Costs and Benefits'

While many gambling impacts are clearly negative (e.g., increased problem gambling) or positive (e.g., employment gains), the positive or negative nature of several other changes is less clear and somewhat subjective (e.g., changed societal pattern of leisure pursuits, cannibalization of competing industries, increase in tax revenue). 'Impact' is often a better term than 'costs and benefits' as it conveys the fact that a change has occurred without having to necessarily characterize it as positive or negative. Use of this term also avoids confusion with the CBA use of the terms 'cost' and 'benefit'.

Avoid Applying Arbitrary Monetary Values to Impacts that are clearly Non-Monetary in Nature.

As mentioned earlier, it is a mistake not to capture social impacts that do not have significant monetary consequences. However, it is also a problematic to try to capture them within a cost-benefit economic framework by applying an arbitrary monetary value to them. This approach fails to recognize that the true nature of the impact is largely non-monetary/economic in nature.

In most cases, social impacts are best quantified and reported *simply by means of percentage change in the variable and/or the actual number of people impacted (e.g., % change in rate of problem gambling, % change in crime, change in pattern of leisure behavior, etc.)*.

Create a Profile of the Economic and Social Impacts Rather than Trying to Combine them into a Singular Aggregate Value.

The advantage of a common metric (e.g., money) is that it potentially allows for the combination of all impacts into an overall aggregate value. However, as mentioned, this approach can be problematic because of a) difficulties applying monetary values to many social impacts, b) the need to construe everything as either a cost or benefit, c) the inappropriateness of using money as a way of characterizing the nature and magnitude of some social impacts (e.g., suicide).

In most cases the best way of treating these impacts is to simply list them and to create a profile of impacts. For most social impacts, reporting the percentage change in the variable and/or the percentage of people impacted is most descriptive. For many of the economic impacts a monetary value can be used to quantify the magnitude of the effect within each impact area. There can also be value in aggregating the monetary amounts within and/or across economic impact areas.

Apply Basic Economic Principles to Evaluate the Positive or Negative Nature of the Economic Impacts

One of the critiques of many socioeconomic approaches to gambling is that they fail to adequately consider important economic principles in judging the overall impacts (Walker 2003, 2008a, 2008d; Walker & Barnett, 1999). For example, several costs of gambling in the Anieski & Braatan (2008) framework (e.g., theft, unemployment, costs of treating problem gamblers) are unlikely to result in any real reduction in the economic wealth within a society/jurisdiction (i.e., these are simply transfers of wealth within society) (Eadington, 2003; Walker, 2003, 2008a; Walker & Barnett, 1999). There is no doubt that theft and treatment for problem gamblers are important negative impacts that need to be identified and documented. However, the point is that these types of impacts have relatively little influence on the overall economic vitality/wealth of a jurisdiction.

Rather, for something to have a meaningful economic/monetary impact one of the following needs to be present:

- *The economic activity causes either an influx of money/assets from outside the jurisdiction or a loss of money/assets to an outside jurisdiction.* For gambling, an influx occurs when the primary patronage base is from outside the jurisdiction, or capital investments are made in the community by outside agencies (e.g., casino developer, private businesses, government).
- *The economic activity increases or decreases the value of existing assets.* This impact generally does not apply to gambling, or to entertainment industries more generally, as gambling primarily involves a transfer of wealth rather than a creation of wealth.⁶ However, it can occur when the introduction of a new gambling venue either increases or decreases the market value of neighboring property. It can also occur in the manufacture of gambling equipment (e.g., electronic gambling machines) that can be sold for an amount worth more than the sum of the parts.
- *The economic activity produces increased or decreased utilization of existing money.* Money that sits dormant has very little economic utility to the broader economy. It has much greater utility if it is spent on gambling, this gambling revenue is then spent on employee wages, and these wages are then used to buy local goods and services. In general, money has increased economic value as a function of the number of people that use the money and the speed of the cash flow from one person to the next (Walker, 1999, 2007). Increased utilization of existing money is more likely to occur if gambling patronage comes from individuals who are not financing their gambling by reducing their spending on other activities (i.e., the income class of the patronage potentially speaks to this). Evidence of increased utilization of existing money is seen if the increased revenues and employment in the gambling industry (and supporting/complementary industries) occurs without there being offsetting declines in the revenues and employment in other industries. There is good evidence that adding a new and interesting service/good to the economy (e.g., gambling) can at least temporarily create increased monetary flow without negative impacts on other businesses (Walker & Jackson, 1998; 2007).
- *The transfer of wealth and shifts in monetary flow related to the new economic activity strengthens or weakens sectors of the economy capable of producing an influx/outflow of wealth, increased/decreased*

⁶ Wealth creation is more typical of manufacturing industries. For example, a car manufacturing industry creates wealth by making things that are worth more than the sum of their constituent parts. Most entertainment industries, in contrast, simply redirect monetary flow from one sector of the economy to another.

value of existing assets, or increased/decreased utilization of money. One of the potential concerns with gambling is that it may redirect money from wealth-producing sectors (i.e., private business) to sectors not known for wealth creation (i.e., government, charity).

- *The failure to implement the economic activity would have resulted in an influx/outflow of wealth, increased/decreased value of existing assets, or increased/decreased utilization of money.* Even if there is not a clear economic gain, an economic benefit still exists if the gambling activity prevented assets or money from leaving the jurisdiction, prevented a decrease in the value of existing assets, or prevented decreased utilization of existing money.

Identify How Much Money is Involved, Where it is Coming From, and Where it is Going

The principles listed up to this point have been focused primarily on resolving the central methodological issue of how to handle the social impacts of gambling. The following principles are focused on some of the practical issues involved in conducting socioeconomic analyses of gambling and ensuring optimal scientific rigor.

As mentioned, gambling is an economic activity characterized by a transfer of wealth. There are groups and sectors that are winners and there are groups and sectors that are losers, and *most of the impacts are seen in these groups/sectors*. Thus, the first step in a socioeconomic analysis of gambling is to document a) how much money is being transferred (a rough gauge of the magnitude of the potential impacts); b) where the money is coming from; and c) where the money is going. The demographic characteristics of the gamblers are particularly important, with the most important socioeconomic variables being age, gender, race/ethnicity, income, and problem gambling status. The geographic origin of the gamblers is also very important because it speaks to a) whether the revenue is an infusion of new wealth or just local money that has been redirected, and b) the geographic range in which to expect (and therefore, measure) impacts.

Next, it is important to clearly document which groups/sectors are the primary recipients of gambling revenue (i.e., private operator, different levels of government, charity, local community) as well as the geographic location of each of these groups. It is also essential to document how these groups then disburse or spend the money to identify all the downstream beneficiaries. The geographic origin of the operating expenses to run the new type of gambling, as well as the origin of any equipment purchased are also relevant to a socioeconomic accounting. (Note: if gambling revenues are primarily collected at the state or federal level, rather than at the municipal level, and are redistributed statewide or federally, then there is a good chance that there will be a net outflow of money from the local municipality hosting the gambling venue).⁷

Establish both the Micro and Macro Geographic Impacts

Most socioeconomic impact studies have only focused on the changes in the community that received the new form of gambling. However, for a full understanding of the impacts, it is necessary to go beyond these boundaries, as financial inflow/benefits in one region usually come at the expense of financial outflow or loss of benefits in adjoining regions. Thus, one should aspire to assess both the micro (community specific) impacts and the macro (greater regional) impacts. As mentioned, the geographic origin of the patronage is a good indication

⁷ Some jurisdictions compensate for this by providing municipalities with a guaranteed fixed percentage of the profits, but often this does not fully compensate for the outflow.

of the regional scope of the impacts. Once the boundary of this larger region/jurisdiction is established, it is important to clearly identify the impacts within the community of interest as well as regionally.

Assess Impacts for Years before and for Years after the Introduction of New Gambling Venues/Opportunities

The length of time it takes for all of the economic and social impacts of gambling to manifest themselves is unclear. Some of the economic impacts (e.g., revenues, employment, etc.) tend to be immediate. On the other hand, it may take a few years for competing industries to fail or for increased utilization of roads, sewers, etc. to result in the need for repairs. Some economic impacts will also reverse themselves in a resilient economy as industry repositions itself. Social impacts may take longer to appear than economic impacts. While some individuals experience rapid onset of gambling problems, others gamble safely for several years before problems develop (Committee on the Social and Economic Impact of Pathological Gambling, 1999). There is also good evidence that rates of gambling and problem gambling may decline with extended exposure (LaPlante & Shaffer, 2007; Shaffer, LaBrie & LaPlante, 2004). It is also very important to realize that new gambling opportunities are always added to existing gambling opportunities (even if they are illegal). Thus, lag effects of these pre-existing opportunities can easily be mistaken for immediate impacts of the new forms. In order to isolate such effects, it is important to document prior gambling opportunities and socioeconomic effects for several years before as well as for several years after the introduction of a new form of gambling.

Use Longitudinal/Cohort Designs when Possible

Most impact studies collect yearly statistical ‘snapshots’ of a community’s socioeconomic indicators. Attempts are then made to attribute any changes to the introduction of the new gambling activity (e.g., an increase in problem gambling after one year being responsible for a corresponding bankruptcy rate increase after one year). However, two data points provide no information concerning whether problem gambling caused the bankruptcies, the bankruptcies caused the problem gambling, or whether they were independent events. Even if one event precedes the other (e.g., problem gambling increase in year 1 followed by bankruptcy increase in year 2), causal attributions are weak unless it can be established that increased bankruptcies occurred primarily among the problem gamblers.

A related problem with cross-sectional designs is that there is no way of knowing the exact meaning of a stable prevalence rate from Time 1 to Time 2. Longitudinal research has documented that the modal duration of problem gambling is only one year (Williams, Hann et al., 2015). Stable prevalence rates can either mean that the same people continue to be problem gamblers at Time 2 or, alternatively, that there is a similar number of people remitting from problem gambling as there are new problem gamblers. The ability to make causal attributions within individuals and establish problem gambling *incidence* (i.e., the rate of new cases) requires longitudinal/cohort designs that document the temporal sequence of events in ‘real time’ within individuals.

Comprehensively Assess all Potential Economic and Social Impacts

It is self-evident that all impacts of gambling must be included in an impact analysis. There is a multitude of different and equally legitimate ways of organizing and categorizing these impact areas. It is also difficult to clearly separate social from economic impacts, as virtually all ‘social’ impacts also have some economic consequences and most ‘economic’ impacts have some social consequences. Thus, the important thing is not the overall organization but ensuring that a) all of the potential impact areas are covered, and b)

economic/monetary impacts are given equal prominence to the social/nonmonetary impacts. The following is the organization of the impact areas employed in the present analysis.

Table 5. Social and Economic Framework in SEIGMA

SOCIAL and HEALTH IMPACTS (i.e., impacts that are primarily non-monetary)	
Problem Gambling and Related Indices	Prevalence and Incidence of Problem Gambling
	Treatment Seeking for Problem Gambling
	Financial Problems, Bankruptcy, Employment Problems
	Divorce, Separation, Domestic Violence, Child Abuse and Neglect
	Suicide
Crime	Overall Crime Rates
	Illegal Gambling
Attitudes	Attitudes (towards gambling)
Population Health & Leisure	Physical and Psychological Health
	Substance Use and Addictions
	Leisure Activity (% of people who gamble; rated importance as leisure activity)
Demographics	Population
	Educational System
Environment	Traffic (accidents, volume)
	Noise
ECONOMIC and FISCAL IMPACTS (i.e., impacts that are primarily monetary)	
Direct Casino Expenditure and Revenue	Plainridge Park Casino
	MGM Springfield
	Encore Boston Harbor
Business Establishments	Number of Business Establishments
	Impacts on Other Industry Sectors
	Impacts on Other Types of Gambling
Employment	Employment Levels, Labor Force Participation, Unemployment
Personal Income	Wages
	Poverty Rate
	Gambling Participation in Relation to Income
Real Estate and Housing	Property Values
	Residential Building Permits
	Rental Costs
Government and Fiscal	Expenditure
	Revenue

Employ Methodologies that Facilitate Causal Attribution

It is often difficult to unambiguously attribute observed socioeconomic changes to the introduction of gambling as there are many other socioeconomic forces at work in society and in the economy that may be partially or fully responsible. The absence of change in a certain social or economic variable provides reasonable evidence there has been no impact on that variable at the specific geographic level measured. However, when there is a change in a variable in the expected direction that is temporally associated with the introduction of a new type of gambling often all that can be said is that the change is *consistent* with a potential impact.⁸

Socioeconomic impact studies need to use methodologies that strengthen this causal attribution. The likelihood that an observed change is actually attributable to gambling becomes stronger when: a) many variables are assessed such that there is an ability to point to analogous changes in several variables theoretically related to gambling and the absence of change in variables not theoretically related to gambling; b) other sources of information pertaining to the same variable are collected and make more direct attributions (e.g., gamblers in population surveys directly attributing their separation or bankruptcy to the new type of gambling; key informants in the local community also making these direct attributions); and c) other socioeconomic influences are controlled for, as in a ‘matched community comparison’ analysis.

A matched community comparison involves examining changes in the region or municipality receiving the new form of gambling compared to changes in an economically, socially, and demographically similar region or municipality that did not receive the new form of gambling. This approach is not without problems, however, as there may be baseline attitudinal differences in regions that opt to have the new form of gambling versus communities that have opted not to have it. Also, the control region must be far enough away so as not to be secondarily impacted by the introduction of the new form of gambling, and sufficiently stable to serve as a control. This geographic separation makes it more difficult to find a region that is a good match. Other issues concern the fact that many some variables of interest (e.g., prevalence of problem gambling) may not be available at a municipal or regional level. APPENDIX A: Matched Communities Comparison specifies how the Matched Community Comparison is being operationalized in SEIGMA.

Speculate on What the Situation Would have been Without the Introduction of the New Form of Gambling

Most studies compare economic and social indicators after the introduction of gambling to what these indicators were before the introduction of gambling. However, the justification for the introduction of a new form of gambling is often the desire to stem the outflow of gambling dollars to neighboring jurisdictions that already offer this new form of gambling. Thus, an even more relevant comparison than ‘baseline’, is what the likely economic and social situation would have been if gambling had not been introduced (i.e., the ‘counterfactual situation’) (Walker, 2008c). The extent to which the introduction of domestic gambling opportunities has prevented losses to neighboring jurisdictions is very difficult to judge and highly speculative, but nonetheless merits consideration.

⁸ In a similar way, many of the adverse effects of problem gambling cannot be uniquely attributed to the introduction of a new gambling venue or type of gambling, as most problem gamblers engage in a wide variety of gambling activities and also have comorbid conditions that contribute to their problems (e.g., substance abuse, mental health problems) (Australia Productivity Commission, 1999; Lorains, Cowlishaw & Thomas, 2011; Walker, 2008d). The conditions having the highest comorbidity to problem and pathological gambling are: nicotine dependence (60.1%), substance use disorder (57.5%), mood disorders (37.9%), and anxiety disorders (37.4%) (Lorains et al., 2011).

Recognize that Assessing the Overall Positive or Negative Nature of the Observed Impacts is a Qualitative Assessment that Often Involves Some Subjectivity

The judgment about whether the overall impacts of gambling are positive or negative (and the degree to which they are positive or negative), requires a joint qualitative assessment of a) the profile of social impacts, and b) the judged overall positive or negative economic value of the economic impacts. When these things are aligned, then this assessment is straightforward (i.e., mostly positive social impacts and positive economic value; mostly negative social impacts and negative/no economic value).

However, the assessment is inherently subjective when these things are not in alignment (e.g., net economic gains but mostly negative social impacts). In this situation, the overall assessment will depend on the importance one assigns to the economic versus social impacts. In particular, the overall assessment will depend on whether one believes that the net economic value of the activity adequately offsets any negative social impacts.⁹

One potential way of reducing the individual subjectivity of this determination is simply to present the results and let the reader decide whether he/she considers the positives to outweigh the negatives. Another solution is to present the profile of results to a representative group of individuals from the jurisdiction and seek their opinion about whether they judge the overall impacts to be positive or negative.

Report the Limitations and Parameters of these Results

The final principle is to clearly recognize and report that the results obtained are very much a function of the context in which the study was conducted. More specifically:

- *Impacts are Dependent on the Magnitude of the Change in Gambling that has occurred for the Population.* Adding a large casino to a small community without prior gambling opportunities will usually have a much larger impact than adding a new casino to a large city that already has existing casinos and/or other gambling opportunities.
- *Impacts are Somewhat Specific to the Type of Gambling Studied.* Different types of gambling have different profiles of impacts in terms of their potential for contributing to problem gambling (e.g., EGMs vs. lotteries), the number of jobs they produce (horse racing vs. EGMs), and their likelihood of cannibalization of other industries, etc. Hence, it is necessary to qualify results as being specific to the type of gambling studied.
- *Impacts are Somewhat Specific to the Jurisdiction Studied.* Jurisdictions differ widely in how gambling revenue is distributed, pre-existing availability of gambling, the strength of policy and educational initiatives to prevent problem gambling, baseline levels of poverty and unemployment, and the vulnerability of the population to addiction. Hence, it is important to recognize that the results will be somewhat dependent on the conditions that exist in the particular jurisdiction being studied.

⁹ Other areas of subjectivity also exist; for example, how some of the ambiguous impact categories are construed (e.g., is increased government revenue a positive or negative thing). Another example concerns whether you consider the micro (community-level) impacts more important than the macro (regional-level) impacts.

- *Impacts are Somewhat Specific to the Time Period Studied.* The time period during which impacts are studied is critical, as gambling availability and gambling policy can change rapidly within a jurisdiction. Furthermore, there is evidence that populations with extended exposure to gambling may have different rates of problems compared to places with more recent introduction of gambling (LaPlante & Shaffer, 2007; Shaffer et al. 2004).

DATA SOURCES

The following is a brief description of some of the main data sources utilized in the present report. In most cases the results presented in the present report have been extracted from these original reports, but there are some cases where additional analyses of the data have been undertaken. In addition to these primary reports, data presented in the present report has also been taken from many secondary sources (all of which are reported).

Gambling and Problem Gambling in Massachusetts: Results of a Baseline General Population Survey (BGPS)

This report summarizes findings from the Baseline General Population Survey (BGPS) of Massachusetts, which was employed to assess gambling behavior and problem gambling before any of the state's new casinos became operational. The BGPS was an address-based multi-mode survey conducted between September 11, 2013 and May 31, 2014 with adult (18+) Massachusetts residents. A total of 9,578 randomly selected Massachusetts adults (18+) completed the questionnaire. This report presents findings on: attitudes toward gambling in Massachusetts; gambling behavior in Massachusetts; prevalence of problem gambling in Massachusetts; comparisons between recreational, at-risk, and problem gamblers in Massachusetts; and attitudes toward, awareness of, and involvement in problem gambling services in Massachusetts.

Volberg, R.A., Williams, R.J., Stanek, E.J., Houpt, K.A., Zorn, M., & Rodriguez-Monguio, R. (2017). *Gambling and Problem Gambling in Massachusetts: Results of a Baseline Population Survey*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst. September 15.

http://www.umass.edu/seigma/sites/default/files/Updated%20BGPS%20Report_Final.pdf

White Paper: Key Findings from SEIGMA Research Activities & Potential Implications for Strategic Planners of Problem Gambling Prevention and Treatment Services in Massachusetts

This paper provides a summary of descriptive statistics from the BGPS, a descriptive analysis of data from the Massachusetts problem gambling helpline, and key findings from an online focus group of mental health and substance abuse treatment providers across the state. The report details the potential implications that these findings have for planners of problem gambling prevention and treatment services in Massachusetts.

Houpt, A.K., Volberg, R.A., Williams, R.J., Stanek, E.J., & Zorn, M. (2015). *White Paper: Key Findings from SEIGMA Research Activities & Potential Implications for Strategic Planners of Problem Gambling Prevention and Treatment Services in Massachusetts*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst. December 18.

http://www.umass.edu/seigma/sites/default/files/White%20Paper%201_1-4-2016_Final_0.pdf

Targeted Population Surveys

In addition to the statewide general population survey, ‘Targeted Population Surveys’ have been conducted in the geographic areas where new casinos and the slot parlor have been built or are currently being built. These targeted areas include the ‘host’ community where the casino will be located as well as the ‘surrounding communities’ which are defined as municipalities proximate to a host community and which the Massachusetts Gaming Commission deems likely to experience impacts from the new venue (see Figure 3). There are both ‘Baseline Targeted Population Surveys’ (before the casino has opened) and ‘Follow-Up Targeted Population Surveys’ (after the casino has been opened for one year). The same methodology utilized in the Baseline General Population Survey (BGPS) was employed in these Targeted Surveys. The details of the surveys that have been conducted and/or are scheduled are contained in Table 6.

Table 6. Targeted Population Surveys in SEIGMA

Geographic Area	Baseline Targeted Survey	Casino/Slot Parlor	Follow-Up Targeted Survey
Plainridge Park Casino H&SC <ul style="list-style-type: none"> Plainville (host), Attleborough, Foxborough, Mansfield, North Attleborough, Wrentham 	<ul style="list-style-type: none"> Baseline Targeted Population Survey – Plainville (BTPS-Plainville) May – Jul 2014 N = 1,093; 28.2% response rate 	<ul style="list-style-type: none"> Plainridge Park Casino Opened June 24, 2015 	<ul style="list-style-type: none"> Follow-Up Targeted Population Survey – Plainville (FTPS-Plainville) Oct 2016 – Feb 2017 N = 1,012; 27.7% response rate
MGM Springfield H&SC <ul style="list-style-type: none"> Springfield (host), Agawam, Chicopee, East Longmeadow, Holyoke, Longmeadow, Ludlow, Wilbraham, West Springfield 	<ul style="list-style-type: none"> Baseline Targeted Population Survey – Springfield (BTPS-Springfield) ¹⁰ Feb – Jul 2015 N = 1,131; 31.7% response rate 	<ul style="list-style-type: none"> MGM Springfield Open August 24, 2018 	<ul style="list-style-type: none"> Follow-Up Targeted Population Survey – Springfield (FTPS-Springfield) (a subsample of the Follow-Up General Population Survey) Jul 2020 – Mar 2021 (tentative) N ~1,000
Encore Boston H&SC <ul style="list-style-type: none"> Everett (host), Boston, Cambridge, Chelsea, Lynn, Malden, Medford, Revere, Somerville 	<ul style="list-style-type: none"> Baseline Targeted Population Survey – Everett (BGPS-Everett) (a subsample of the Baseline General Population Survey) Sep 2013 – May 2014 N = 1,155; 36.6% response rate 	<ul style="list-style-type: none"> Encore Boston Harbor Scheduled to open June 2019 	<ul style="list-style-type: none"> Follow-Up Targeted Population Survey – Everett (FTPS-Everett) (a subsample of the Follow-Up General Population Survey) Jul 2020 – Mar 2021 (tentative) N ~1,000

¹⁰ The BGPS also contains 1,197 people from the MGM Springfield H&SC that could potentially serve as a second Baseline for this area.

Baseline Online Panel Survey (BOPS)

A Baseline Online Panel Survey (BOPS) of 5,046 Massachusetts adults (18+) took place between October 2013 and March 2014. The main purpose of the BOPS was to recruit a larger sample of problem gamblers to obtain more reliable estimates of their behaviors, as online panels contain a significantly higher prevalence rate of various pathologies, including problem gambling. This report summarizes the results of this enriched sample and reports findings on the negative personal impacts of gambling, the differential impact of different types of gambling, and prevention awareness and treatment-seeking behavior of problem gamblers in Massachusetts. This information is useful to help establish baseline levels of impacts prior to the introduction of casino gambling to Massachusetts as well as for purposes of treatment planning.

Williams, R.J., Pekow, P.S., Volberg, R.A., Stanek, E.J., Zorn, M., & Houpt, K.A. (2017). *Impacts of Gambling in Massachusetts: Results of a Baseline Online Panel Survey (BOPS)*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst. January 10.

http://www.umass.edu/seigma/sites/default/files/Baseline%20Online%20Panel%20Report_2017-01-10.pdf

Massachusetts Gambling Impact Cohort (MAGIC)

In 2015, the first large scale longitudinal cohort study of gambling and problem gambling in the U.S. was launched in Massachusetts. The cohort was established from a stratified sample of 3,139 respondents who completed the SEIGMA Baseline General Population Survey (BGPS). The main purpose of the stratified sample was to ensure that the cohort included the largest possible number of individuals who might be expected to change their gambling status over the course of the study, including Problem Gamblers, At-Risk Gamblers, and individuals who gambled regularly or spent substantial amounts on gambling. (All participants in the BGPS who were either problem gamblers, at-risk gamblers, spent \$1200+ annually on gambling, gambled weekly, or had military service after 2001 were approached to be part of the cohort. A total of 33% of all other BGPS participants were also approached). For this Impact Report, we utilize data from Wave 1 (2013), Wave 2 (2015), and Wave 3 (2016) of the cohort study. Additional waves of data are being collected from the cohort in 2018, 2019, and 2020. The assessment dates, assessment window (length of time the survey was open), inter-assessment interval (average time from start of one assessment to start of the next assessment for all participants), and sample sizes of the MAGIC cohort for each wave are contained in Table 7.

Table 7. Details of Different Waves of MAGIC

MAGIC	Date	Assessment Window	Average Time Since Previous Assessment	Eligible Sample	Completed Surveys
Wave 1	Sep 11, 2013 – May 31, 2014	8.5 months			3096
Wave 2	Mar 17, 2015 – Sep 11, 2015	6 months	16.5 months	4860	3139 ^b
Wave 3	Mar 31, 2016 – Aug 15, 2016	4.5 months	12.5 months	3139	2450
Wave 4	Apr 6, 2018 – Jul 24, 2018	3.5 months		3046 ^a	2061
Wave 5	Mar 2019 – Jul 2019				
Wave 6	Mar 2020 – Jul 2020				

a=eligibility reduced due to deaths and medical incapacitation; b=94.7% had completed the survey prior to PPC opening

Volberg, R.A., Williams, R.J., Stanek, E.J., Zorn, M., & Mazar, A. (2017). *Analysis of MAGIC Wave 2: Incidence and Transitions*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst, December 22.

http://www.umass.edu/seigma/sites/default/files/MAGIC%20Wave%202%20Report_FINAL.pdf

Center for Health Information and Analysis (CHIA) Data

A recent article was published in the *Journal of Addiction Medicine* on the healthcare costs of pathological gambling (PG) and co-occurring mental health and substance use disorders. Data were derived from the Massachusetts All-Payer Claims Data—a representative health claims database—for the period 2009 to 2013. The data contained all medical and pharmaceutical claims for commercially insured Massachusetts residents who were aged ≥18 years, had health insurance coverage, had a primary diagnosis of pathological gambling, and sought care in Massachusetts. Healthcare cost components included outpatient, inpatient, emergency room visits, and prescription drugs.

Rodriguez-Monguio, R., Brand, E., & Volberg, R.A. (2018). The Economic Burden of Pathological Gambling and Co-Occurring Mental Health and Substance Use Disorders. *Journal of Addiction Medicine* 12(1): 53-60.

<https://www.ncbi.nlm.nih.gov/pubmed/29068825>

Assessing the Impact of Gambling on Public Safety in Massachusetts Cities and Towns

The primary purpose of these annual reports produced by Christopher Bruce—consultant to the MGC—is to analyze the changes in crime in the communities surrounding Plainridge Park Casino since its opening and to identify which changes might be attributable to the casino. The data contained in these reports is derived from: a) Gaming Enforcement Unit records (a division of the Massachusetts State Police); b) local police records (crimes and non-crime calls for service were included) for the communities of Plainville, Attleboro, Foxborough, Mansfield, North Attleborough, and Wrentham since 2010; and c) reviews of police narratives and discussions with officers and analysts at the different police departments.

Bruce, C.W. (2016). *Assessing the Impact of Gambling on Public Safety in Massachusetts Cities and Towns: Analysis of Changes in Police Data after the First Year of Operation at Plainridge Park Casino*. December 12.

<http://massgaming.com/wp-content/uploads/Assessing-the-Impact-of-Gambling-on-Public-Safety-in-Massachusetts-Cities-and-Towns-12-15-16.pdf>

Bruce, C.W. (2018). *Assessing the Impact of Gambling on Public Safety in Massachusetts Cities and Towns: Analysis of Changes in Police Data after Two Years of Operation at Plainridge Park Casino*. January 14.

<https://massgaming.com/wp-content/uploads/Assessing-the-Impact-of-Gambling-on-Public-Safety-in-Massachusetts-Cities-and-Towns-3-1-18.pdf>

Key Informant Interviews

The SEIGMA team conducted interviews from January 2018-March 2018 with key informants residing in Plainville, the location of PPC. The goal was to gain an on-the-ground understanding from local experts about the social and economic conditions in Plainville prior to hosting a casino, during the construction of the casino, and while hosting the casino. The SEIGMA team identified a select group of ‘key’ contacts from Plainville, who, through their professional expertise and experience working in the locale, could further inform understandings of the social and economic conditions within the host communities. We requested a single interview from potential key informants by contacting their professional offices by email and/or telephone. If a key informant agreed to an interview, the 60-90 minute interview was conducted by telephone. Prior to the interview commencing, formal consent was obtained. Questionnaires were tailored to the position of the key informant, as they expected to speak in their professional capacity when commenting on the impacts of the casino.

Interviews were audio recorded and transcribed. The interviews were not confidential as officials/representatives spoke in their professional capacity and in their area of expertise. Interviews were conducted with Jennifer Thompson, Plainville's Town Administrator; Kathleen Parker, Plainville's Treasurer; and Lou LeBlanc, Chairman of Plainville's Board of Health. We also contacted Plainville's Housing Authority, but board members were unwilling to participate in interviews concerning Plainville's housing market.

The Construction of Plainridge Park Casino: Spending, Employment, and Economic Impacts

This report describes the activities undertaken to construct PPC and measures the economic impacts generated through this process. The construction of PPC occurred over two phases: the architecture, engineering, and design phase (2010-2014) and the actual construction phase (2014-2015). In 2014-2015, secondary data from the construction management vendors was received on the spending, employment, and wages related to the construction of PPC and provided to the SEIGMA team. This report provides estimates of the total economic impacts to the Commonwealth of Massachusetts resulting from construction of the slot parlor.

Motamedi, R., & Peake, T. (2017). *The Construction of Plainridge Park Casino: Spending, Employment, and Economic Impacts*. Amherst, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group. March 7.

<https://www.umass.edu/seigma/sites/default/files/The%20Construction%20of%20Plainridge%20Park%20Casino%20-%20REVISED.pdf>

Plainridge Park Casino First Year of Operations: Economic Impacts Report

This report estimates the full economic impact of the first year of operations of the PPC on the Massachusetts economy utilizing secondary data from July 2015-June 2016. This report details two key aspects of operational effects. First, data were provided by PPC to determine the economic footprint of PPC's operations, including employment, wages, vendor spending, and fiscal impacts from taxes and other assessments paid to the state. Second, the report analyzes how shifts in patron spending as a result of the expansion of gambling would affect the state. A PI* model—Regional Economic Models Inc. (REMI)—was used to estimate the direct and spin-off effects in the Massachusetts economy associated with casino operations and patron spending.

Peake, T. & Motamedi, R. (2017). *Plainridge Park Casino First Year of Operation: Economic Impacts Report*. Amherst, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group. October 6.

<http://www.umass.edu/seigma/sites/default/files/PPC%20First%20Year%20Operating%20Report%202017-10-06.pdf>

New Employee Survey at Plainridge Park Casino: Analysis of the First Two Years of Data Collection

This report presents findings from the first two years of new employee survey data collection at PPC. The report details the employment opportunities offered by the casino operator and characteristics of the workforce at the point of hire by analyzing secondary data collected by the MGC from March 2015-March 2017. Key information collected from each applicant included: employment status prior to hire; whether the applicant currently works for the operator or is a new hire; reasons for seeking the job, whether the applicant moved to take the position;

and training received in preparation for work at the casino. This is the first of three new employee surveys. Over time, survey data from all three casinos will help workforce development boards and policymakers understand the types of employees who want to work at the casinos, the extent to which employees are being trained, the number of employees drawn from the local labor supply, and net new job creation.

University of Massachusetts Donahue Institute (UMDI) (2017). *New Employee Survey at Plainridge Park Casino: Analysis of First Two Years of Data Collection*. May 10.

[https://www.umass.edu/seigma/sites/default/files/PPC%20Employee%20Survey%20Report%202017-05-9 For%20Releasev2.pdf](https://www.umass.edu/seigma/sites/default/files/PPC%20Employee%20Survey%20Report%202017-05-9%20For%20Releasev2.pdf)

Patron and License Plate Survey Report: Plainridge Park Casino 2016

This report presents the results of the first patron survey at PPC, whereby the SEIGMA team administered a survey to 479 PPC patrons in both the summer and winter of 2016. These surveys provide the only data collected directly from casino patrons regarding their geographic origin and expenditures. These data are important to ascertain the influx of new revenues to the venue and the state, to measure any monies diverted from other sectors of the economy, and to document the demographics of casino patronage. The concurrent license plate survey assesses the accuracy of prior estimates of out-of-state casino expenditure and provides corroborating information about patron origins. These data provided the basis for the *Plainridge Park Casino First Year of Operations: Economic Impacts Report*, which estimates the direct and spin-off effects in the Massachusetts economy associated with casino patron spending from Massachusetts and non-Massachusetts residents.

Salame, L., Williams, R.J., Zorn, M., Peake, T., Volberg, R.A., Stanek, E.J., & Mazar, A. (2017). *Patron and License Plate Survey Report: Plainridge Park Casino 2016*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst.

<https://www.umass.edu/seigma/sites/default/files/PPC%20Patron%20Survey%20Report%202017-10-17.pdf>

Lottery Revenue and Plainridge Park Casino

The Massachusetts Lottery has provided fiscal year and agent-specific lottery sales data from 2003-2016 to the SEIGMA team. These reports analyze how lottery-product-buying behavior may be affected by the introduction of casino gambling in Massachusetts and analyze changes in sales at several levels, including statewide, in the host and designated surrounding communities near the casino, and for agents at different driving distances from the casino.

Nichols, M.W. (2017). *Lottery Revenue and Plainridge Park Casino: Analysis of First Year of Casino Operation*. Amherst, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group. January 19.

[https://www.umass.edu/seigma/sites/default/files/MA%20Lottery%20Revenue%20and%20Plainridge%20Park%20201%20Year%20Analysis%20\(final\).pdf](https://www.umass.edu/seigma/sites/default/files/MA%20Lottery%20Revenue%20and%20Plainridge%20Park%20201%20Year%20Analysis%20(final).pdf)

Nichols, M.W. (2018). *Lottery Revenue and Plainridge Park Casino: Analysis after Two Years of Casino Operation*. Amherst, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group.

Host Community Economic Profiles: Plainville, Springfield, and Everett

These reports utilize secondary data from 2003-2013 and present the economic profiles of Plainville, Springfield, and Everett to provide information on baseline economic conditions within host communities before the introduction of casinos. A specific set of variables have been selected to create a portrait of each place as well as select economic and fiscal data indicators for the MGC identified surrounding communities. The information illustrates recent trends and conditions within each city or town's industrial structure, business community, fiscal indicators, labor force, and residential population. These data provide a profile of the communities that will be updated after casinos are introduced in order to track economic changes over time.

University of Massachusetts Donahue Institute (UMDI) (2015). *Host Community Profile: Plainville*. October 20. https://www.umass.edu/seigma/sites/default/files/Plainville%20Host%20Community%20Profile_Final.pdf

University of Massachusetts Donahue Institute (UMDI) (2015). *Host Community Profile: Springfield*. October 20. https://www.umass.edu/seigma/sites/default/files/Springfield%20Host%20Community%20Profile_Final_0.pdf

University of Massachusetts Donahue Institute (UMDI) (2015). *Host Community Profile: Everett*. October 20. https://www.umass.edu/seigma/sites/default/files/Everett%20Host%20Community%20Profile_Final_0.pdf

Baseline Real Estate Conditions: Host Community Profiles: Plainville, Springfield, and Everett

These reports utilize secondary data from 2008-2014 and provide a summary of trends in the residential, commercial, and industrial real estate markets for the host communities of Plainville, Springfield, and Everett and their MGC designated surrounding communities. They serve as a companion to the Plainville, Springfield, and Everett Host Community Economic Profile reports which document baseline conditions on a variety of economic, demographic, and fiscal indicators. These reports document market conditions in the area prior to the introduction of a slots parlor or a major resort casino, establish a baseline for measuring potential development, and evaluate different data sources as well as techniques for identifying possible impacts.

Renski, H. & Peake, T. (2016a). *Baseline Real Estate Conditions: Host Community Profile: Everett*. Amherst, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group. August 30. [https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Everett_2016-08-30%20\(final\).pdf](https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Everett_2016-08-30%20(final).pdf)

Renski, H. & Peake, T. (2016b). *Baseline Real Estate Conditions: Host Community Profile: Plainville*. Amherst, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group. August 30. [https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Plainville_2016-08-30%20\(final\).pdf](https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Plainville_2016-08-30%20(final).pdf)

Renski, H. & Peake, T. (2016c). *Baseline Real Estate Conditions: Host Community Profile: Springfield*. Amherst, MA: University of Massachusetts Donahue Institute, Economic and Public Policy Research Group. August 30. https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Springfield_2016-08-30%20%28final%29_0.pdf

Measuring the Economic Effects of Casinos on Local Areas: Applying a Community Comparison Matching Method

This report provides an overview of community matching, one of the methods we will use to analyze the socioeconomic impacts of the new gambling venues. Community matching involves selecting a group of communities that are economically, socially, and demographically similar to the casino host communities in Massachusetts. Once casinos open in Massachusetts, comparisons of data trends between the casino host communities and their matched control communities will provide a relative assessment of the impacts of casinos over time. This method complements SEIGMA's other methods and enhances our overall assessment of the impacts of casinos.

Nichols, M.W. (2014). *Measuring the Economic Effects of Casinos on Local Areas: Applying a Community Comparison Matching Method*. November 5.

https://www.umass.edu/seigma/sites/default/files/Economic%20Effects%20of%20Casinos%20Matching%20Results%2011_5_14FINAL.pdf

SOCIAL AND HEALTH IMPACTS

PROBLEM GAMBLING AND RELATED INDICES

Prevalence and Incidence of Problem Gambling

Statewide Impacts

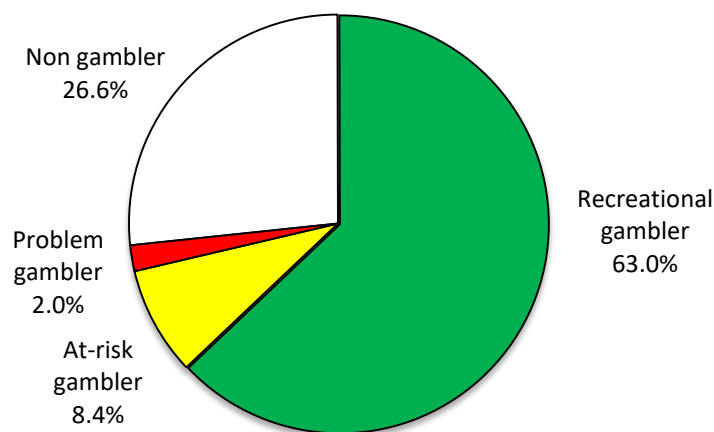
Baseline Levels

As seen in Figure 4, the Baseline General Population Survey determined that in 2013/2014, prior to any casino opening, approximately 2.0% of the general adult population of Massachusetts were Problem Gamblers, which is very similar to the rates seen in other U.S. states between 2004 to 2013 (Volberg, Williams, Stanek, Houpt, et al., 2017; Williams, Volberg, & Stevens, 2012). A 2.0% prevalence rate is estimated to represent approximately 105,738 individuals age 18+ in Massachusetts.

This survey employed the Problem and Pathological Gambling Measure (Williams & Volberg, 2014), which classifies people into one of four categories:

- **Non-Gamblers**, who have not engaged in any gambling in the past year;
- **Recreational Gamblers**, who show no signs of excessive gambling or problem gambling symptomatology;
- **At-Risk Gamblers**, who report some signs of problem gambling symptomatology and/or are gambling at very high levels; and
- **Problem Gamblers**, who have impaired control over their gambling that is also associated with significant negative consequences for themselves or others. The category of Problem Gambling includes a subcategory of 'Pathological Gambling' that denotes more severe and chronic forms of problem gambling.

Figure 4. Baseline Problem Gambling Prevalence in Massachusetts in 2013/2014, Weighted



Source: Volberg et al. (2017)

Changes over Time in Relation to Casino Introduction

The next statewide prevalence study of gambling and problem gambling is not scheduled until 2020 after all of the casinos have opened ('Follow-Up General Population Survey (FGPS)'). However, there have been two waves of the Massachusetts Gambling Impact Cohort (MAGIC) conducted in March – September 2015 (Wave 2) and March – August 2016 (Wave 3). After excluding individuals who were problem gamblers in both waves and weighting the data to the population of Massachusetts, the incidence of problem gambling between 2013/2014 and 2015 was determined to be 2.4% (1.5-3.7; 95% CI). The same analysis was conducted for Wave 2 to Wave 3. After excluding individuals who were problem gamblers in Wave 2 and weighting the data to the population of Massachusetts, there was an incidence of problem gambling between 2015 and 2016 of 1.2% (0.6-2.2; 95% CI). The higher incidence between Wave 1 and Wave 2 may be due to the longer 16.5-month inter-assessment interval compared to 12.5 months between Wave 2 and Wave 3¹¹, as well as some factors influencing retention between Wave 1 and Wave 2 that may not have been as strong between Wave 2 and Wave 3 (see Volberg et al., 2017 for discussion of these issues). Partly for this reason, as well as the fact that PPC opened between the end of Wave 2 and the beginning of Wave 3, the rest of this report focuses on Wave 2 to Wave 3 changes.

Restricting the analysis to just members of the cohort who participated in both Wave 2 and Wave 3, a McNemar test determined that the proportion of problem gamblers in the cohort was unchanged from Wave 2 in 2015 at 3.2% (2.6 - 4.0; 95% CI) to Wave 3 in 2016 at 3.1% (2.5-2.8; 95% CI). (Note: this is with dichotomizing the categories: i.e., problem gambler or non-problem gambler). Similarly, as seen in the table below, there was also no significant change in the prevalence of at-risk gambling. However, a significant decrease in non-gambling was observed along with a corresponding increase in recreational gambling (recognizing that these latter rates are interdependent on one another and that the large sample sizes facilitated statistical significance despite a fairly small change in prevalence).¹²

Table 8. Gambling Category Percentages in the MAGIC Cohort, 2015 and 2016

	Wave 2: 2015			Wave 3: 2016			<i>p</i>
	N	%	95% C.I.	N	%	95% C.I.	
Non-Gambler	376	15.4	(14.0 - 16.9)	332	13.6	(12.3 - 15.0)	.008
Recreational Gambler	1,662	68.0	(66.2 - 69.9)	1,737	71.1	(69.3 - 72.9)	.002
At Risk Gambler	327	13.4	(12.1 - 14.8)	299	12.2	(11.0 - 13.6)	.140
Problem Gambler	78	3.2	(2.6 - 4.0)	75	3.1	(2.5 - 3.8)	.726

N=total number of respondents who answered the question. Note that these percentages are simply for members of the cohort and should not be used to make estimates for the entire Massachusetts population.

Regional Impacts

Baseline Levels

As shown in Table 9, the Baseline Targeted Population Survey of Springfield (BTPS-Springfield) established that 3.3% of the adult population of the MGM Springfield H&SC were problem gamblers in 2015, which is somewhat

¹¹ Even though the survey asks about the past 12 months, people often use the last time they were asked these questions as the demarcation.

¹² In the McNemar test only people who change status over the two time periods contribute to the test statistic (people whose status is unchanged are not counted). Thus, it is often the case that a fairly small number of people influence the test statistic despite there being a large number of people in the table.

higher than estimates of prevalence for the state as a whole in 2013/2014 (i.e., 2.0%), although the lower confidence interval of 1.8% does overlap this 2.0%.

Table 9. Baseline Prevalence of Problem Gambling in MGM Springfield H&SC in 2015, Weighted

Gambling Category	BTPS-Springfield		
	N	%	95% CI
Non-Gambler	131,755	29.1	(25.4 - 33.2)
Recreational Gambler	266,215	58.8	(54.6 - 63.0)
At-Risk Gambler	39,337	8.7	(6.5 - 11.6)
Problem Gambler	<i>15,078</i>	<i>3.3</i>	<i>(1.8 - 6.1)</i>

N is the total number of respondents weighted to the Springfield H&SC population. Italics indicate a relative standard error of greater than 30%

Changes over Time in Relation to the Casino Introduction

The Plainridge Park Casino is the only venue that has opened over the time period covered by this impact report. The prevalence of problem gambling in the PPC H&SC a year before the casino opened (BTPS-Plainville) compared to roughly over a year after it opened (FTPS-Plainville) is reported in Table 10. Using a chi-square test, results show that there has been no significant change in the rate of problem gambling (or any of the gambling categories) between the two periods. This lack of change may be due to the fairly high level of casino patronage that existed in the PPC H&SC at baseline (23.2% as reported later in this report) combined with the very close proximity of the two Rhode Island casinos (Twin River, Newport Grand) and two Connecticut casinos (Foxwoods, Mohegan Sun). The majority of these four casinos are within one hour driving distance of most residents of the PPC H&SC and they have all been in operation since the early 1990s. In other words, ‘adaptation’ may have already occurred (LaPlante & Shaffer, 2007; Shaffer et al., 2004).¹³

Table 10. 2014 Baseline versus 2016/2017 Follow-Up Prevalence of Problem Gambling in PPC H&SC, Weighted

Gambling Category	BTPS-Plainville			FTPS-Plainville			p
	N	%	95% CI	N	%	95% CI	
Non-Gambler	58,236	19.8	(16.7 - 23.4)	57,015	19.3	(16.0 - 23.1)	.838
Recreational Gambler	208,689	70.9	(66.8 - 74.7)	209,077	70.8	(66.4 - 74.7)	.948
At-Risk Gambler	19,631	6.7	(4.6 - 9.7)	24,116	8.2	(5.8 - 11.4)	.432
Problem Gambler	7,586	2.6	(1.4 - 4.6)	<i>5,276</i>	<i>1.8</i>	<i>(0.8 - 3.8)</i>	.439

N is the total number of respondents ($n = 1,093$ for BTPS and $n=1,012$ for FTPS) weighted to the PPC H&SC population
Italics indicate a relative standard error of greater than 30%

Three key informants from Plainville also indicated no obvious impact of the casino on problem gambling:

“Whether or not problem gambling exists in the town ... but no reports have come to us, residents have not come to us with concerns that there has been an increased in problem gambling.” Jennifer Thompson, Town Administrator, Plainville, MA, January 25, 2018, 10am-11am, phone interview.

¹³ Most harms associated with gambling occur after it is first introduced because the population has little experience/knowledge about the product, and its novelty encourages high rates of participation. However, with time, participation rates go down because the novelty decreases, and the population’s familiarity with the product (and potentially adverse experience) helps inoculate them from further harm (LaPlante & Shaffer, 2007; Shaffer et al., 2004).

“What people were concerned about during those times, the negative vote, we heard all of the typical things ... problem gambling, increased crime. ... If we were to run that vote right now, my gut just tells me just by the interactions that I have with people, that they would not be unfavorable today. Because they have seen that all the doom and gloom simply did not happen. At least in Plainville.” Kathleen Parker, Treasurer of Plainville, MA; February 1, 2018, 11-12pm, 2018, phone interview.

“I don’t really see any impact on the health and well-being of the people of Plainville. Conditions now seem to be as they were prior to the opening of the casino....There was already gambling here This isn’t something new, it is just vastly improved. So there was a potential to have an issue, but as of this date, we have not seen any indicators of that.” Lou LeBlanc, Chairman of the Board of Health, Plainville, MA; March 1, 2018, 5-6pm, phone interview.

Treatment Seeking for Problem Gambling

Statewide Impacts

Baseline Levels

The Baseline General Population Survey (BGPS) in 2013/2014 asked all problem gamblers whether they wanted help for their gambling problems and whether they had actually sought help. Only a small minority reported wanting help and an even smaller number actually sought help (Volberg, Williams, Stanek, Houpt et al., 2017). Estimates of the percentages and population numbers were not reported since the standard error was >30%. To arrive at more reliable estimates a supplemental Baseline Online Panel Survey (BOPS) of 5,046 Massachusetts adults (18+) was conducted between October 2013 to March 2014 (Williams, Pekow, Volberg, et al., 2017). The Baseline Online Panel Survey (BOPS) found that 25.2% of problem gamblers¹⁴ wanted help for their problems, with 16.1% actually seeking help, and 24.3% reported having entered into a casino self-exclusion agreement.

The number of [Gamblers Anonymous](#) (GA) and [Bettors Anonymous](#) (BA) meetings held in Massachusetts was also investigated. In February 2018 the GA website showed that there were 40 locations where weekly meetings of Gamblers Anonymous took place. BA meetings are less common. In February 2018 the BA website showed that there were four locations where weekly meetings took place. Unfortunately, no data was available from either GA or BA websites concerning the number of meetings or their locations in previous years.

A related issue is the economic cost of treating problem gamblers. Rodriguez-Monguió, Brand, & Volberg (2018) accessed the Massachusetts All-Payer Claims Data ([CHIA](#)) for the period 2009 to 2012 and identified 599 unique adult patients with a primary International Classification of Diseases (ICD-9-CM) diagnosis of pathological gambling who had received commercially insured treatment (269 patients in 2009, 411 in 2010, 386 in 2011, and 357 in 2012). The mean annual total expenditure for these individuals was \$9,166 per year averaged across the

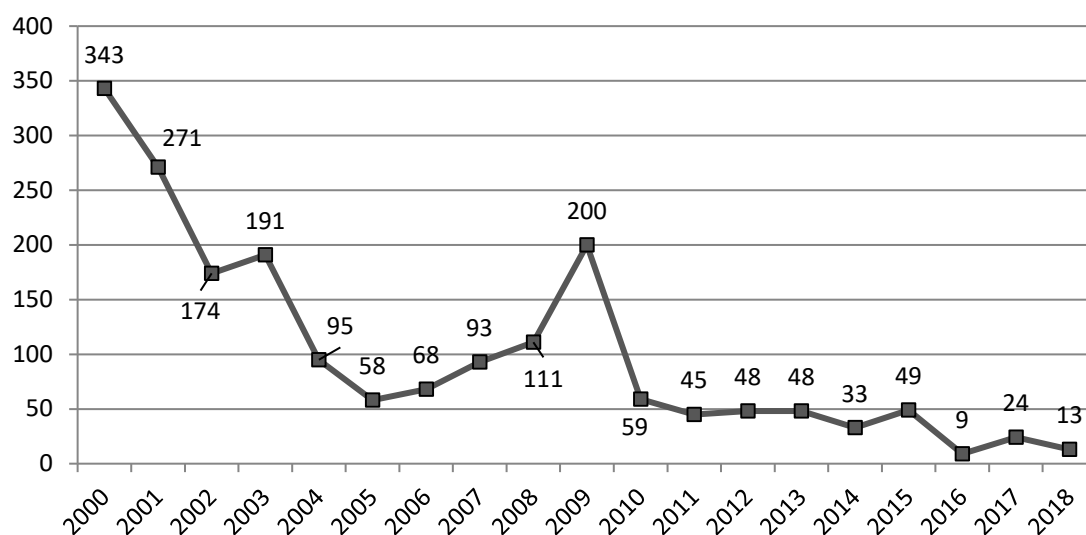
¹⁴ In the specific case of ‘treatment seeking’ problem gambling is defined as having a Problem Gambling Severity (PGSI) score of 5 or higher on the Canadian Problem Gambling Index (Ferris & Wynne, 2001). The PGSI was employed because of the much more complicated scoring algorithm that would have been required to calculate PPGM categories (as treatment seeking was asked at the end of the survey, but only to problem gamblers). Previous research has established that a PGSI score of 5 and higher is roughly equivalent to a PPGM categorization of problem gambler (Williams & Volberg, 2014). Note that in all other cases when ‘problem gambler’ is used it refers to PPGM problem gamblers. Note: people who were asked about wanting help and seeking help were not told they had been classified as problem gamblers by the PGSI.

four years.¹⁵ This included outpatient and inpatient treatment, emergency room visits, and prescription drugs for the treatment of pathological gambling as well as the comorbid substance use and mental health conditions common in these individuals. It should be noted that these data do not include people with Medicaid coverage (19% of Massachusetts residents)¹⁶, people with Medicare coverage (16% of Massachusetts residents), people with pathological gambling as a *secondary* diagnosis, people without insurance coverage (4% in 2015), and problem gamblers accessing free counselling and support services (e.g., Gamblers Anonymous).

Changes over Time in Relation to Casino Introduction

There are several sources of data that speak to treatment seeking among problem gamblers in Massachusetts over time. Most important is the actual number of intakes for problem gambling treatment reported by the Massachusetts Department of Public Health (MDPH) which contracts gambling outpatient treatment services in the state.¹⁷ These data are reported in Figure 5 and is taken from MDPH (2017a) as well as a personal communication from Victor Ortiz (Director of Problem Gambling Services) and Loc Tran on May 1, 2018. As can be seen, there is actually a decline in the number of intakes reported to MDPH from 2000 to 2018 (April). This decline occurred even though the number of sites available to provide problem gambling treatment increased from six in 2007 to a high of 44 in 2016 and a total of 41 in 2018 (through to April) (MDPH, 2017a; personal communication from Victor Ortiz on May 2, 2018). The reasons for the decline are uncertain, as is the reason for the increase in reported intakes in 2009.

Figure 5. Problem Gambling Treatment Intakes reported to Department of Public Health, 2000-2018



Source: MDPH, 2017a; personal communication from Victor Ortiz

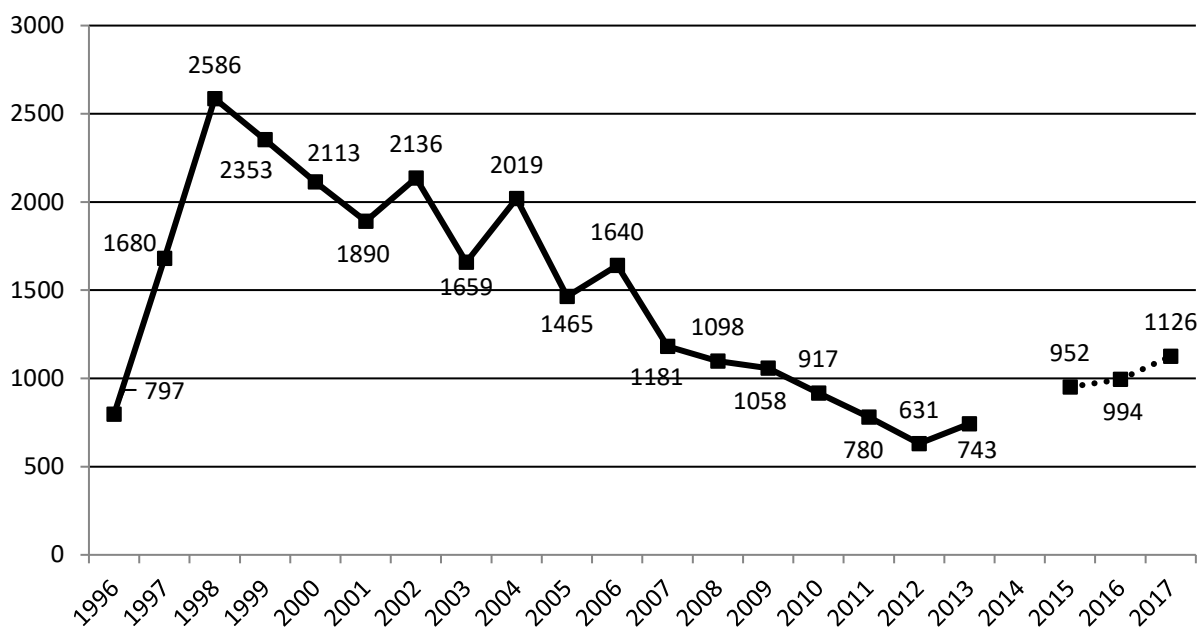
¹⁵ As a reference point, total public and private health care expenditures for Massachusetts residents averaged \$8,907 per capita in 2017 (\$61.1 billion divided by the population of Massachusetts) (CHIA, 2018).

¹⁶ While Medicaid patients tend to have a higher prevalence of illness and use more services, Medicaid expenditures are based on negotiated reimbursement rates which results in lower per capita expenditures compared with the commercially insured population in spite of higher healthcare needs (Rodriguez-Monguio, personal communication, May 2, 2018).

¹⁷ MDPH is the payer of last resort for problem gambling treatment. These intakes are clients for whom treatment providers were unable to obtain insurance coverage for other diagnosed disorders.

Another source of data concerns the number of helpline calls to the [MA Council on Compulsive Gambling \(MCCG\)](#). Data up to 2014 is reported in Houpt, Volberg, Williams et al. (2015) and MCCG (2014), and data subsequent to 2014 was supplied by Phil Kopel (Data Management and Evaluations Director) at MCCG in 2018. The combined dataset is displayed in Figure 6. Because of different data tabulation approaches, the data from 1996-2013 is not directly comparable to the data from 2015-2017. The data shows that the number of calls peaked in 1998 and has declined up to the present time, albeit with some possibility of a minor rise from 2015 to present.¹⁸ Some of this decrease may be due to greater online access of information. The number of annual visits to the help pages of the MCCG website has consistently been above 7,000 since 2009. It is unclear whether these visits have increased over time. Data provided prior to 2015 (Haupt, Volberg, Williams et al., 2015; MCCG, 2014), indicated a tripling of visits from 2009 to 2014. However, the most recent data indicates that the number of visits in 2014 was roughly equivalent to the number of visits in 2009, but also that the number of visits tripled from 2014 to 2016, and with a slight decline in 2017.

Figure 6. Number of Annual Calls to the MCCG Help Line, 1996-2017



Source: Houpt, Volberg, Williams et al. (2015), MCCG (2014), and Phil Kopel (2018)

Finally, in the MAGIC cohort, when restricting the analysis to members of the cohort who participated in both Wave 2 and Wave 3, 3.5% (1.3-9.1; 95% CI; $n = 1-4/113$) of problem gamblers in Wave 2 in 2015 reported that they wanted help for their gambling problems in the past year and 0.9% (0.1-6.0; 95% CI; $n = 1-4/113$) reported seeking help. In Wave 3 in 2016, 5.3% (2.4-11.3; 95% CI; $n = 6/113$) of problem gamblers reported wanting help for gambling problems in the past year and 3.5% (1.3-9.1; 95% CI; $n = 1-4/113$) indicated that they had sought

¹⁸ It is interesting to note that the trends in both Figure 5 and Figure 6 parallel the overall North American trend in problem gambling prevalence, which also peaked in the late 1990s (coincident with a significant introduction and expansion of legal gambling opportunities) with declines until the present time (Williams, Volberg, & Stevens, 2012).

help. A McNemar test of paired nominal data showed the changes from 2015 to 2016 were nonsignificant in both cases ($p = .41$ and $p = .08$ respectively)¹⁹.

Regional Impacts

Baseline Levels

A voluntary Self Exclusion program has been in operation at PPC since its opening in June 2015. (This is where a person can ask the casino to bar himself or herself from entry for a specified period of time). As of August 2017, 218 people were actively enrolled in the program (Cambridge Health Alliance, 2017).

Changes over Time in Relation to Casino Introduction

In the 2014 Plainville Baseline Targeted Population Survey (BTPS-Plainville) there were no problem gamblers who reported that gambling had caused them to want help or to seek help in the past year. In the 2016/2017 Plainville Follow-Up Targeted Population Survey (FTPS-Plainville) there were again no problem gamblers who reported wanting or seeking help.

Of the 40 [Gamblers Anonymous](#) (GA) meetings in Massachusetts, one meeting is held in Plainville, four in the Springfield area (Holyoke, Indian Orchard, Longmeadow (2)), and two in the Everett area (Malden, Chelsea). The three [Bettors Anonymous](#) (BA) meetings in Massachusetts are held in Methuen (26 miles from Everett) and Wilmington (15 miles from Everett).

The Plainville GA meeting is not new. The secretary for the [New England Intergroup of Gamblers Anonymous](#) sent an email to the SEIGMA team on March 7, 2018 stating:

"...the Plainville meeting was established 30 years ago. It first started at Wrentham Hospital and then moved to the current location (Plainville United Methodist Church) about 15 years ago. There is also a West Bridgewater meeting that was established 14 years ago and a Taunton meeting that was established 19 years ago."

In response to an inquiry from the SEIGMA team, one of the laity from Plainville United Methodist Church sent an email on March 8, 2018 stating:

"We have had GA meetings here for approximately 20 years. At present about 15 people attend these meetings each week. We have not seen any increase in attendance since Plainridge (Casino) opened."

¹⁹ The sample for the McNemar test consisted of all individuals who were problem gamblers in either 2015 or 2016. It is assumed that individuals who were not asked about wanting help or seeking help (because they did not score as problem gamblers in that year), did not want or seek help for problem gambling in that year.

Financial Problems, Bankruptcy, Employment Problems

Statewide Impacts

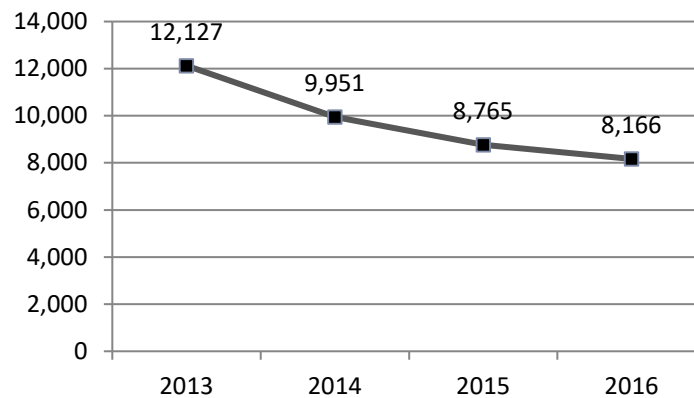
Baseline Levels

In the 2013/2014 BGPS a total of 3.8% (2.9-5.0; 95% CI; $n = 100/3993$) of regular gamblers reported financial problems because of gambling and 0.3% (0.1–0.9; 95% CI; $n = 9/3928$) reported filing for bankruptcy because of gambling.²⁰

Changes over Time in Relation to Casino Introduction

It is very unlikely there would be any statewide changes in bankruptcy as a result of the introduction of a single casino. Even if there was, the ability to attribute these changes to casino introduction is tenuous. Nonetheless, in the interests of comprehensiveness, Figure 7 displays the number of personal bankruptcy filings per year in Massachusetts as recorded by [U.S. Courts](#) (2018) from 2013 to 2016. As can be seen, there has been a steady decline in personal bankruptcy filings since 2013.

Figure 7. Personal Bankruptcy Filings per Year in Massachusetts, 2013-2016



Source: U.S. Courts

Finally, in the MAGIC study, when restricting the analysis to members of the cohort who participated in both Wave 2 and Wave 3, 2.8% (2.1-3.7; 95% CI; $n = 46/1634$) of regular gamblers²¹ in Wave 2 in 2015 reported that gambling had caused them to have financial problems in the past year compared to 2.5% (1.9-3.4; 95% CI; $n =$

²⁰ No estimates are given for gamblers in the Baseline Online Panel Survey (BOPS), as these individuals are more heavily involved in gambling relative to gamblers in the general population (as represented by the BGPS). No estimates are given for *problem* gamblers in either the BGPS or BOPS, as 'gamblers' is a more inclusive group (i.e., there will be a small number of people who report a significant negative impact of gambling who are not identified as problem gamblers).

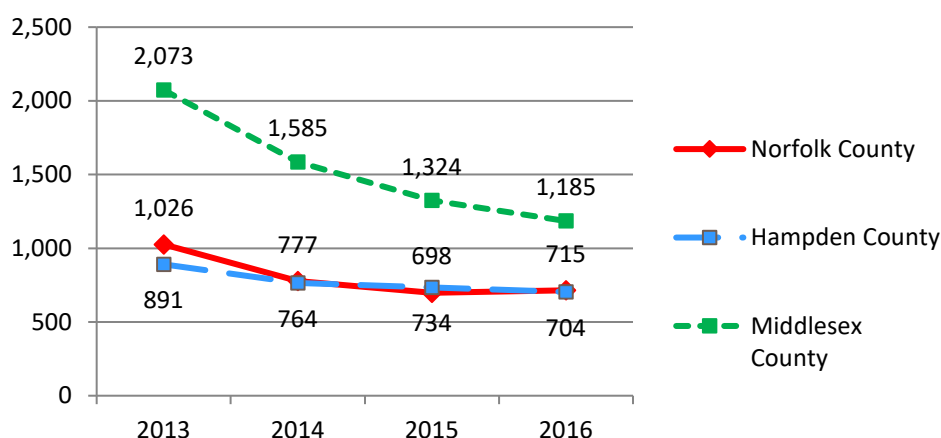
²¹ A 'regular gambler' in this report is defined as someone who gambled at least once a month or more and/or who reports that gambling is a very important recreational activity and/or who reports that gambling has replaced other recreational activities in the past five years. Note also that MAGIC assesses fewer negative impacts compared to the BGPS and BTPS.

41/1634) in Wave 3 in 2016. A McNemar test showed this to be a nonsignificant change ($p = .43$).²² Similarly, when restricting the analysis to members of the cohort who participated in both Wave 2 and Wave 3, only 0.2% of regular gamblers (0.1-0.6; 95% CI; $n = 1-4/1634$) in Wave 2 in 2015 reported that gambling had caused significant work or school problems for them in the past year, whereas 0.3% of regular gamblers (0.1-0.7; 95% CI; $n = 5/1634$) reported this in Wave 3 in 2016. The change was nonsignificant ($p = .48$).

Regional Impacts

Figure 8 displays the number of personal bankruptcy filings per year as recorded by [U.S. Courts](#) (2018) from 2013 to 2016 in Norfolk County (where PPC is located), Hampden County (where MGM Springfield is located), and Middlesex County (where Encore Boston Harbor is being built). Here again, there is a decline in personal bankruptcies in all three counties since 2013.

Figure 8. Personal Bankruptcy Filings per Year in Counties with Current or Future Casinos, 2013-2016



Source: U.S. Courts

In the 2014 BTPS-Plainville, 4.5% (2.0-9.9; 95% CI; $n = 8/471$) of regular gamblers reported that gambling had caused them to have financial problems in the past year and no regular gamblers reported filing for bankruptcy. A chi-square test found no significant change relative to the 2016/2017 FTPS-Plainville, with 2.8% (1.0-7.3; 95% CI; $n = 6/416$) of regular gamblers reporting that gambling had caused them to have financial problems in the past year ($p = .45$) and no regular gamblers reporting filing for bankruptcy. Similarly, in the 2014 BTPS-Plainville there were no regular gamblers (0%; $n = 0/464$), who reported that gambling had caused them significant work or school problems in the past year and no regular gamblers (0%; $n = 0/464$), who had had lost their job or quit school because of gambling. In the 2016/2017 FTPS-Plainville there were just 2.4% (0.7-7.4; 95% CI; $n = 1-4/411$) of regular gamblers who reported work or school problems because of gambling and 0% ($n = 0/411$) who reported losing their job or quitting school because of gambling. The change in work and school problems was nonsignificant ($p = .10$).

²² The sample for all McNemar tests in this report consists of everyone who was asked the particular question in either 2015 or 2016. In the present case, a small percentage of people were not asked about harmful impacts in both 2015 or 2016 because they did not meet the criteria for 'regular gambler' in one of those years. All these individuals are assumed not to have experienced that harmful impact in that year.

Divorce, Separation, Domestic Violence, Child Abuse and Neglect

This section pertains to the potential negative family impacts of gambling in terms of divorce, separation, restraining orders, domestic violence, and child welfare involvement (abuse/neglect).

Statewide Impacts

Baseline Levels

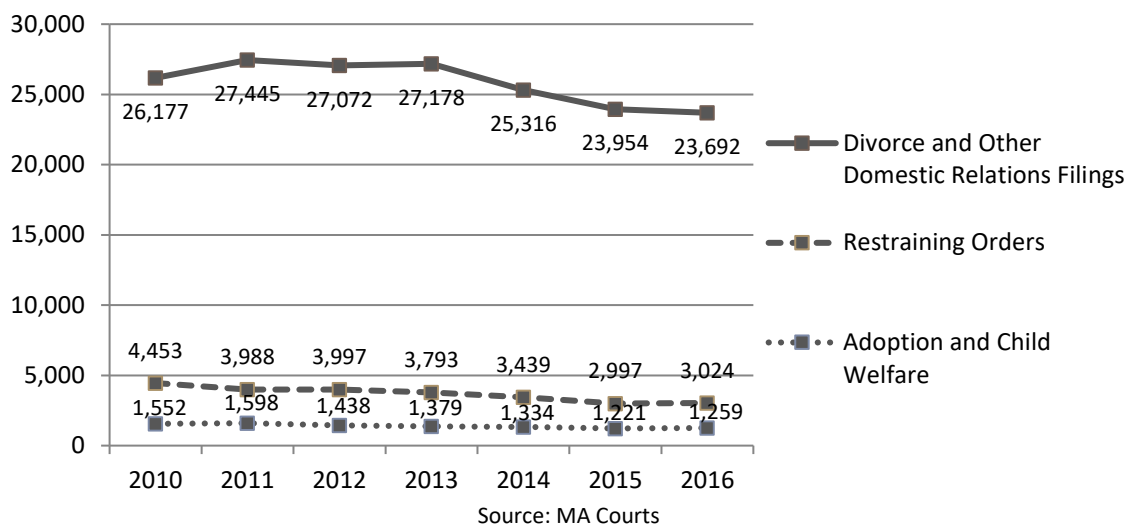
In the 2013/2014 BGPS a total of 1.1% (0.7-1.9; 95% CI; $n = 35/3993$) of regular gamblers reported relationship problems because of gambling; 0.3% (0.1–0.9; 95% CI; $n = 6/3928$) reported domestic violence because of gambling; 0.3% (0.1-0.9; 95% CI; $n = 8/3993$) reported neglecting their children or their family because of gambling; and 0.2% (.03-1.04; 95% CI; $n = 1-4/3928$) reported being separated or divorced because of gambling. No one reported receiving child welfare services because of gambling.

Changes over Time in Relation to Casino Introduction

Here again, it is very unlikely there would be any statewide changes in family-related indices as a result of the introduction of a single casino. Even if there was, the ability to attribute these changes to casino introduction is tenuous. Nonetheless, data on statewide trends is included for context and comprehensiveness. Figure 9 displays the annual number of 'divorce and other domestic relation filings'²³, restraining orders, and adoption and child welfare cases in Massachusetts from 2010 to 2016 as provided by MA Courts (2018).

Figure 10 displays the annual number of children receiving a child maltreatment investigation from 2010 to 2015 as reported by the U.S. Department of Health Human Services – Children's Bureau (US Dept Health & Human Services, 2018).²⁴ As seen, there are no marked differences from 2015 to 2016.

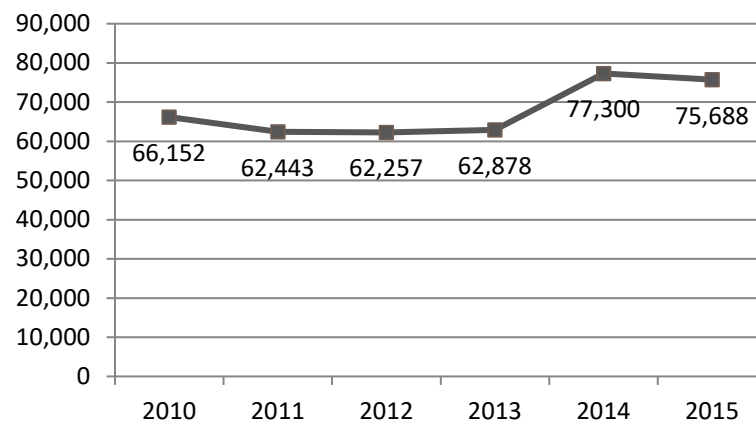
Figure 9. Massachusetts Family Impact Indices, 2010-2016



²³ Primarily filings for separation and child custody.

²⁴ Other sources of data on child maltreatment include the MA Department of Children & Families, KidsCount, and MassCHIP. However, these agencies only have data available up to 2009 or 2010.

Figure 10. Children Receiving a Child Maltreatment Investigation in Massachusetts, 2010-2015



Source: US Dept Health & Human Services

In the MAGIC study, when restricting the analysis to members of the cohort who participated in both Wave 2 and Wave 3, in Wave 2 in 2015, 1.0% (0.6-1.7; 95% CI; $n = 17/1634$) of regular gamblers reported that gambling had caused them to have significant relationship problems in the past year and 0.1% (0.0-0.5; 95% CI; $n = 1-4/1634$) of regular gamblers reported that gambling had caused them to repeatedly neglect their children or family. In Wave 3 in 2016, a very similar percentage of regular gamblers (1.3%; 0.8-2.0; 95% CI; $n = 21/1634$) reported that gambling had caused them to have significant relationship problems in the past year and 0.4% (0.2-0.8; 95% CI; $n = 6/1634$) of regular gamblers reported that gambling had caused them to repeatedly neglect their children or family. A McNemar test found no significant change from 2015 to 2016 in relationship problems ($p = .41$) or neglect of children or family ($p = .16$).

Regional Impacts

Changes over Time in Relation to Casino Introduction

The following figures display the annual number of 'divorce and other domestic relation filings', restraining orders, and adoption and child welfare cases in Norfolk County where PPC is located (Figure 11), Hampden County where MGM Springfield is located (Figure 12), and Middlesex County where Encore Boston Harbor is being built (Figure 13) as provided by data from MA Courts (2018). No marked changes subsequent to 2015 are evident.

Figure 11. Norfolk County Family Impacts, 2010-2016

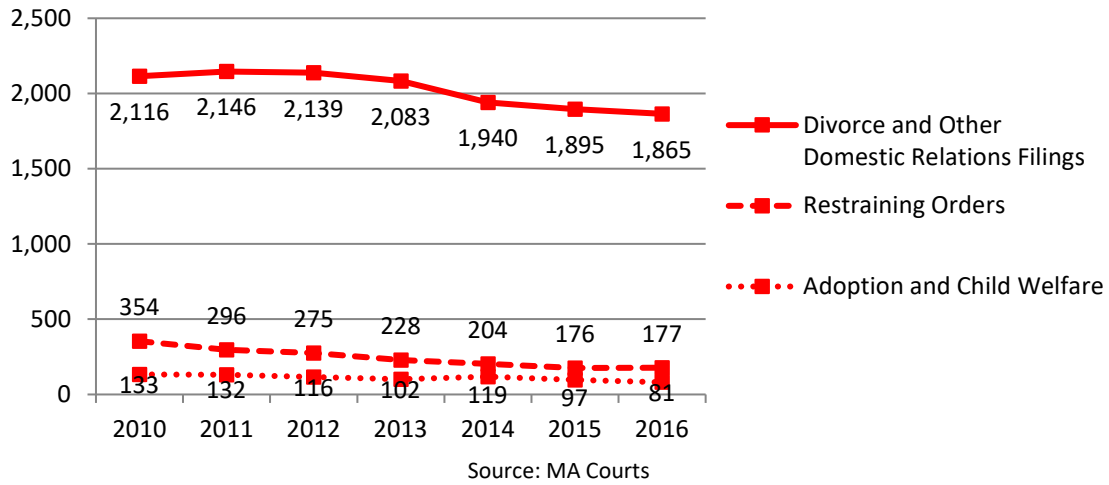


Figure 12. Hampden County Family Impacts, 2010-2016

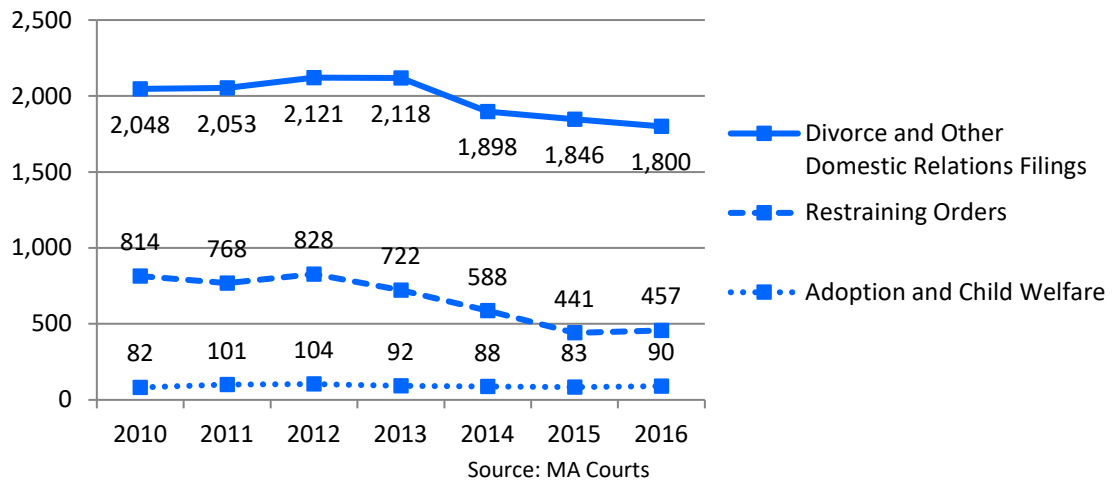
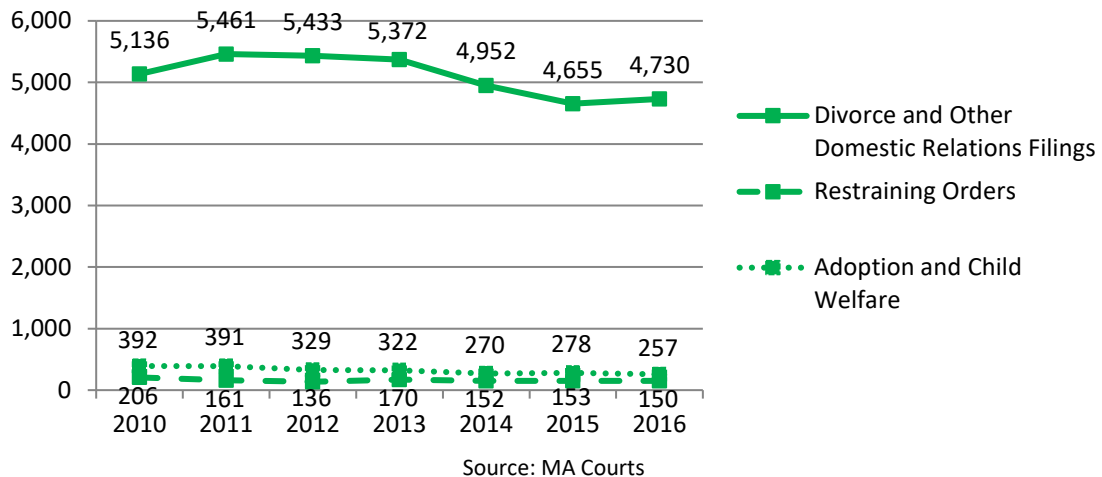


Figure 13. Middlesex County Family Impacts, 2010-2016



The following table identifies the number of regular gamblers in the 2014 BTPS-Plainville that reported a family-related impact in the past 12 months they attributed to gambling compared to the number of regular gamblers who reported that impact in the 2016/2017 FTPS-Plainville. These reported impacts are uncommon in both assessment periods with no evident change from 2014 to 2016/2017.

Table 11. Family Impacts Attributable to Gambling in the Plainville Targeted Population Surveys

Impact	BTPS-Plainville 2014	FTPS-Plainville 2016/2017
Significant relationship problems	1.5%; 1-4/463	1.0%; 1-4/413
Divorced or separated	0%; 0/463	0/413
Domestic violence	0%; 0/463	0/412
Neglect of children	0%; 0/466	0/413
Child Welfare Involvement	0%; 0/466	0/413

Suicide

Statewide Impacts

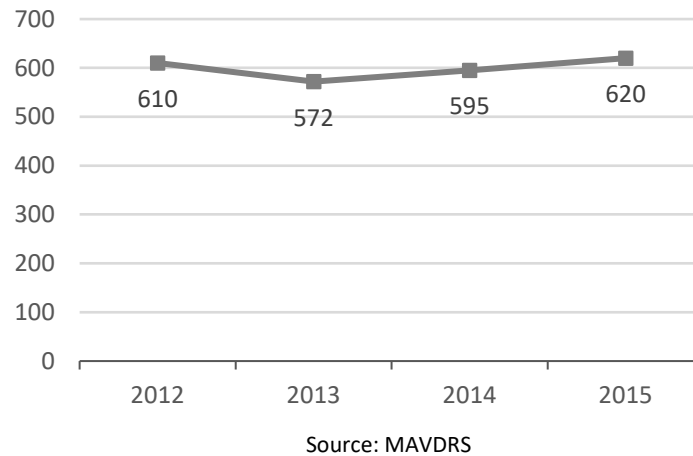
Baseline Levels

A total of 0.4% (0.1 – 0.9; 95% CI; $n = 10/3942$) of regular gamblers in the BGPS reported suicidal thoughts because of gambling and 0.07% (.02-.22; 95% CI; $n = 1-4/3934$) reported actual suicide attempts due to their gambling. As reference points, there were 572 known suicides in Massachusetts in 2013 (MAVDRS, 2013) and the Centers for Disease Control and Prevention estimate the ratio of suicidal ideation to suicide attempts in the United States to be roughly 7.2 to 1 and the ratio of suicide attempts to completed suicides to be roughly 31.6 to 1 (Centers for Disease Control & Prevention, 2015).

The Massachusetts Department of Public Health records annual Emergency Department visits for self-inflicted injuries. In 2012 there were 6,459 cases (97.2 cases per 100,000 residents), in 2013 there were 7,199 cases (107.6 cases per 100,000 residents) and in 2014 there were 6,885 cases (102.1 cases per 100,000 residents) (MDPH, 2017b). No data is available beyond 2014.

The Massachusetts Violent Death Reporting System (MAVDRS) (2018) tabulates confirmed suicides in the state (excluding non-residents or unknown). This data is presented in Figure 14. No data is currently available beyond 2015.

Figure 14. Annual Suicides in Massachusetts, 2012-2015

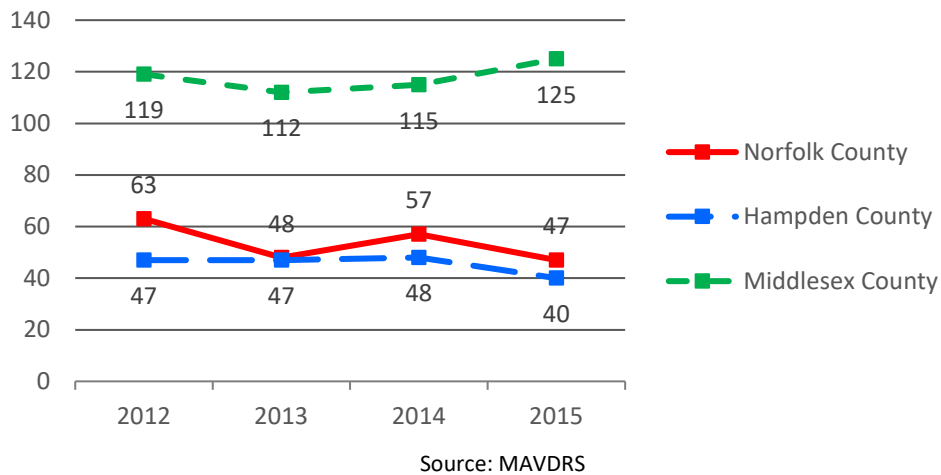


Regional Impacts

Baseline Levels

Figure 15 displays the number of suicides per year as recorded by [MA Violent Death Reporting System \(MAVDRS\)](#) (2018) from 2012 to 2015 in Norfolk County (where PPC is located), Hampden County (where MGM Springfield is located), and Middlesex County (where Encore Boston Harbor is being built). Here again, no data is available beyond 2015.

Figure 15. Annual Suicides in Selected Massachusetts Counties, 2012-2015



Changes over Time in Relation to Casino Introduction

In the 2014 BTPS-Plainville there were 0.5% (0.2-1.9; 95% CI; $n = 1-4/465$) regular gamblers who reported that gambling had caused them to have suicidal ideation in the past year in 2014 compared to 0.9% (0.2-4.0; 95% CI; $n = 1-4/418$) regular gamblers who reported this in 2016/2017. No significant change between the two periods was found ($p = .65$)

CRIME

Overall Crime Rates

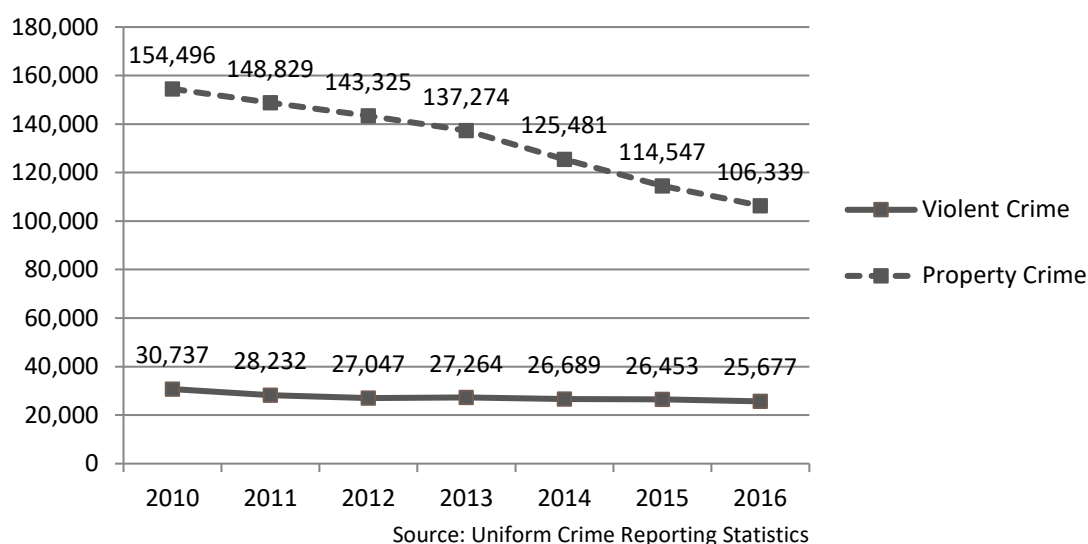
Statewide Impacts

It is very unlikely there would be any statewide changes in crime as a result of the introduction of a single casino. Even if there was, the ability to attribute these changes to casino introduction is tenuous. The following data is presented in the interests of context and comprehensiveness.

In the 2013/2014 BGPS, committing illegal acts because of gambling was the least common negative impact of gambling, reported among 0.5% (0.3-0.8; 95% CI; $n = 18/3993$) of regular gamblers. Being arrested, convicted, and incarcerated because of gambling were even less common, reported by .02% (0.0-0.2; 95% CI; $n = 1-4/3928$) of regular gamblers.

Figure 16 documents the number of criminal offenses recorded by law enforcement in Massachusetts from 2010 to 2016 as derived from Uniform Crime Reporting statistics (FBI, 2018). Continual downward trends are evident, with this being more pronounced for property crime.

Figure 16. Criminal Offenses Known to Law Enforcement in Massachusetts, 2010-2016



In the MAGIC study, when restricting the analysis to members of the cohort who participated in both Wave 2 and Wave 3, in Wave 2 in 2015 there were 0.3% (0.1-0.7; 95% CI; $n = 5/1634$) regular gamblers who reported that gambling had caused them to commit illegal acts to support their gambling compared to 0.3% (0.1-0.7; 95% CI; $n = 5/1634$) in Wave 3 in 2016. A McNemar test found no significant change between the two time periods ($p = 1.0$).

Regional Impacts

As reported by Bruce (2018), there were 2,906 incidents recorded by the Gaming Enforcement Unit at PPC in the two years subsequent to opening. The large majority of these were calls for service rather than actual crimes, with the top five categories being: assistance to PPC security ($n = 977$); assistance to 'other' agencies ($n = 564$); suspicious persons ($n = 411$); theft, fraud, and embezzlement (with theft of people's gambling credit tickets and personal property being particularly common) ($n = 295$); and intoxicated persons ($n = 252$).

Plainville police records provide better information concerning whether the opening of the slot parlor in June 2015 resulted in more crime at the Plainridge venue, as these records also document incidents prior to 2015 when the facility was a racetrack. Table 12 shows that the opening of the slot parlor was associated with a significant increase in both property crime and total crimes. Indeed, PPC became the Plainville Police Department's top crime and call-for-service location in 2016 and 2017 (Bruce, 2018).

Table 12. Crimes and Calls for Service at Plainridge pre and post Casino Opening Recorded by Plainville Police

	2-Years Prior to June 2015 at Plainridge Racecourse	June 2015 – July 2017 at Plainridge Park Casino
Total Crime Offenses	10	90
Property Crime Offenses	6	47
Violent Crime Offenses	0	0
Calls for Service	1,130	1,566

Source: Bruce (2018)

However, the number of crimes associated with a facility is strongly related to the number of visitors that it attracts (as well as whether the new facility serves alcohol). With Plainridge Park Casino attracting significantly more visitors than Plainridge Racecourse, this increase in crime and calls for service is not unexpected and not necessarily different from what would occur with a non-gambling facility (e.g., stadium, shopping mall). The more important question is whether there is a net increase in total crime in the Town of Plainville and the surrounding communities (inclusive of the PPC incidents).

The total number of crimes recorded by Plainville police in the Town of Plainville pre and post PPC opening is reported in Table 13 (adapted from Bruce, 2018). This table shows that there was no significant change in the overall annual number of crimes or the main categories of property and violent crimes in Plainville from 2010-2015 compared to 2016-2017. This is the case even though Plainville has experienced a significant increase in population (Figure 23 later in this report); and there was a 36% increase in the number of police officers hired (14 to 19) to mitigate potential crime impacts.

It is possible these broad crime categories hide changes in individual crimes/incidents. Examination of the 46 individual categories of crime and calls for service which (Bruce, 2018) details shows that there are 7 categories with an average z-score increase of 2.58 or greater (equivalent to a p value of .01, two-tail test) in the 2 years post-opening.²⁵ Listed in order from largest to smallest z-score increase, these are: suspicious activity, kidnapping, family offenses (domestic assault, child neglect, violation of restraining order), aggravated assault, credit card fraud, lost property, and traffic complaints. By comparison, there was only 1 category with a z-score decrease of 2.58 or greater: public drunkenness. Attributing the increase in these individual crimes to PPC is

²⁵ Due to the multiple comparisons, a more conservative z-score was employed in the present analysis compared to the 1.5 z-score utilized by Bruce (2018).

tenuous due to the fact that a) there was no mention of ‘gambling’, ‘casino’, or ‘Plainridge’ in a scan of the original written police reports (Bruce, 2018); b) there were no reports of any violent crime at PPC (see Table 12); and c) some increase is anticipated due to increased population. In consideration of all the data Bruce (2018) concludes that the only individual categories that are likely attributable to the casino are the increases in credit card fraud, lost property reports, reports of suspicious activity, and traffic complaints.²⁶

Table 13. Average Annual Number of Crimes in Town of Plainville pre and post Casino Opening

	2010 – 2015 Annual Average	2016 – 2017 Annual Average	% Change	Average z-score Change
Total Crime Offenses	301.8	285.5	5.4% decrease	-0.49
Property Crime Offenses	208.6	187.5	10.1% decrease	-0.82
Violent Crime Offenses	29.6	37.5	26.7% increase	+1.25

Source: Bruce (2018)

The total number of crimes recorded by police in the Town of Plainville *plus* the surrounding communities of Attleboro, Foxborough, Mansfield, North Attleborough, and Wrentham pre and post PPC opening is reported in Table 14 (adapted from Bruce, 2018). This table shows that there has been a significant *decrease* in the overall annual number of crimes and the number of property crimes in the PPC H&SC in 2016-2017 compared to 2010-2015 (using a z-score of 1.96²⁷).

Of the 46 individual categories, there were 6 with a significant increase ($z > 2.58$) in the 2 years post-opening. Listed in order from largest to smallest these were: lost property, fraud/con games, psychological, family offenses, theft from persons, and credit card fraud. By comparison, there were 2 categories with an average z-score decrease of 2.58 or greater. Listed in order from largest to smallest these were: ‘other’ theft and auto theft. In consideration of all the data as well as comparisons with control communities, Bruce (2018) concludes that the only individual category that is likely attributable to the casino is the increase in credit card fraud.

Table 14. Average Annual Number of Crimes in PPC H&SC pre and post Casino Opening

	2010 – 2015 Annual Average	2016 – 2017 Annual Average	% Change	Average z-score Change
Total Crime Offenses	8,305.4	7,103.5	14.5% decrease	-2.34
Property Crime Offenses	3,904.6	3,466.0	11.2% decrease	-2.08
Violent Crime Offenses	870.4	943.0	8.3% increase	+1.58

Source: Bruce (2018)

Another source of data pertaining to crime is the Targeted Population Surveys. In the 2014 BTPS-Plainville there were no regular gamblers who reported that gambling had caused them to commit an illegal act and no one who reported that they had been arrested for committing a crime due to their gambling. In the 2016/2017 FTPS-Plainville there were 2 regular gamblers who reported that gambling had caused them to commit an illegal act and no one reported being arrested for committing a gambling-related crime. (It should be noted that PPC H&SC residents only constitute an estimated 11.4% of the patronage of PPC (Salame et al., 2017)).

²⁶ The increase in reports of lost property is due to an increase in visitors to the area misplacing their wallets, cell phones and ATM cards, while the increase in reports of suspicious activity is due to an increased number of visitors combined with a more vigilant local populace (Bruce, 2018).

²⁷ A z-score is the number of standard deviations from the mean a data point is. A z-score of 1.96 is equivalent to a *p* value of .05 (two-tail test).

Yet another source of data is the Uniform Crime Reporting statistics (FBI, 2018). Figure 17, Figure 18, and Figure 19 document the number of criminal offenses recorded by law enforcement in Plainville, Springfield, and Everett from 2010 to 2016.

Figure 17. Criminal Offenses Known to Law Enforcement in Plainville, 2010-2016

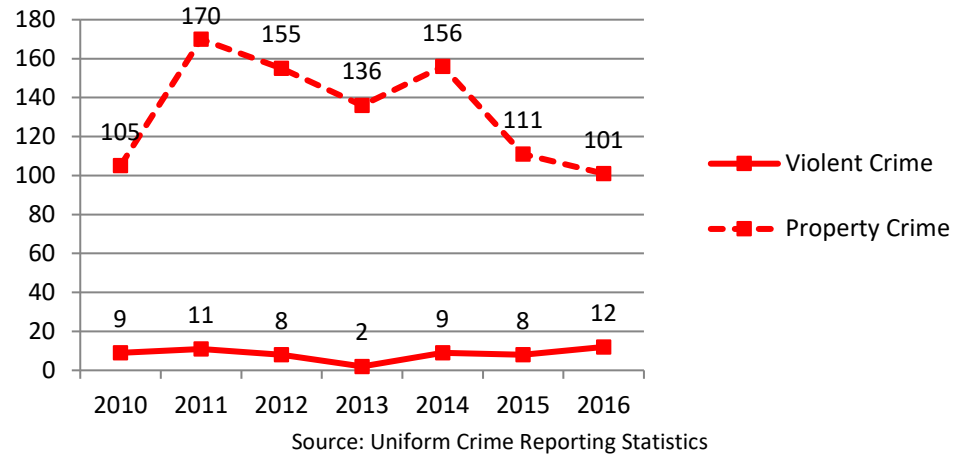


Figure 18. Criminal Offenses Known to Law Enforcement in Springfield, 2010-2016

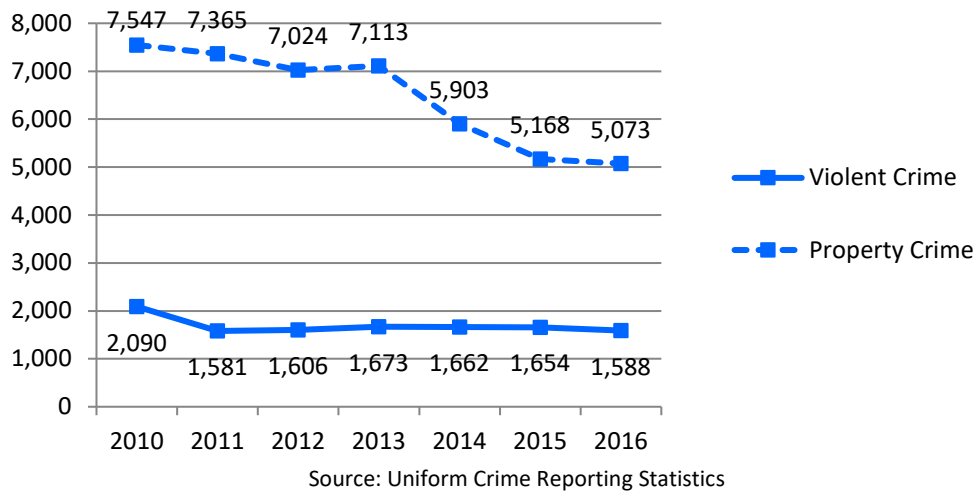
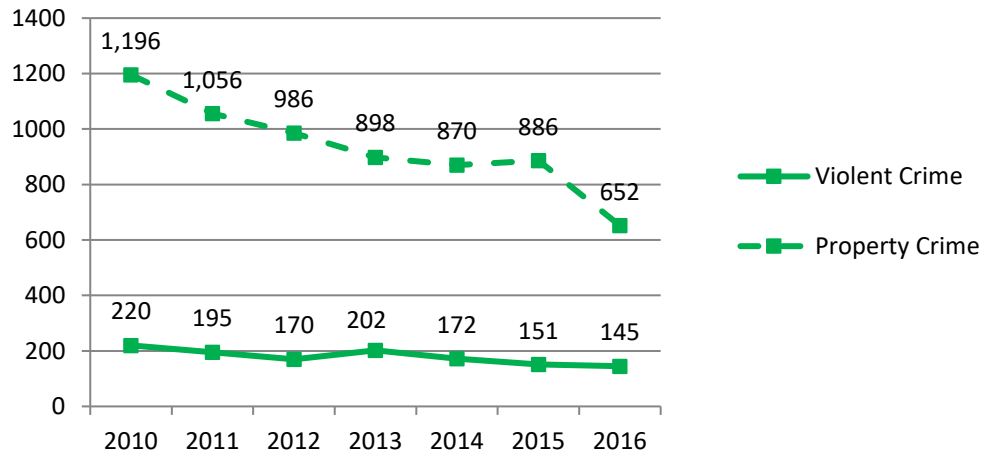


Figure 19. Criminal Offenses Known to Law Enforcement in Everett, 2010-2016



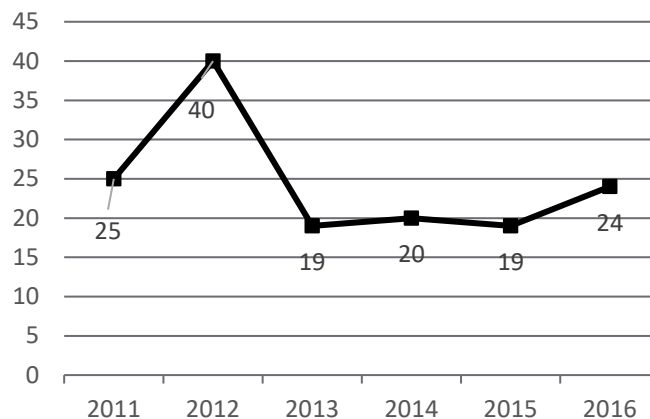
Source: Uniform Crime Reporting Statistics

Illegal Gambling

Statewide

Decreases in illegal gambling often occur with the introduction of legal forms. The four illegal gambling offenses in Massachusetts are ‘betting/wagering’, ‘operating/promoting/assisting gambling’, ‘gambling equipment violations’, and ‘sports tampering’. Figure 20 illustrates the total number of charges recorded by law enforcement in Massachusetts from 2011 to 2016 with the data being derived from the Uniform Crime Reporting statistics (FBI, 2018). As can be seen, the level of illegal gambling offenses was very low for several years prior to 2015, and even lower in more recent years.

Figure 20. Illegal Gambling Offenses in Massachusetts, 2011-2016



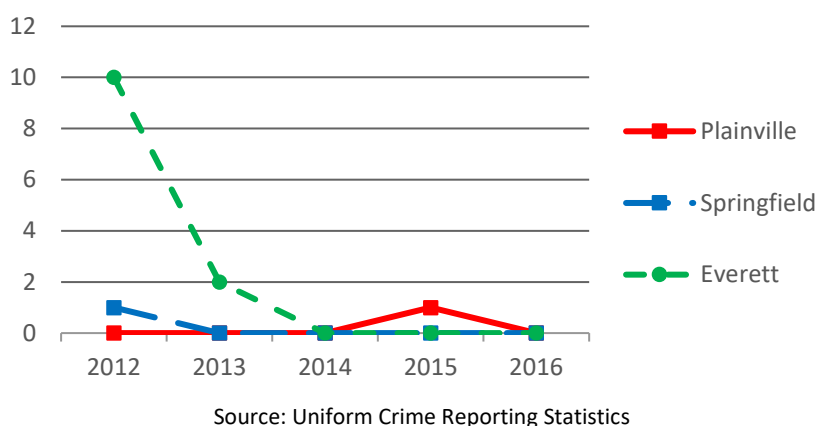
Source: Uniform Crime Reporting Statistics

In the MAGIC study, when restricting the analysis to members of the cohort who participated in both Waves 2 and 3, in Wave 2 in 2015 0.1% (0.0-0.4; 95% CI; $n = 1-4/1889$) reported that they had gambled at an 'underground' casino, slot parlor, or card room in Massachusetts in the past year compared to 0.2% (0.1-0.5; 95% CI; $n = 1-4/1889$) in Wave 3 in 2016. A McNemar test found no significant change ($p = .65$).

Regional

Figure 21 illustrates the number of illegal gambling offenses, in Plainville, Springfield, and Everett from 2012-2016. Here again, illegal gambling offenses are extremely uncommon with only 1 recorded offense in any of these communities from 2014-2016.

Figure 21. Illegal Gambling Offenses in Plainville, Springfield, and Everett, 2012-2016



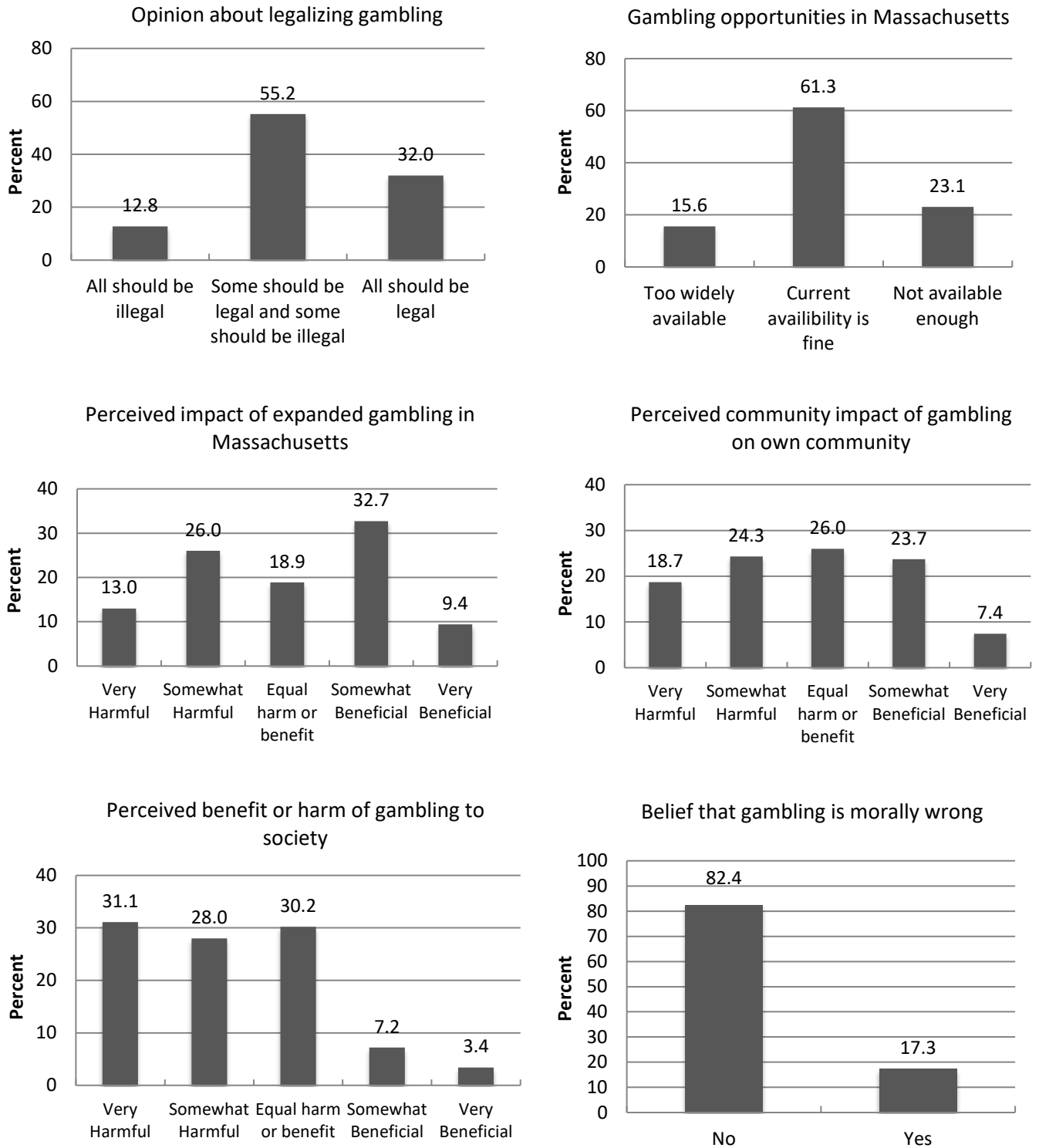
ATTITUDES

Statewide Impacts

Baseline Levels

Attitudes toward gambling in the general population were established in the BGPS (Volberg et al., 2017). As seen in Figure 22, the majority of Massachusetts residents at baseline believed that only some forms of gambling should be legal; that the current availability of gambling was fine; that gambling was more harmful than beneficial to society; and that gambling was not morally wrong.

Figure 22. Attitudes toward Gambling in Massachusetts in 2013/2014, Weighted



Source: Volberg et al. (2017)

Changes over Time in Relation to Casino Introduction

It is not possible to accurately measure statewide changes in attitudes until the Follow-up General Population Survey (FGPS) is conducted in 2020. It is possible to look at changes among the members of the MAGIC cohort who participated in both Waves 2 and 3 but it must be remembered that changes in the cohort do not substitute for actual statewide estimates. The following table illustrates changes in attitudes toward gambling in the MAGIC cohort when restricting the analysis to people who participated in both Wave 2 in 2015 and Wave 3 in 2016. Significant changes were observed in three of the four attitudes assessed (using a Wilcoxon test when there were more than two response categories and a McNemar test for attitudes when there were just two response categories).²⁸ More specifically, there were: fewer people who think all forms of gambling should be legal and a corresponding increase in the percentage who believe that certain types should be legal and certain types illegal; fewer people who think that gambling is not available enough, with a corresponding increase in the percentage who believe that the current availability is fine; and a decrease in the percentage of people who think that the benefits of gambling are equal to the harms, associated with a general trend toward more people believing that the harms outweigh the benefits. The large sample size facilitated statistically significant differences in some of these attitudes even when the magnitude of the change was fairly small.

Table 15. Attitudinal Changes within the MAGIC Cohort, 2015-2016

		Wave 2: 2015			Wave 3: 2016			p
		N	%	95% CI	N	%	95% CI	
Opinion about legalized gambling	All types of gambling should be illegal	152	6.3	(5.4 - 7.3)	132	5.5	(4.6 - 6.4)	<.0001
	Some types should be legal and some illegal	1,378	57.1	(55.1 - 59.0)	1,688	69.9	(68.0 - 71.7)	
	All types of gambling should be legal	885	36.6	(34.7 - 38.6)	595	24.6	(23.0 - 26.4)	
Beliefs about gambling opportunities in MA	Gambling is too widely available	326	13.6	(12.3 - 15.1)	371	15.5	(14.1 - 17.0)	<.0001
	The current availability of gambling is fine	1,356	56.8	(54.8 - 58.7)	1,468	61.4	(59.5 - 63.4)	
	Gambling is not available enough	707	29.6	(27.8 - 31.5)	550	23.0	(21.4 - 24.8)	
Perceived benefit or harm of gambling to society	Harm far outweighs the benefits	471	19.7	(18.1 - 21.3)	536	22.4	(20.8 - 24.1)	<.0001
	Harm somewhat outweighs benefits	694	29.0	(27.2 - 30.9)	729	30.5	(28.7 - 32.3)	
	Benefits are about equal to the harm	896	37.4	(35.5 - 39.4)	806	33.7	(31.8 - 35.6)	
	Benefits somewhat outweigh the harm	244	10.2	(9.0 - 11.5)	254	10.6	(9.4 - 11.9)	
	Benefits far outweigh the harm	88	3.7	(3.0 - 4.5)	68	2.8	(2.2 - 3.6)	
Belief that gambling is morally wrong	No	2,260	93.9	(92.2 - 94.3)	2,275	94.0	(92.9 - 94.9)	.155
	Yes	161	6.7	(5.7 - 7.7)	146	6.0	(5.1 - 7.1)	

N is the total number of respondents who answered the question.

²⁸ Note that only four attitudinal questions are asked of MAGIC participants compared to six questions for people in the BGPS and BTPS.

Regional Impacts

Baseline Levels

Baseline attitudes toward gambling in the MGM Springfield H&SC are presented below in Table 16. This data is from the BTPS – Springfield. These attitudes do not appear fundamentally different than observed in the state, albeit with perhaps a more positive attitude toward the potential benefits of casinos both for society and for one's own community.

Table 16. Baseline Attitudes toward Gambling in the MGM Springfield H&SC in 2015, Weighted

		BTPS-Springfield		
		N	%	95% CI
Opinion about legalized gambling	All types should be illegal	58,002	13.1	(10.4 - 16.4)
	Some should be legal and some illegal	249,086	56.2	(52.0 - 60.3)
	All types should be legal	136,479	30.8	(27.1 - 34.7)
Belief about gambling opportunities in MA	Gambling is too widely available	90,416	20.3	(17.1 - 23.9)
	Current availability of gambling is fine	255,390	57.3	(53.1 - 61.5)
	Gambling is not available enough	99,549	22.4	(18.9 - 26.2)
Perceived impact of new casinos to MA	Very harmful	69,994	15.5	(13.0 - 18.4)
	Somewhat harmful	105,150	23.3	(20.0 - 26.9)
	Neither beneficial nor harmful	76,020	16.8	(13.7 - 20.5)
	Somewhat beneficial	154,332	34.2	(30.3 - 38.2)
	Very beneficial	46,317	10.3	(7.8 - 13.3)
Perceived impact of new casino to your own community	Very harmful	67,466	15.2	(12.6 - 18.1)
	Somewhat harmful	94,846	21.3	(18.3 - 24.6)
	Neither beneficial nor harmful	101,489	22.8	(19.4 - 26.6)
	Somewhat beneficial	138,443	31.1	(27.3 - 35.1)
	Very beneficial	42,791	9.6	(7.3 - 12.6)
Perceived benefit or harm of gambling to society	Harm far outweighs the benefits	136,134	30.3	(26.6 - 34.2)
	Harm somewhat outweighs benefits	95,166	21.2	(18.3 - 24.4)
	Benefits are about equal to the harm	161,340	35.9	(31.9 - 40.1)
	Benefits somewhat outweigh the harm	37,565	8.4	(6.2 - 11.2)
	Benefits far outweigh the harm	19,001	4.2	(2.6 - 6.7)
Is gambling morally wrong	No	370,550	81.8	(78.0 - 85.1)
	Yes	81,941	18.1	(14.8 - 21.9)

N is the total number of respondents who answered the question weighted to the Springfield H&SC population

Changes over Time in Relation to Casino Introduction

Attitudes toward gambling in Plainville and surrounding communities roughly one year before the casino opened (BTPS-Plainville) compared to roughly over a year after it opened (FTPS-Plainville) are shown in Table 17. Statistical tests were employed to determine whether there were any significant changes in attitudes between the two time points (a Mann-Whitney U test²⁹ for questions with more than two response categories and a Chi-Square test for questions with just two response categories). As can be seen, some attitudes have changed with

²⁹ Also known as the Wilcoxon Rank Sum Test.

some of these changes paralleling the changes seen in the MAGIC cohort. More specifically, a) there is a significant decrease in the percentage of people who indicate that gambling is not available enough and a corresponding increase in the percentage of people who believe that the current availability of gambling is fine; b) there is a significant decrease in the percentage of people who believe that casinos will be beneficial to Massachusetts and a corresponding increase in the percentage of people who believe they will be neither beneficial or harmful; and c) there is an increase in the percentage of people who believe that the new casino in their community will be neither beneficial or harmful to their community.

Table 17. 2014 Baseline versus 2016/2017 Follow-Up Attitudes toward Gambling in the PPC H&SC, Weighted

		BTPS-Plainville			FTPS-Plainville			<i>p</i>
		N	%	95% CI	N	%	95% CI	
Opinion about legalized gambling	All types should be illegal	32,439	11.2	(8.7 - 14.4)	23,745	8.1	(6.2 - 10.6)	.415
	Some should be legal and some illegal	165,219	57.2	(53.0 - 61.4)	167,629	57.5	(53.0 - 61.8)	
	All types should be legal	91,060	31.5	(27.8 - 35.5)	100,281	34.4	(30.2 - 38.8)	
Belief about gambling opportunities in MA	Gambling is too widely available	43,213	14.9	(12.2 - 18.0)	43,563	14.8	(12.2 - 18.0)	<.0001
	Current availability of gambling is fine	175,868	60.5	(56.2 - 64.6)	216,166	73.7	(69.6 - 77.4)	
	Gambling is not available enough	71,552	24.6	(21.0 - 28.7)	33,625	11.5	(8.7 - 14.9)	
Perceived impact of new casinos to MA	Very harmful	24,256	8.3	(6.7 - 10.3)	26,169	8.8	(7.0 - 11.1)	.0001
	Somewhat harmful	74,086	25.4	(22.0 - 29.2)	76,248	25.8	(22.3 - 29.5)	
	Neither beneficial nor harmful	64,523	22.2	(18.7 - 26.1)	94,648	32.0	(27.9 - 36.4)	
	Somewhat beneficial	104,532	35.9	(31.9 - 40.1)	88,417	29.9	(25.9 - 34.2)	
	Very beneficial	23,851	8.2	(6.2 - 10.7)	10,382	3.5	(2.3 - 5.3)	
Perceived impact of new casino to your own community	Very harmful	36,620	12.5	(10.4 - 15.0)	35,978	12.1	(9.8 - 14.9)	.048
	Somewhat harmful	73,826	25.2	(21.6 - 29.2)	73,300	24.7	(21.4 - 28.3)	
	Neither beneficial nor harmful	73,539	25.1	(21.6 - 28.9)	105,243	35.4	(31.1 - 40.0)	
	Somewhat beneficial	85,024	29.0	(25.3 - 33.1)	69,383	23.4	(19.8 - 27.4)	
	Very beneficial	23,825	8.1	(6.1 - 10.8)	13,232	4.5	(3.0 - 6.5)	
Perceived benefit or harm of gambling to society	Harm far outweighs the benefits	75,744	26.2	(22.8 - 29.9)	71,849	24.6	(21.3 - 28.3)	.220
	Harm somewhat outweighs benefits	87,135	30.1	(26.2 - 34.3)	87,302	29.9	(26.2 - 33.9)	
	Benefits are about equal to the harm	92,197	31.9	(28.0 - 36.1)	106,677	36.5	(32.2 - 41.1)	
	Benefits somewhat outweigh the harm	22,417	7.8	(5.9 - 10.1)	19,099	6.5	(4.7 - 9.0)	
	Benefits far outweigh the harm	11,757	4.1	(2.8 - 5.8)	7,004	2.4	(1.3 - 4.4)	
Is gambling morally wrong	No	255,146	87.4	(84.0 - 90.2)	266,579	89.3	(86.2 - 91.8)	.457
	Yes	34,596	11.9	(9.3, 15.0)	31,881	10.7	(8.2 - 13.8)	

N is the total number of respondents who answered the question weighted to the PPC H&SC population. Note: Italics indicates relative standard error >30%

Three key informants from Plainville all expressed the opinion that the local populace had positive attitudes toward the new casino:

“Overwhelmingly, the people in Plainville are happy the casino is here.” Jennifer Thompson, Town Administrator, Plainville, MA, January 25, 2018, 10am-11am, phone interview.

“I would say that they [attitudes] have actually improved. In 2013, we were debating whether we were going to allow ourselves to become a host community and there was an awful lot of work involved in education, what it would mean.....This has been a good thing for the Town of Plainville, there will always be naysayers but we can refute them with stats and hard numbers.” Kathleen Parker, Treasurer of Plainville, MA, February 1, 2018, 11am-12pm, 2018, phone interview.

“I would have to say that everyone I have come across is pleased with the casino to this point. It has come through with all of the promises that were made.” Lou LeBlanc, Chairman of the Board of Health, Plainville, MA, March 1, 2018, 5pm-6pm, phone interview.

POPULATION HEALTH & LEISURE

Physical and Psychological Health

Statewide Impacts

It is very unlikely there would be any statewide changes in physical and psychological health or substance use/abuse as a result of the introduction of a single casino. Even if there was, the ability to attribute these changes to casino introduction is tenuous. Thus, the following information is presented primarily in the interests of context and comprehensiveness.

The following table illustrates the self-reported level of general health, happiness, and stress in the MAGIC study when restricting the analysis to members of the cohort who participated in both Wave 2 and Wave 3. Employing a Wilcoxon test, compared to 2015, in 2016 the overall level of happiness in the cohort was significantly lower as was overall level of stress. The magnitude of these changes is very small and statistical significance is achieved by virtue of the large sample size. Furthermore, it seems very unlikely that these changes are related to changes in gambling availability within the state.

A supplementary health-related question also established that 2.9% (2.2-3.8; 95% CI; $n = 47/1634$) of regular gamblers reported that gambling had caused health problems for them in the past year in Wave 2 compared to 3.5% (2.8-4.6; 95% CI; $n = 58/1634$) in Wave 3. A McNemar test found this change to be nonsignificant ($p = .15$). An additional supplementary question found that 3.7% (2.9-4.7; 95% CI; $60/1634$) of regular gamblers reported that gambling had caused them to have significant mental stress in the past year compared to a very similar level of 3.9% (3.9-4.9; 95% CI; $63/1634$) in Wave 3 in 2016. Here again, this change was nonsignificant ($p = .75$).

Table 18. Self-Reported Health, Happiness, and Stress in the MAGIC Cohort, 2015-2016

		Wave 2: 2015			Wave 3: 2016			<i>p</i>
		N	%	95% CI	N	%	95% CI	
General Health	Excellent	607	24.9	(23.2 - 26.6)	588	24.1	(22.4 - 25.8)	.323
	Very Good	1,001	41.0	(39.1 - 43.0)	1,030	42.2	(40.3 - 44.2)	
	Good	643	26.4	(24.6 - 28.1)	597	24.5	(22.8 - 26.2)	
	Fair	159	6.5	(5.6 - 7.6)	194	8.0	(6.9 - 9.1)	
	Poor	30	1.2	(0.9 - 1.8)	31	1.3	(0.9 - 1.8)	
Happiness	Very Low	12	0.5	(0.3 - 0.9)	17	0.7	(0.4 - 1.1)	<.0001
	Low	118	4.9	(4.1 - 5.8)	121	5.0	(4.2 - 5.9)	
	Moderate	1,023	42.3	(40.3 - 44.2)	1,105	45.6	(43.7 - 47.6)	
	High	1,036	42.8	(40.8 - 44.8)	986	40.7	(38.8 - 42.7)	
	Very High	232	9.6	(8.5 - 10.8)	192	7.9	(6.9 - 9.1)	
Stress	Very Low	109	4.5	(3.7 - 5.4)	114	4.7	(3.9 - 5.6)	<.0001
	Low	508	20.9	(19.3 - 22.5)	609	25.0	(23.3 - 26.8)	
	Moderate	1,176	48.3	(46.3 - 50.3)	1,171	48.1	(46.1 - 50.1)	
	High	488	20.0	(18.5 - 21.7)	432	17.7	(16.3 - 19.3)	
	Very High	154	6.3	(5.4 - 7.4)	109	4.5	(3.7 - 5.4)	

N is the total number of respondents in both Waves.

Regional Impacts

Table 19 shows the self-reported level of health, happiness, and stress in the Plainville Targeted Surveys from 2014 (Baseline) to 2016/2017 (Follow-Up). A Mann-Whitney U test found no significant changes. In addition, a supplementary question established that 4.7% (2.1-10.2; 95% CI; $n = 11/468$) of regular gamblers reported that gambling had caused health problems for them in the past year in 2014 compared to 2.6% (1.1-5.8; 95% CI; $n = 11/412$) in 2016/2017, which again, represents a nonsignificant change ($p = .34$).

Table 19. 2014 Baseline versus 2016/2017 Follow-Up Health, Happiness, and Stress in PPC H&SC, Weighted

		BTPS-Plainville			FTPS-Plainville			<i>p</i>
		N	%	95% CI	N	%	95% CI	
General Health	Excellent	67,405	23.0	(19.9 - 26.5)	62,472	20.8	(17.2 - 24.8)	.850
	Very Good	110,186	37.6	(33.6 - 41.8)	119,291	39.7	(35.6 - 43.9)	
	Good	82,222	28.1	(24.4 - 32.1)	97,913	32.6	(28.4 - 37.0)	
	Fair	27,146	9.3	(7.1 - 12.1)	16,757	5.6	(4.0 - 7.7)	
	Poor	6,092	2.1	(1.2 - 3.4)	4,249	1.4	(0.7 - 2.7)	
Happiness	Very Low	1,901	0.7	(0.3 - 1.5)	1,849	0.6	(0.3 - 1.5)	.876
	Low	12,660	4.3	(3.0 - 6.3)	21,515	7.2	(5.1 - 10.1)	
	Moderate	124,832	42.7	(38.6 - 46.9)	122,503	41.1	(36.9 - 45.4)	
	High	123,768	42.3	(38.2 - 46.6)	125,828	42.2	(37.9 - 46.6)	
	Very High	29,100	10.0	(7.8 - 12.6)	26,626	8.9	(6.7 - 11.8)	
Stress	Very Low	10,295	3.5	(2.1 - 5.8)	4,710	1.6	(1.0 - 2.5)	.624
	Low	48,128	16.4	(13.5 - 19.7)	42,903	14.3	(11.7 - 17.3)	
	Moderate	141,405	48.1	(44.0 - 52.3)	150,027	49.9	(45.5 - 54.3)	
	High	72,467	24.7	(21.2 - 28.6)	79,573	26.5	(22.7 - 30.6)	
	Very High	21,493	7.3	(5.6 - 9.5)	23,586	7.8	(5.8 - 10.5)	

Substance Use and Addictions

Statewide Impacts

Past 30-day alcohol consumption among Massachusetts adults is collected as part of the annual Behavioral Risk Factor Surveillance System (BRFSS) (2015) for the Centers for Disease Control and Prevention (CDC). Results from 2011 to 2016 are displayed below.

Table 20. Percentage of Massachusetts Adults Consuming Alcohol in Past 30 Days, 2011-2016

Year	Yes (%)	95% CI
2011	64.5	(63.4 - 65.7)
2012	63.9	(62.9 - 64.9)
2013	63.6	(62.4 - 64.9)
2014	61.9	(60.6 - 63.2)
2015	60.4	(58.9 - 61.8)
2016	62.1	(60.6 - 63.7)

Source: BRFSS

In the MAGIC study, when restricting the analysis to members of the cohort who participated in both Wave 2 and Wave 3, 0.3% (0.2-0.7; 95% CI; $n = 7/2083$) reported seeking help for their use of alcohol or drugs in the past 12 months in 2015 compared to 0.6% (0.4-1.1; 95% CI; $n = 13/2083$). This change was nonsignificant ($p = .11$). In addition, 8.4% of people (7.4-9.6; 95% CI; $n = 204/2423$) in 2015 reported having a behavioral addiction (overeating, sex, shopping, exercise, etc.) compared to a very similar percentage of 8.2% in 2016 (7.1-9.3; 95% CI; $n = 198/2423$). Here again, the change was nonsignificant ($p = .70$).

Regional Impacts

In the Plainville Targeted Surveys, a total of 0.2% of people in 2014 (0.0-0.7; 95% CI; $n = 1-4/1085$) reported seeking help for their use of alcohol or drugs in the past 12 months compared to 0.7% in 2016/2017 (0.2-2.1; 95% CI; $n = 6/1005$), which is a nonsignificant change ($p = .23$); and 7.1% of people (5.3-9.4; 95% CI; $n = 85/1081$) reported having a behavioral addiction (overeating, sex, shopping, exercise, etc.) in 2014 compared to a very similar percentage of 10.1% (7.5-13.4; 95% CI; $n = 83/1006$) in 2016/2017. Here again, the change is nonsignificant ($p = .10$).

Leisure Activity

Statewide Impacts

Gambling is a recreational activity enjoyed by a large segment of the population. Participation rates provide one indication of the value of this leisure activity. In the MAGIC study, when limiting the sample to participants who completed both waves and using non-parametric tests (McNemar and Wilcoxon), Table 21 shows there to be a small but statistically significant increase in the 84.5% past year gambling participation in Wave 2 in 2015 compared to the 86.4% in Wave 3. A similar small but statistically significant increase in number of gambling

formats engaged in was also observed. On the other hand, there was a significant decrease in aggregate gambling spending and no significant change in the frequency of gambling. (Note that changes in the participation rates for individual types of gambling are described later in a later section of this report, in *Impacts on Other Types of Gambling*. Note also that the statistical significance is not difficult to achieve with large sample sizes, although the practical significance of these small changes may be minor).

Table 21. Changes in Level of Gambling Involvement within the MAGIC Cohort, 2015-2016

	Wave 2: 2015			Wave 3: 2016			<i>p</i>
	<i>N</i>		95% CI	<i>N</i>		95% CI	
Any Past Year (PY) Gambling	2,444	84.5%	(83.0 - 85.9)	2,444	86.4%	(85.0 - 87.7)	.004
Mean PY number of gambling formats	2,444	2.6	(2.5 - 2.6)	2,444	2.7	(2.6 - 2.8)	<.0001
Median PY number of gambling formats	2,444	2.0	(1.8 - 2.1)	2,444	2.2	(2.1 - 2.3)	
Mean PY gambling expenditure	2,444	-\$3177	(-5,368, -984.5)	2,444	-\$1109	(-1,440, -777)	.006
Median PY gambling expenditure	2,444	-\$122.0	(-139.6, -104.4)	2,444	-\$100.9	(-122.2, -79.5)	
Mean PY maximum frequency of gambling	2,444	46.9 days	(43.9 - 50.0)	2,444	46.3 days	(43.2 - 49.3)	.073
Median PY maximum frequency of gambling	2,444	6.8 days	(5.9 - 7.6)	2,444	6.0 days	(5.9 - 6.1)	

Note: A negative sign for expenditure denotes a gambling loss.

A second way of gauging the importance of gambling as a leisure activity is by asking directly. In the MAGIC study, when restricting the analysis to members of the cohort who participated in both Wave 2 and Wave 3, the following table illustrates participants answer to the question “How important is gambling to you as a recreational activity”. Using a Wilcoxon test, no significant changes from 2015 to 2016 were found.

Table 22. Importance of Gambling as a Recreational Activity within the MAGIC Cohort, 2015-2016

	Wave 2: 2015			Wave 3: 2016			<i>p</i>
	<i>N</i>	%	95% CI	<i>N</i>	%	95% CI	
Not at all important	1,034	52.0	(49.8, 54.2)	998	50.2	(48.0, 52.3)	.100
Not very important	677	34.0	(32.0, 36.1)	698	35.1	(33.0, 37.2)	
Somewhat important	242	12.2	(10.8, 13.7)	262	13.2	(11.7, 14.7)	
Very important	37	1.9	(1.3, 2.6)	32	1.6	(1.1, 2.3)	

The American Time Use Survey (ATUS) administered by the U.S. Department of Labor (2018a) measures the amount of time people report spending on various activities, such as paid work, childcare, volunteering, and socializing. One of the subcategories assessed is ‘attended gambling establishment’. As seen in Table 23 the amount of time spent at gambling establishments changed very little from 2010 to 2016.

Table 23. Attendance at Gambling Establishment in American Time Use Survey, 2010-2016

	Average hours per day per adult	% attending a gambling establishment on an average day
2010	0.01	0.4
2011	0.01	0.3
2012	0.01	0.4
2013	0.01	0.3
2014	0.01	0.4
2015	0.00	0.2
2016	0.01	0.3

Source: American Time Use Survey

Regional Impacts

The Baseline to Follow-Up Targeted Population Survey of the PPC H&SC speaks to the potential regional impacts of the new PPC on gambling as a leisure activity. Table 24 illustrates no significant change in past year gambling participation, number of formats engaged in, overall gambling expenditure, or overall gambling frequency as assessed by Chi-Square and Mann-Whitney U tests.

Table 24. 2014 Baseline versus 2016/2017 Follow-Up Level of Gambling Involvement in the PPC H&SC, Weighted

	BTPS-Plainville			FTPS-Plainville			<i>p</i>
	N		95% CI	N		95% CI	
Any Past Year (PY) Gambling	234,793	79.8%	(76.2 - 83.0)	238,470	79.6%	(75.8 - 83.0)	.944
Mean PY number of gambling formats	294,722	2.1	(2.0, 2.3)	301,615	2.1	(2.0, 2.3)	.851
Median PY number of gambling formats	294,722	1.4	(1.2, 1.6)	301,615	1.4	(1.2, 1.6)	
Mean PY gambling expenditure	294,722	-\$821.1	(-2,616, 974)	301,615	-\$444.7	(-1,117, 228)	.767
Median PY gambling expenditure	294,722	-\$49.9	(-68.4, -31.4)	301,615	-\$41.6	(-60.7, -22.4)	
Mean PY maximum frequency of gambling	294,722	27.1 days	(21.5, 32.7)	301,615	27.6 days	(22.8, 32.4)	.923
Median PY maximum frequency of gambling	294,722	4.5 days	(4.3, 4.8)	301,615	4.3 days	(4.1, 4.6)	

Note: negative signs for expenditure denote a gambling loss. Weighted to the PPC H&SC population.

In addition, no significant changes were observed when asked directly about the importance of gambling as a leisure activity seen in the table below using a Mann-Whitney U test.

Table 25. 2014 Baseline versus 2016/2017 Follow-Up Importance of Gambling as a Recreational Activity in PPC H&SC, Weighted

	BTPS-Plainville			FTPS-Plainville			<i>p</i>
	N	%	95% CI	N	%	95% CI	
Not at all important	162,623	68.3	(63.7 - 72.6)	158,858	66.8	(61.9 - 71.4)	.778
Not very important	53,836	22.6	(19.0 - 26.6)	61,350	25.8	(21.7 - 30.4)	
Somewhat important	17,375	7.3	(4.8 - 10.9)	15,574	6.6	(4.2 - 10.0)	
Very important	4,307	1.8	(0.9 - 3.6)	Cell size ≤ 5			

Note: Italics indicates relative standard error >30%. Weighted to the PPC H&SC population.

Two key informants from Plainville noted that the casino has expanded the leisure options in the area:

"I think in terms of the casino itself and the entertainment, they have had some nice band and boxing events, so in terms of the residents, it is just another option for entertainment and dining." Jennifer Thompson, Town Administrator, Plainville, MA, January 25, 2018, 10am-11am, phone interview.

"It is a new venue close to home. ... The casino isn't just for gambling anymore. It has musical events, it has comedy events, it has boxing events. They also provide private parties....This is a smaller more intimate venue so you are going to have... you know something different." Kathleen Parker, Treasurer of Plainville, MA, February 1, 2018, 11-12pm, 2018, phone interview.

DEMOGRAPHICS

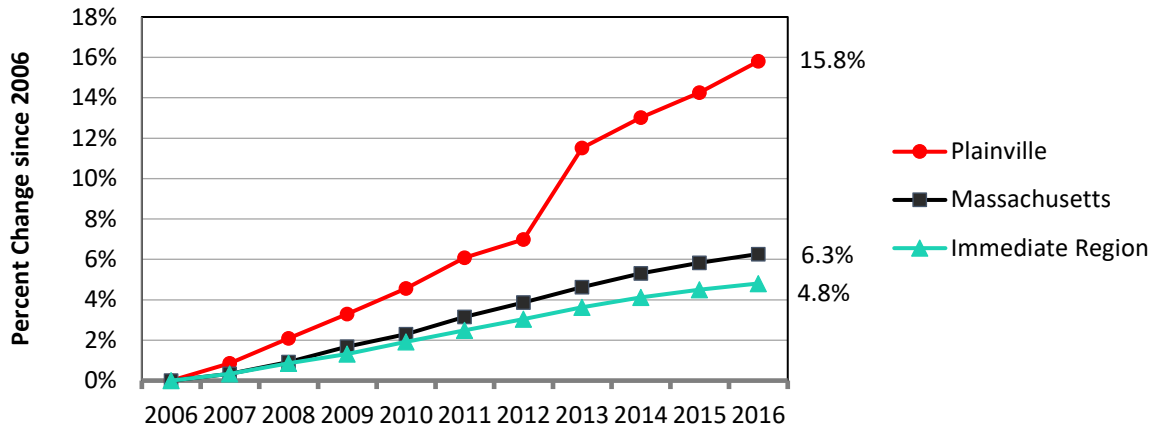
Large casinos can employ many workers. If these workers are brought in from other areas there is the potential to change the population and/or demographic make-up of the region. The focus in this section is on changes at a regional level, as it is implausible that statewide changes could occur.

Population

Regional Impacts

With a current population of 9,173, Plainville is a small town by the standards of Eastern Massachusetts, but it has experienced considerable growth in recent history. Data taken from the U.S. Census (2017) and displayed in Figure 23 shows how the population has changed since 2006 relative to the state and the surrounding region (Norfolk and Bristol Counties combined). The population of Plainville has grown by 15.8% percent from 2006 to 2016 (an increase of 1,252 residents); more than double the state's growth rate of 6.3% over the same period, and also a much faster rate than the immediate region (Norfolk and Bristol Counties) with 4.8% growth. However, as will be discussed in greater detail later in this report, it seems unlikely that PPC is a major factor in this population growth. Although there are approximately 500+ fulltime employees of this new facility, only 75 people reported moving to take their job, with only 13 of these individuals moving to Plainville (UMDI, 2017).

Figure 23. Population Increase in Plainville, Immediate Region, and Massachusetts, 2006-2016



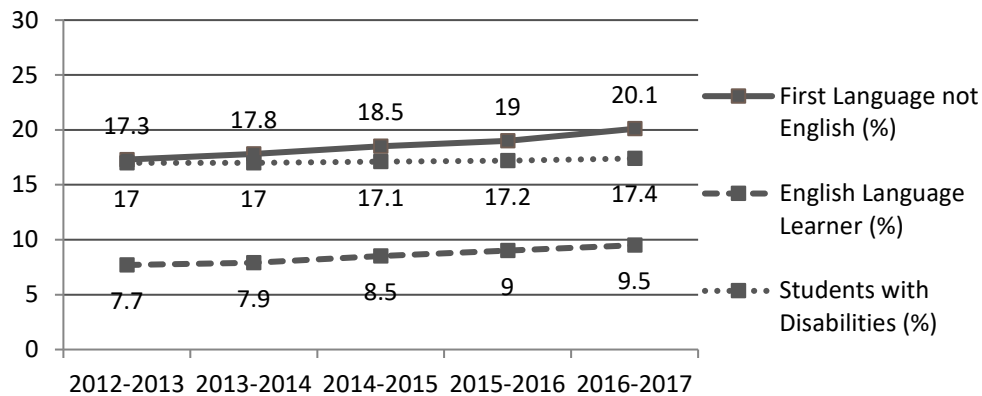
Source: U.S. Census

Educational System

Regional Impacts

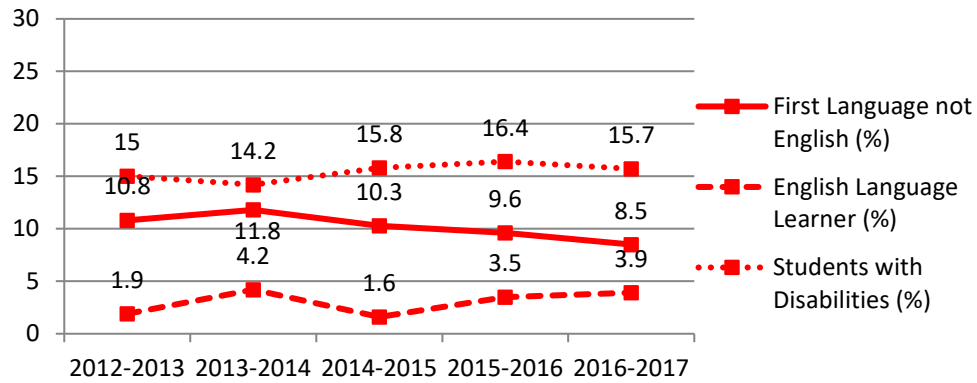
Educational impacts include changes in school enrollment, special needs/disability provision, and English language speakers/learners. Figure 24 illustrates changes from 2012/2013 to 2016/2017 in the percentage of students in Massachusetts public schools who a) do not have English as a first language, b) are an English language learner, and c) students with disabilities. The subsequent three figures illustrate the same trends for the municipalities of Plainville, Springfield, and Everett. This data is taken from the Massachusetts Department of Elementary and Secondary Education (2018). There is no evidence of any increases in these attributes of school attenders in Plainville, which is to be expected considering the small number of new employees of PPC who moved to Plainville. It will be instructive to observe changes in Springfield and Everett after those much larger casinos with much larger workforces are built and become operational.

Figure 24. % of Elementary and Secondary Students in Massachusetts with Certain Characteristics, 2012-2017



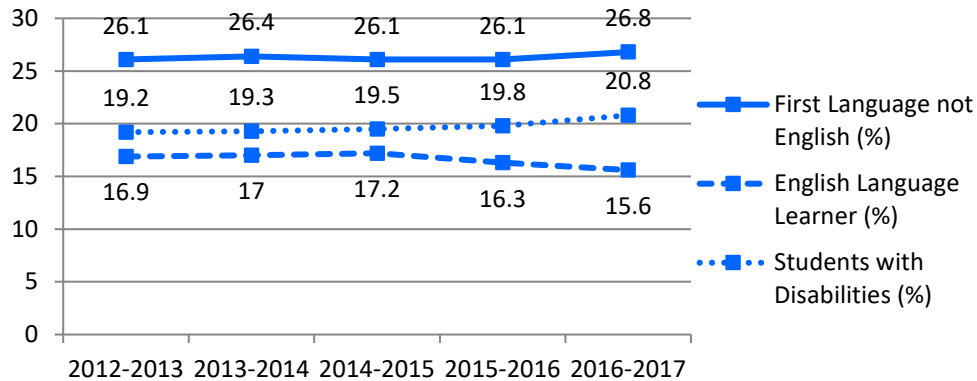
Source: MA Department of Elementary and Secondary Education

Figure 25. % of Elementary and Secondary Students in Plainville with Certain Characteristics, 2012-2017



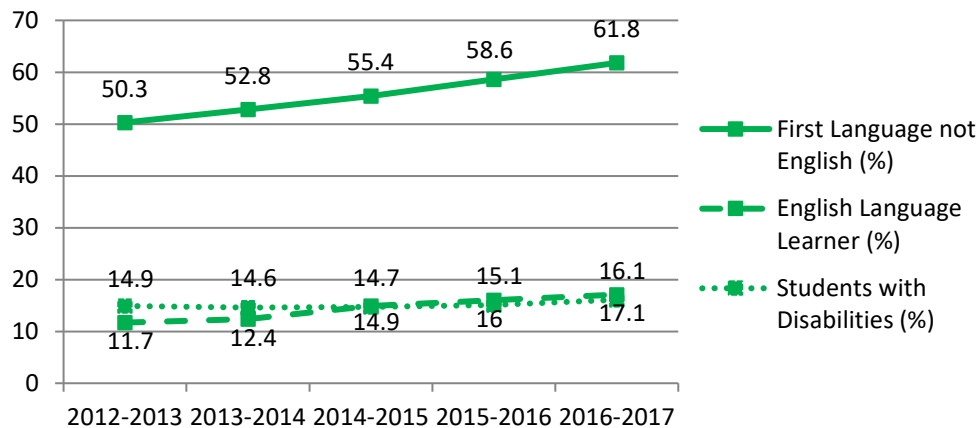
Source: MA Department of Elementary and Secondary Education

Figure 26. % of Elementary and Secondary Students in Springfield with Certain Characteristics, 2012-2017



Source: MA Department of Elementary and Secondary Education

Figure 27. % of Elementary and Secondary Students in Everett with Certain Characteristics, 2012-2017



Source: MA Department of Elementary and Secondary Education

Consistent with a lack of impact, one of the key informants from Plainville indicated the following:

“We haven’t seen an influx in the school system. So they have not received any direct impact from the casino.” Lou LeBlanc, Chairman of the Board of Health, Plainville, MA, March 1, 2018, 5-6pm, phone interview.

ENVIRONMENT

Traffic

Statewide Impacts

The Massachusetts Department of Transportation (2018a) has documented the number of vehicle crashes and injuries in Massachusetts from 2010 to 2015. These are derived from crash reports submitted by state and local police, other police departments, and operators. The data from 2013 to 2015 is reported in the table below.

Table 26. Vehicle Crashes and Injuries in Massachusetts, 2013-2015

Year	Crashes	Nonfatal Injuries	Fatal Injuries
2013	125,285	4,134	351
2014	130,233	4,027	354
2015	139,050	Not available	345

Source: MA Department of Transportation

The Fatality Analysis Reporting System (FARS) and the National Highway Traffic Safety Administration (NHTSA) (2018) have data for Massachusetts up to 2016 and is presented in the table below. Although there appears to be an increase in traffic fatalities from 2015 to 2016, this increase has no logical connection to the introduction of casinos, especially in light of the lack of regional impacts as seen in the next section.

Table 27. Traffic Fatalities in Massachusetts, 2013-2016

Year	Traffic Fatalities	Fatalities involving BAC .08+	% of Fatalities involving BAC .08+
2013	351	125	35.6%
2014	354	143	40.4%
2015	345	109	31.4%
2016	389	119	30.6%

Source: Fatality Analysis Reporting System & National Highway Traffic Safety Administration

Regional Impacts

The Massachusetts Department of Transportation (MassDOT) (2018a) has also specifically documented the number of vehicle crashes and injuries in the communities of Plainville, Springfield, and Everett. Data is presented from 2013 to 2015 in the table below. Grey shading in the next two tables indicates the construction period of the casinos in each community (PPC construction began April 2014; MGM in March 2015; Encore Boston Harbor in August 2016). As seen, there is no obvious association with casino construction for the time periods available.

Table 28. Vehicle Crashes and Injuries in Plainville, Springfield, and Everett, 2013-2015

Community	Year	Crashes	Nonfatal Injuries	Fatal Injuries
Plainville	2013	251	88	2
	2014	246	73	0
	2015	233	67	0
Springfield	2013	4,330	2,577	10
	2014	4,139	2,425	10
	2015	4,347	2,473	6
Everett	2013	380	177	1
	2014	415	224	1
	2015	420	181	2

Source: MA Department of Transportation

County level data from the Fatality Analysis Reporting System (FARS) and the National Highway Traffic Safety Administration (NHTSA) (2018) are available up to 2016 and presented in the table below. While traffic fatalities have increased slightly in association with casino construction and operation, attribution to the casino(s) is weak because of the 2016 increase in the state as a whole (Table 27), the lack of fatalities in the Town of Plainville (Table 29), and the fact that these fatalities are for the entire County.

Table 29. Traffic Fatalities in Norfolk, Hampden, and Middlesex Counties, 2013-2016

County	Year	Traffic Fatalities	% of Fatalities involving BAC .08+
Norfolk County (Plainville)	2013	28	42.9%
	2014	41	48.8%
	2015	38	31.6%
	2016	33	39.4%
Hampden County (Springfield)	2013	34	35.3%
	2014	34	58.8%
	2015	30	26.7%
	2016	40	37.5%
Middlesex County (Everett)	2013	41	29.3%
	2014	45	31.1%
	2015	48	35.4%
	2016	61	24.6%

Source: Fatality Analysis Reporting System & National Highway Traffic Safety Administration

Bruce's (2018) report of crime impacts in the PPC H&SC also includes police statistics on reported traffic collisions and complaints. The following table documents the average number of recorded incidents in the five years prior to PPC opening compared to the two years after. There does appear to be a significant increase in

annual traffic complaints that is likely attributable to the casino, which in turn, is likely attributable to an increased number of visitors to the area. This increase is more pronounced in the Town of Plainville compared to the PPC H&SC.

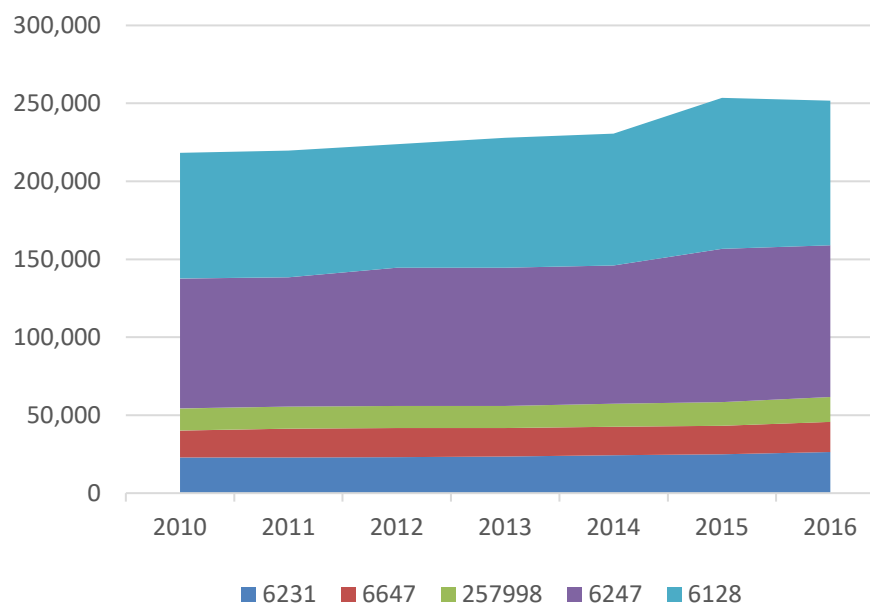
Table 30. Traffic Collisions and Complaints in PPC H&SC and Town of Plainville Recorded by Plainville Police

	2010 – 2015 Average	2016 – 2017 Average	% Change
Plainville			
Traffic Collision	312.0	329.0	5.4% increase
Traffic Complaint	234.8	329.5	40.3% increase
PPC H&SC			
Traffic Collision	4,583.2	4,975.0	8.5% increase
Traffic Complaint	1,692.4	1,946.5	15.0% increase

Source: Bruce (2018)

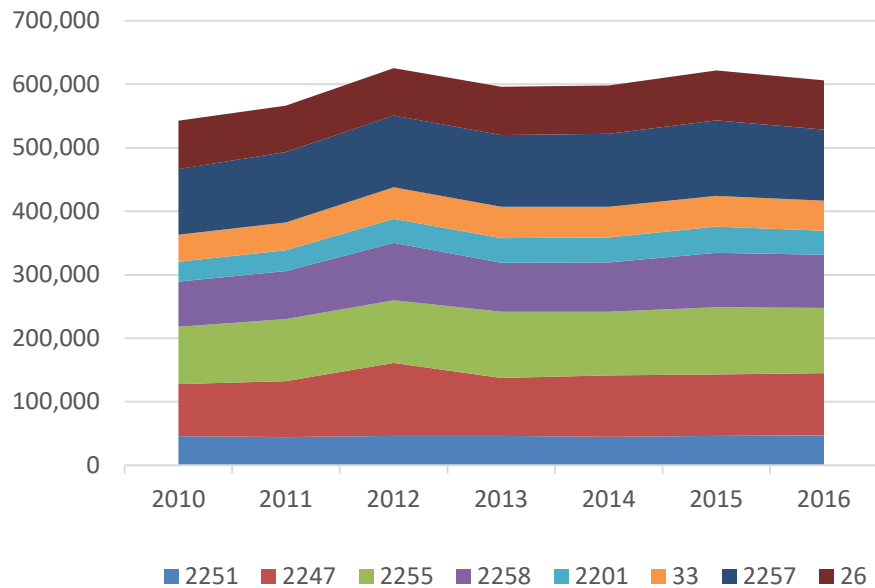
The final issue concerns traffic volume. The following three figures illustrate the annual two-way traffic volume for the traffic stations closest to the PPC in Plainville as well as the future casinos in Springfield and Everett. Traffic stations were chosen based on complete data being available from 2010 to 2016. Each color (and corresponding number) refers to a specific traffic counting station. As can be seen, Plainville experienced a 9.0% increase in traffic between 2014 and 2016. This compares to a 1.4% increase in Springfield between 2014 and 2016 and a 16.7% increase in Everett (MA Department of Transportation (MassDOT), 2018b).

Figure 28. Traffic Volume in Plainville at the 5 Closest Traffic Stations, 2010-2016



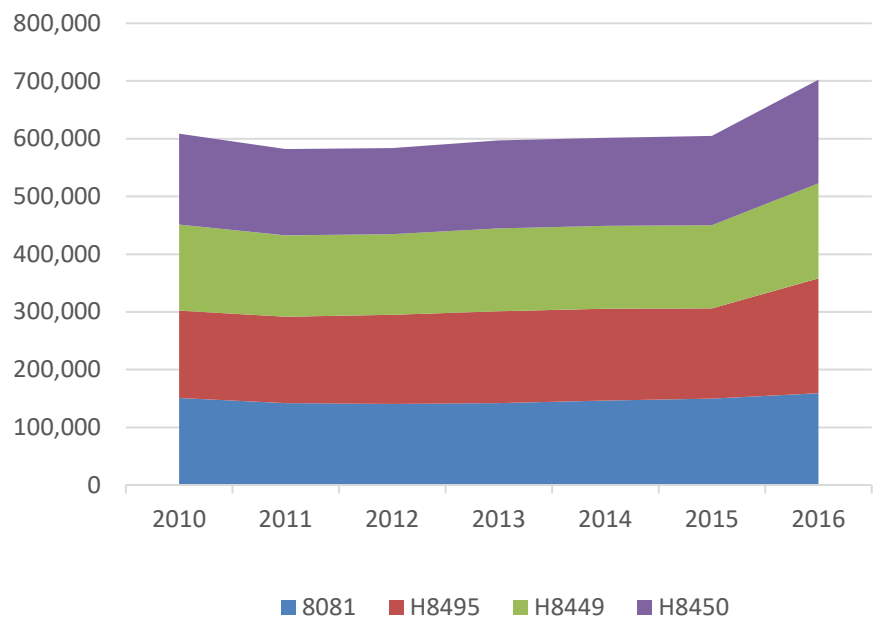
Source: MassDOT

Figure 29. Traffic Volume in Springfield at the 8 Closest Traffic Stations, 2010-2016



Source: MassDOT

Figure 30. Traffic Volume in Everett at the 4 Closest Traffic Stations, 2010-2016



Source: MassDOT

Three key informants from Plainville had the following comments about traffic:

"We have had virtually no issues in terms of traffic or congestion because of the casino. It actually runs better than it did before [laughs]. This was part of their application to the planning board...It is called

their 'site permit.' So it is separate from the host community agreement. It was part of their actual permit issued by the planning board to develop the property. Which is pretty standard for any large commercial business.....If anything traffic has improved as a result of improvements to the intersection." Jennifer Thompson, Town Administrator, Plainville, MA, January 25, 2018, 10am-11am, phone interview.

"Where the track and casino is located, it is the most dangerous intersection in town. But it was dangerous long before the casino got there....We actually lost a police officer in a road accident. He was killed by a driver while that intersection was being built. They have done a lot to make it safer." Kathleen Parker, Treasurer of Plainville, MA, February 1, 2018, 11-12pm, 2018, phone interview.

"Plainville is situated right at the corner of route one and 495 which are two major highways. So as far as traffic going through town, it is undetectable. Everyone is using the main thoroughfares to get in and out of there." Lou LeBlanc, Chairman of the Board of Health, Plainville, MA, March 1, 2018, 5-6pm, phone interview.

Noise

The only information pertaining to noise is the comment of a single key informant from the Plainville area:

"During construction the Board of Health received some complaints about the construction activity. There were dust complaints and there were noise complaints. We went out there with noise meters and took ambient noise levels and everything was found to be within tolerance and specs for a construction site. There were no violations issued.....We have received no noise complaints since construction has been completed." Lou LeBlanc, Chairman of the Board of Health, Plainville, MA, March 1, 2018, 5-6pm, phone interview.

ECONOMIC AND FISCAL IMPACTS

DIRECT CASINO EXPENDITURE AND REVENUE

As stated in the *Principles for Conducting Socioeconomic Impacts Analyses of Gambling* section, at a very elemental level casino gambling is an economic activity involving a transfer of wealth from certain groups and economic sectors to other groups and economic sectors, with most of the impacts being experienced in these specific groups and sectors. Thus, the present section is intended to facilitate understanding of the likely range and level of impacts by documenting the known expenditures and revenues of the three new casinos. More specifically:

- **Construction Expenditure:** The amount of money spent building the casino and identification of the groups and sectors that were the primary recipients of this spending.
- **Operating Revenue:** The amount of gambling and non-gambling revenue taken in by the casinos as well as identification of the groups and sectors that are the main contributors to this revenue.
- **Operating Expenditure:** The amount of money that is being expended to operate the casinos as well as identification of the groups and sectors that are the primary recipients of this spending.
- **Distribution of Net Profit:** The estimated portion of net casino profit that remains within Massachusetts.

Plainridge Park Casino

Construction Expenditure

As detailed in the paragraphs below, in total, \$150.2 million was spent building PPC, with 86.7% of this money being spent within Massachusetts.

All construction projects are preceded by site surveys, environmental assessments, and creation of building plans. In the case of PPC, these activities amounted to \$13.3 million shared between Ourway Realty, the prior owners of the site, and Penn National Gaming, the current owners. As seen in Table 31, virtually all of this money went to firms within Massachusetts, with the main regional beneficiaries being Metro Boston and Bristol and Norfolk Counties (Motamedi & Peake, 2017). The geographic regions referred to in this table (and used elsewhere in the Economic and Fiscal Impacts section) are displayed in Figure 31.³⁰

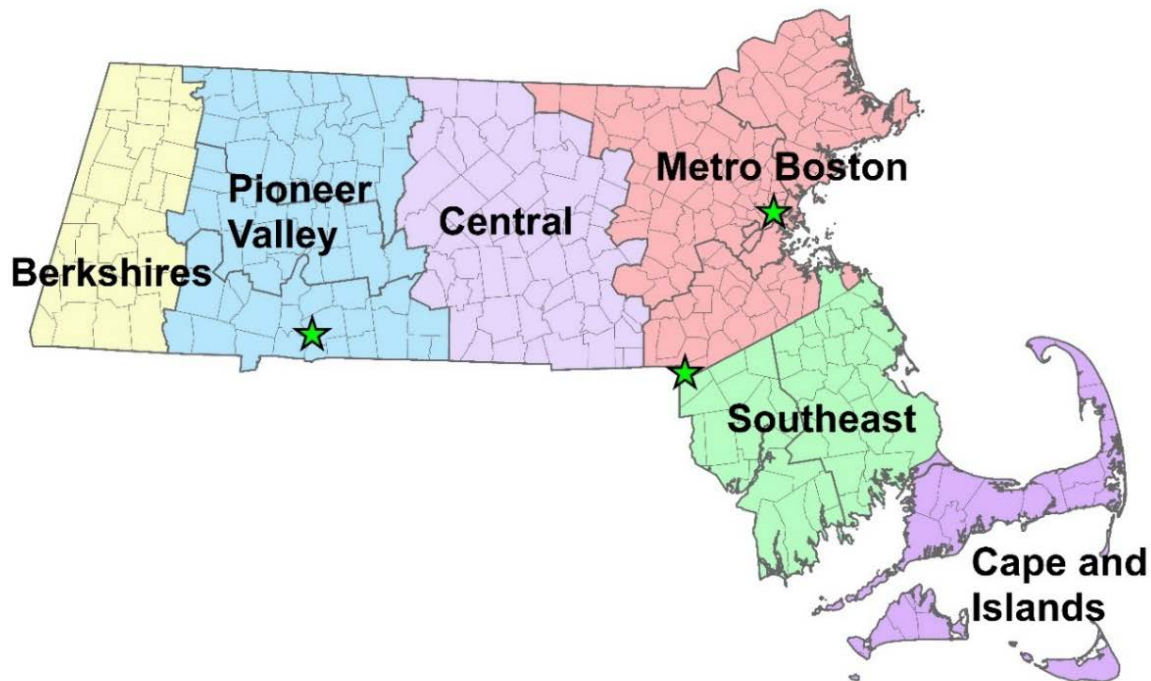
³⁰ These regions map unto the regions established by the Expanded Gaming Act, with the Berkshires and Pioneer Valley comprising Region A; Central and Metro Boston comprising Region B; and Southeast and Cape & Islands comprising Region C.

Table 31. Plainridge Park Casino Architecture, Engineering, and Design Spending by Region, 2010-2014

Region	2010	2011	2012	2013	2014	Total
Metro Boston	\$1,587,109	\$0	\$829,751	\$413,303	\$3,898,523	\$6,728,686
Bristol and Norfolk Counties	\$803,095	\$0	\$1,948,792	\$1,517,836	\$1,724,919	\$5,994,642
Rest of Southeastern MA	\$7,000	\$0	\$0	\$0	\$277,846	\$284,846
Lower Pioneer Valley	\$0	\$0	\$0	\$0	\$92,405	\$92,405
Rest of Western MA	\$74,940	\$0	\$0	\$0	\$0	\$74,940
Out-of-State	\$9,781	\$0	\$22,726	\$25,410	\$88,520	\$146,437
Total	\$2,481,925	\$0	\$2,801,269	\$1,956,549	\$6,082,213	\$13,321,956

Source: Pinck & Co. Note: nothing was spent in 2011.

Figure 31. Regions of Massachusetts used for Economic Modelling



An estimated \$115.4 million was then spent on building and renovating the physical structure of PPC (Motamedi & Peake, 2017). Construction activities comprised 79.6% of the total building budget, which includes things such as concrete, earthwork and site preparation, hanging drywall, and installing electrical, HVAC, and plumbing systems. Table 32 itemizes construction expenses by industry category as well as geographic origin of the spending. As seen, a total of 85.6% of all spending went to in-state suppliers. Within Massachusetts, almost two-thirds of the overall economic activity generated by the construction occurred in Bristol and Norfolk Counties, while a further one quarter occurred in Metro Boston (Motamedi & Peake, 2017). Neighboring states received less than 5% of the spending and most of the remaining 11% was spent on kitchen equipment from Florida and structural steel from Quebec, Canada. It should be noted that the some of this spending likely went to second level suppliers outside of Massachusetts. For example, although \$4.3 million of drywall was purchased from Massachusetts suppliers it is unknown where the drywall itself was manufactured.

Table 32. Total Plainridge Park Casino Construction Spending by Industry Group and State

Industry	Total	% Spent in MA
Construction	\$91,875,994	87%
Insurance and Bonds	\$15,098,255	100%
Manufacturing Goods	\$4,041,560	4%
Rental and Leasing	\$1,428,153	100%
Other	\$1,343,505	100%
Administration and Waste	\$879,412	100%
Wholesale	\$718,271	0%
Total	\$115,385,150	85.6%

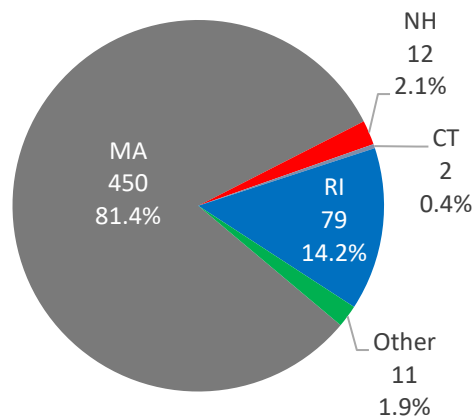
Source: Pinck & Co.

Construction Employment, Residency, and Wages

Plainridge Park Casino employed many tradesmen throughout its 14-month construction period (April 2014 - June 2015) (Motamedi & Peake, 2017). Total employment is estimated using counts of workers paid each quarter. These numbers are not full time equivalent annual jobs but rather the number of workers who were paid during a particular 3-month period, many of whom may have only been on-site for a few weeks or even days. Employment numbers started at 390 in the second and third quarters of 2014, increasing to 562, 627, and 634 in each of the following quarters. The cumulative total of employment across all quarters was 2,213, however, this involves some multiple counting of the same individuals. The average employment count across all quarters (554) may be a better reflection of the total full-time employment during the building's construction. The large majority of construction jobs went to employees in Bristol and Norfolk Counties.

Figure 32 shows the number of construction workers by state of residence. This figure illustrates that 81.4% of workers were from Massachusetts, with Rhode Island being the next largest group at 14.2%. The large majority of construction jobs went to employees in Bristol and Norfolk Counties.

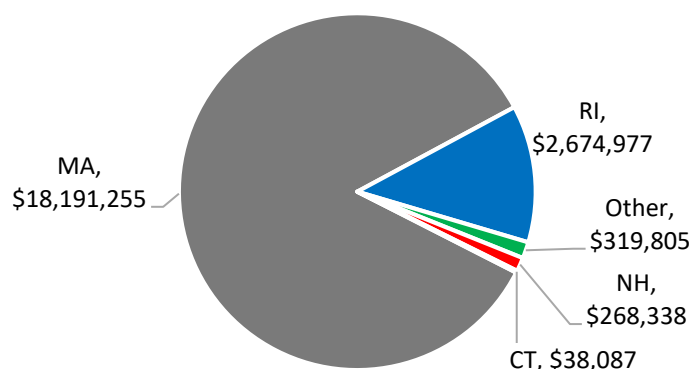
Figure 32. Number of Plainridge Park Casino Construction Workers by State of Residence and Share of Total



Source: Pinck & Co.

Unlike employment numbers, wages can be more appropriately summed over time to show cumulative dollars, which totaled \$21,492,462. The geographic distribution of wages is very similar to the geographic distribution of workers. As seen in Figure 33, the bulk of the wages paid (84.6%) went to Massachusetts residents, with 33% of this being paid to workers living in Bristol and Norfolk Counties (only 3% of all wages went to workers from the H&SC).

Figure 33. Total Plainridge Park Casino Construction Wages by State of Residence



Source: Pinck & Co.

Operating Revenue

On-Site Revenue

The following table documents revenue per calendar year within PPC as reported to the Massachusetts Gaming Commission and/or contained in Penn National's Annual Reports. Horse racing revenue is estimated by applying a 22% takeout rate on total handle. Revenue in calendar year 2015 was low due to a mid-year opening in June. Revenue in 2016 increased to nearly \$176 million. Total revenue for 2017 is estimated at approximately \$185.7 million, assuming horse racing, lottery, and non-gambling revenue are equivalent to 2016. Gambling accounted for approximately 95%+ of all revenue, and slot machines and electronic table games accounted for about 90% of all gambling revenue.

Table 33. Plainridge Park Casino Revenue, June 2015 to present

Calendar Year	Slot + Table Game Net Revenue	Horse Racing Net Revenue	Lottery Gross Sales ³¹	TOTAL Gambling Revenue	TOTAL Non-Gambling Revenue	TOTAL Revenue
2015	\$88,230,548	~\$9,500,000	\$1,058,325	~\$98,788,873	\$5,400,000 ³²	~\$104,118,873
2016	\$155,041,918	~\$11,500,000	\$2,951,191	~\$169,493,109	\$6,500,000 ³³	~\$175,993,109
2017	\$164,786,230	Not available	Not available	~\$179,000,000	Not available	~\$185,700,000

Source: MA Gaming Commission and Penn National Gaming Annual Reports

³¹ <http://massgaming.com/wp-content/uploads/Plainridge-Park-Casino-Quarterly-Report-2016-Q4.pdf>

³² [2015 Penn National Annual Report](#) p.61.

³³ [2016 Penn National Annual Report](#) p.54

Estimated Off-Site Revenue

In addition to spending at the casino, PPC patrons spent money in the immediate area during their visit to the casino. The 2016 PPC Patron Survey (Salame et al., 2017) established that 67.2% of patrons did not spend money or engage in any other off-site activities during their trip to PPC. Among those patrons who did report off-site activities, purchasing food and/or beverages in a restaurant or fast food outlet was the most common activity, followed by retail shopping (see Table 34). The total amount of off-site spending was estimated to be approximately \$4,046,878 in calendar year 2016.³⁴

Table 34. Non-Gambling Activities Off-Site by Plainridge Park Casino Patrons in 2016, Weighted

Off-Site Activities	% of Patrons
Nothing	67.2%
Bought food or beverage in a restaurant or fast food outlet	21.4%
Retail shopping at store or mall	11.2%
Spent money on other entertainment (e.g. amusement park, bowling, museum)	3.2%
Went to a live entertainment show, concert or performance	2.1%
Stayed at a hotel outside of the casino	1.6%

Source: Salame et al. (2017)

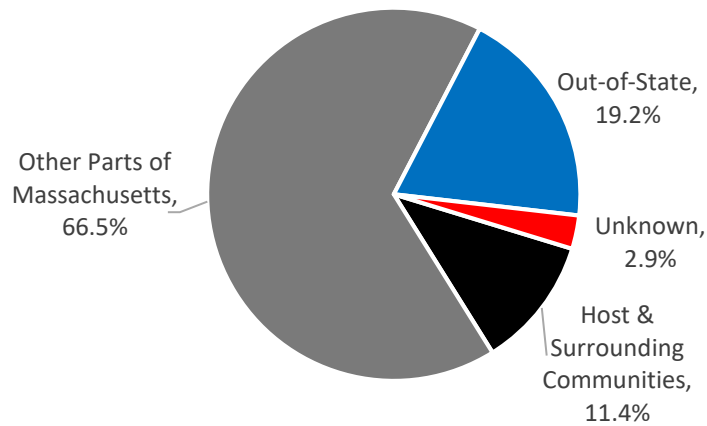
Revenue Origin

The geographic origin of patrons is a central determinant of the economic value of casino revenue. Revenue from local residents is often a reallocation of money from other local economic sectors. Revenue from more distant within-state residents may represent an influx of money to the local area, but potentially at the expense of other areas within the state. On the other hand, revenue from out-of-state patrons represents new money to the Massachusetts economy as does the situation where a Massachusetts patron has spent money at a Massachusetts casino that they would have otherwise spent at an out-of-state casino ('recaptured revenue').

Figure 34 illustrates the geographic origin of PPC patrons as established by the 2016 Patron Survey (Salame et al., 2017). What this figure shows is that the large majority of patrons (66.5%) are Massachusetts residents from outside the PPC H&SC. The second largest group (19.2%) are out-of-state patrons. Patrons from the PPC H&SC comprise the smallest group at 11.4%.

³⁴ Some caution is warranted with the PPC Patron Survey results due to a response rate of only 22.4% (which was subsequently weighted to the estimated population of PPC patrons).

Figure 34. Geographic Origin of Plainridge Park Casino Patrons in 2016, Weighted



Source: Salame et al. (2017)

The relative proportion of patrons from different geographic areas is not necessarily equivalent to their relative financial contribution. Expenditure questions in the PPC Patron Survey allowed us to estimate that Massachusetts residents accounted for approximately 78.6% of all gambling revenue at PPC, 92.1% of non-gambling revenue at PPC, and 78.9% of non-gambling revenue outside of PPC (i.e., in the geographic area of the casino). This is estimated to represent \$134 million, \$6 million, and \$3 million respectively. Collectively, Massachusetts residents are estimated to account for 79.1% of all gambling and non-gambling revenue and non-Massachusetts residents account for 20.9% of all gambling and non-gambling revenue (Salame et al., 2017).

The PPC Patron Survey asked Massachusetts patrons whether they would have gambled at an out-of-state casino that day if PPC had not existed.³⁵ A total of 69.8% of all patrons (and 58.7% of all patrons from PPC H&SC) reported they would have spent their money gambling in another state if there was not a casino in Massachusetts, with Connecticut (74.3%) and Rhode Island (68.1%) being the primary locations where they would have gone. Assuming the answers to this hypothetical question are reasonably accurate and that this redirection of casino patronage would continue throughout the year, then this 'recaptured spending' is estimated to represent the largest single source of revenue at PPC (\$100 million in Fiscal Year 2016 as shown in Table 35).

People who indicated they would *not* have spent their money gambling at an out-of-state casino were asked what they would have spent their money on instead. A total of 79.7% indicated they would have spent their money on other things, with the most commonly reported items being restaurants and bars, followed by lottery tickets, retail items, and various housing and household items. This is known as 'reallocated revenue' and is estimated to represent the second largest share of overall revenue at PPC (\$36.6 million in Fiscal Year 2016 as shown in Table 35).

³⁵ Out-of-state casino patronage is common among Plainridge Park Casino patrons, with nearly 90% of patrons indicating they had visited casinos in other jurisdictions in the previous year with Connecticut (72.3%) and Rhode Island (55.9%) being the most common locations.

Table 35. Estimated Sources of Revenue at Plainridge Park Casino from Patron Survey, Fiscal 2016

Source of Revenue	Estimated Revenue (Millions of Dollars)	Share of Revenue
Recaptured Spending by In-State Patrons	\$100.0	58.0%
Reallocated Spending by In-State Patrons	\$36.6	21.2%
Spending by Out-of-State Patrons	\$36.0	20.8%
Total	\$172.6	100.0%

Source: Peake & Motamedi (2017)

Consistent with the PPC Patron Survey finding a fairly substantial monetary ‘recapture’ of dollars previously being spent out-of-state on gambling, the MAGIC study also found a significant decrease in reported past year out-of-state casino patronage from Wave 2 in 2015 to Wave 3 in 2016. When weighted to the Massachusetts population, this represented a change from 26.6% of the population patronizing out-of-state casinos in 2015 (23.9-29.4; 95% CI), decreasing to 18.6% in 2016 (16.0-21.5; 95% CI). When restricting the analysis to participants who completed both waves, this represented a decrease from 31.8% in 2015 (30.0-33.8; 95% CI) to 21.9% in 2016 (20.3-23.7; 95% CI) ($p < .0001$; McNemar test). This information is presented in Table 49 where changes over time in relation to the introduction of casino gambling are discussed.³⁶

However, two other sources of evidence are somewhat inconsistent with the foregoing evidence of substantial monetary recapture. For one, as seen in Table 36, the Baseline to Follow-Up Targeted Population Survey of the PPC H&SC found no significant change in the 23.2% past-year prevalence of out-of-state casino visitation in 2014 compared to the 28.3% reported in 2016/2017 (there was actually a nonsignificant trend toward an increase). Furthermore, there was also no significant change in overall past-year self-reported frequency of out-of-state casino visitation or past-year out-of-state casino expenditure, although there was a significant decrease in out-of-state non-gambling expenditure (i.e., food, lodging, entertainment). Note that outliers have a major impact on the means, which is why the medians are also presented and why non-parametric statistical tests were utilized (i.e., Chi-Square and Mann-Whitney U).

Table 36. Out-of-State Casino Patronage in 2014 BTPS-Plainville versus 2016/2017 FTPS-Plainville, Weighted

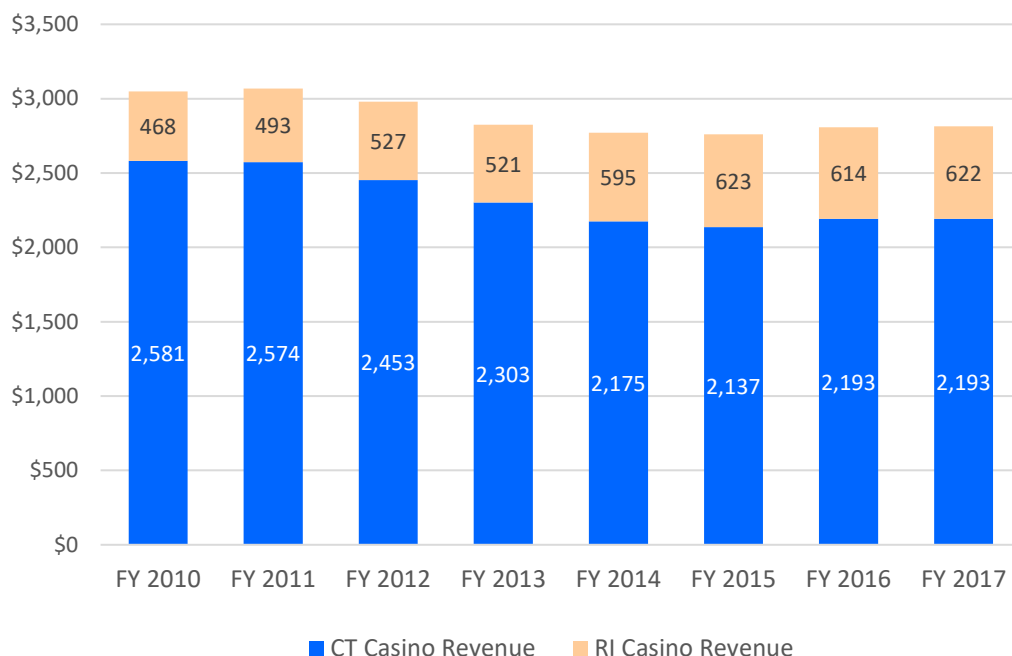
	BTPS-Plainville	FTPS-Plainville	<i>p</i>
Past Year (PY) Patronage of Out-of-State Casino + 95% CI	23.2% (20.0 – 26.9)	28.3% (24.3 – 32.6)	.070
Mean PY Number of Visits + 95% CI	1.3 (0.9 - 1.7)	1.3 (0.8 - 1.9)	.655
Mean PY Gambling Expenditure + 95% CI	+\$149.1 (-474.3 - 772.4)	-\$395.9 (-793.2 - 1.5)	.379
Median PY Gambling Expenditure + 95% CI	-\$3.1 (-20.0 - 13.8)	-\$0.6 (-28.3 - 27.0)	
Mean PY Non-Gambling Expenditure + 95% CI	\$234.9 (110.7 - 359.1)	\$80.6 (51.1 - 110.1)	<.0001
Median PY Non-Gambling Expenditure + 95% CI	\$39.8 (28.5 - 51.2)	\$0.0 (-11.8 - 11.8)	

Note: positive value for gambling expenditure denotes a net win, whereas negative values denote a net loss. Italics indicate relative standard error >30%. Mean and median gambling expenditure at out-of-state casinos are reported for the entire sample (including people who did not patronize out-of-state casinos), whereas out-of-state non-gambling expenditure is only reported for people who indicated they patronized out-of-state casinos as there may have been people who did not gamble at an out-of-state casino but did attend out-of-state casinos for other types of entertainment. Weighted to the PPC H&SC population.

³⁶ The MAGIC Wave 3 questionnaire was expanded to include more detailed questions on gambling expenditure for each type of gambling (e.g, EGMs, casino table games), which precludes a direct comparison of reported expenditure amounts for out-of-state casinos in Wave 2 versus Wave 3.

Also somewhat problematic is the fact that the combined net casino revenue in Connecticut and Rhode Island *increased* slightly in fiscal years 2016 and 2017 relative to 2015 as seen in Figure 35 (although there was a slight decrease in Rhode Island casino revenue in 2016). These same trends were identified in an independent analysis of this issue conducted by Christiansen Capital Advisors (2017). Historically, a significant portion of casino revenue in Rhode Island and Connecticut has derived from Massachusetts. For the two casinos in Rhode Island in 2015 it is estimated that Massachusetts residents contributed 51.9% of Twin River Casino revenue and 44.1% of the Newport Grand Casino revenue. For the two casinos in Connecticut in 2015, it is estimated that Massachusetts residents contributed 32.2% of Foxwoods Casino revenue and 18.3% of the Mohegan Sun revenue (Pyramid Associates, 2015).

Figure 35. Net Casino Revenue in Connecticut and Rhode Island, FY2010-FY2017, millions



Sources: Rhode Island Lottery (2018), Security Exchange Commission filings of the Mohegan Sun Gaming Authority (Mohegan Sun, 2018), Mashantucket Pequot Gaming Enterprise Annual Report (2016), and the Connecticut Department of Consumer Protection (CT Dept CP, 2018).

However, it quite possible that all of this data is correct and no inconsistencies actually exist. Out-of-state casino patronage in the PPC H&SC may not have changed (unlike the rest of MA) due to the fact the PPC H&SC region has the closest proximity in Massachusetts to the major Rhode Island and Connecticut casinos. Second, stronger national economic conditions, including an improving economy in Connecticut (CT) and Rhode Island (RI), may have increased patronage from CT and RI residents, making up the shortfall from decreased Massachusetts visitation.³⁷

³⁷ To shed further light on this issue, in February 2019 the SEIGMA team is planning to replicate the license plate survey methodology historically used by Pyramid Associates for the CT and RI casinos to ascertain whether there has been a genuine decrease in the percentage of Massachusetts plates at these venues.

Operating Expenditures

As detailed below, in total, \$129.5 million in operational expenses were incurred in PPC's first year of operation, with 87.0% of this money being spent within Massachusetts (Peake & Motamedi, 2017).

The largest operating expenditure is the 49% state tax on gross gaming revenue (GGR) from the slot machines and electronic table games.³⁸ The following table outlines these amounts for each fiscal year (MGC, 2018). Note that FY2016 includes the period June 24-30, 2015.

Table 37. State Taxes on Plainridge Park Casino's Gross Gaming Revenue by Fiscal Year

Fiscal Year	GGR Taxes
FY2016	\$81,362,999
FY2017	\$77,551,325
FY2018	\$83,307,913

Source: Massachusetts Gaming Commission

In addition to the GGR tax, PPC has payments to various vendors, employee wages, and regular business taxes. In its first year of operation PPC paid \$30.3 million to a large array of third parties. As seen in Table 38, payments to private sector vendors accounted for 61.3% of this spending, with payments to government entities accounting for nearly all of the rest (Peake & Motamedi, 2017). Of the payments made to government entities, the Commonwealth of Massachusetts is the largest beneficiary, with various local governments within Massachusetts accounting for the second largest share of spending.

Table 38. Operational Payments Made by Plainridge Park Casino, FY2016

Type of Payment	Amount	Share
Payments to Private Sector Vendors	\$18,606,043	61.3%
Payments to Government Entities	\$11,203,767	36.9%
Massachusetts State Government Entities	\$5,888,037	19.4%
Local Government Entities	\$4,371,035	14.4%
Federal Government Entities	\$921,451	3.0%
Other State Government Entities	\$23,245	0.1%
Payments to Unions and Other Membership Organizations	\$400,644	1.3%
Payments to Charitable Organizations	\$74,910	0.2%
Payments to Individuals	\$58,927	0.2%
Total	\$30,344,292	100.0%

Source: Plainridge Park Casino

Table 39 shows the top 10 private non-farm industry sectors receiving payments from PPC. The largest single industry was wholesale trade. This is somewhat intuitive since a firm as large as PPC would purchase almost all of its food, alcohol, cleaning supplies, uniforms, printed materials, etc. from wholesalers. The second largest

³⁸ This 49% is mandated for the slot parlor, whereas a 25% GGR tax is imposed on the two casinos.

industry, denoted as miscellaneous manufacturing, is primarily payments to the manufacturers of slot machines and other gambling equipment.

Table 39. Top 10 Industries by Vendor Spending

Industry	Amount	Share
Wholesale trade	\$5,622,313	18.5%
Miscellaneous manufacturing	\$2,950,975	9.7%
Utilities	\$2,125,119	7.0%
Professional, scientific, and technical services	\$1,795,481	5.9%
Retail trade	\$765,392	2.5%
Performing arts and spectator sports	\$634,976	2.1%
Administrative and support services	\$616,625	2.0%
Membership associations and organizations	\$480,069	1.6%
Broadcasting, except Internet	\$473,781	1.6%
Motion picture and sound recording industries	\$406,972	1.3%
All other Industries	\$14,472,590	47.7%
Total	\$30,344,292	100.0%

Source: Plainridge Park Casino

As shown in Table 40, the Metro Boston region of Massachusetts (which includes the Norfolk County) was the largest beneficiary of PPC's spending in its first fiscal year of operation, although in part, this is a result of large payments made to state government entities located in Boston, as well as payments to the Town of Plainville, which is located on the periphery of the region. Excluding payments to government entities, PPC spent more on goods and services from outside of Massachusetts than inside Massachusetts.

Table 40. Plainridge Park Casino Operation Spending by Region

Region	Amount	Share
Metro Boston	\$14,187,421	46.8%
Southeast Massachusetts	\$4,482,510	14.8%
Central Massachusetts	\$298,855	1.0%
Pioneer Valley	\$124,808	0.4%
Cape and Islands	\$80,822	0.3%
Rest of Nation / World	\$11,169,878	36.8%
Total	\$30,344,292	100.0%

Source: Plainridge Park Casino

Operations Employment and Wages

Aggregated data from Plainridge Park Casino provides information on employees hired by the casino and wages paid. The details are reported in UMDI (2017). Plainridge Park Casino hired 893 people in its first year of operation, with 573 (64.2%) of these being full-time employees. Many of these hires were to replace employees who left during the year. From July 2015 to June 2016 the total number of people employed at PPC each month varied from 570 to 512, with 512 people employed being the number in June 2016. Slightly fewer than half of these employees are gaming employees, and slightly more than half are service employees.

Table 41 shows the geographic origin of PPC’s hires, as well as the hours worked and wages paid. While Plainville and PPC are in the far southwestern corner of the Metro Boston region, the majority of hires were from the Southeast region and from out-of-state. This is not surprising, as the adjacent parts of both the Southeast Region and next-door Rhode Island are more densely populated than the suburban communities of western Norfolk County, where Plainville is located.

Table 41. Plainridge Park Casino Hires, Hours Worked, and Wages Paid by Region, First Year of Operation

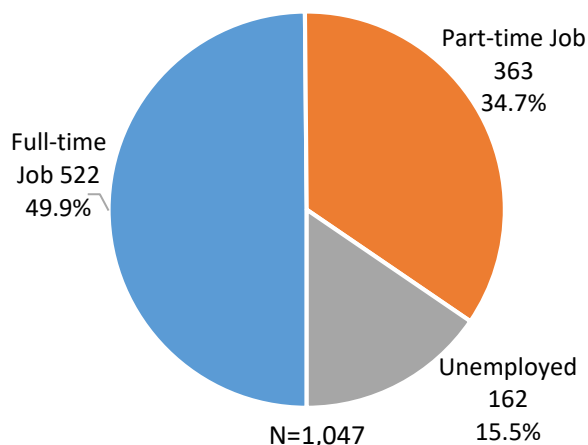
Region	Hires	% of Hires	Hours Worked	Wages Paid	% of Total Wages
Southeast Massachusetts	364	40.8%	401,127	\$6,229,344	35.0%
Out-of-State	256	28.7%	292,428	\$5,640,544	31.7%
Metro Boston	229	25.6%	254,019	\$5,089,465	28.6%
Central Massachusetts	40	4.5%	42,003	\$740,097	4.2%
Rest of Massachusetts	4	0.4%	5,372	\$109,246	0.6%
Total	893	100%	994,949	\$17,808,697	100%

Source: Plainridge Park Casino

A survey of new casino employees was administered to gather a range of information on their work-related characteristics and aspirations (UMDI, 2017). Survey results showed that 92.8% ($n = 972$) of new employees did not move or plan to move to take their new job. Of the 75 ‘movers,’ 26.7% ($n = 20$) relocated from other regions in Massachusetts, while 72.0% ($n = 54$) came from out-of-state. A total of 17.3% ($n = 13$) of the movers relocated to Plainville, with the rest moving to other surrounding communities (46.6%) or Rhode Island (30.7%).

Importantly, many of these jobs are ‘new’ jobs. As seen in Figure 36, 50.2% of respondents indicated they were either unemployed or employed part-time prior to taking their positions at PPC. The remaining 49.9% of new employees were previously employed full-time. Only 9.3% of people who were previously unemployed had previous experience working at a gambling establishment ($n = 15$). Less than 6% of previously unemployed respondents moved in order to take their positions at PPC ($n = 9$).

Figure 36. Work Status Prior to Being Hired at Plainridge Park Casino



Source: PPC New Employee Survey (UMDI, 2017)

Distribution of Net Profit

PPC is owned and operated by Penn National Gaming that has corporate headquarters in Pennsylvania. As of May 2018, this company operates 28 other gambling facilities in 16 U.S. states and 1 Canadian province: California, Florida, Illinois, Indiana, Kansas, Maine, Massachusetts, Mississippi, Missouri, Nevada, New Jersey, New Mexico, Ohio, Pennsylvania, Texas, West Virginia, and Ontario.

The amount of net profit for Penn National Gaming and the percentage of this net profit that stays in Massachusetts has not been determined. However, even if none of this money stays within the state, it constitutes the minority of the overall revenue and it is clear from the above data that PPC has resulted in a significant economic gain for the State of Massachusetts.

MGM Springfield

Construction Expenditure

The construction of MGM Springfield has also had positive economic impacts as MGM Resorts International spent a considerable amount of money in the State of Massachusetts building this facility and employing a large local workforce in the construction. However, the precise economic impacts are not currently available and will be detailed in future reports.

Operating Revenue

For future reports.

Operating Expenditure

For future reports.

Distribution of Net Profit

For future reports.

MGM Springfield is owned by MGM Resorts International with corporate headquarters in Las Vegas, Nevada. This is a hospitality and entertainment company with several destination casino resorts in Las Vegas (Bellagio, Circus Circus, CityCenter, Excalibur, Luxor, Mandalay Bay, MGM Grand, Mirage, Monte Carlo, New York-New York), as well as venues in Mississippi, Maryland, New Jersey, and Michigan. It also has part ownership in six Chinese-based resorts under the umbrella of MGM China and Diaoyutai MGM Hospitality – China.

Encore Boston Harbor

Construction Expenditure

The construction of Encore Boston Harbor Casino is also having positive economic impacts as the operator is currently spending a considerable amount of money in the state of Massachusetts building these facilities and employing a large local workforce in the construction. However, the precise economic impacts are not currently available and will be detailed in future reports.

Operating Revenue

For future reports.

Operating Expenditures

For future reports.

Distribution of Net Profit

For future reports.

Encore Boston Harbor is currently owned and operated by [Wynn Resorts](#) with corporate headquarters in Las Vegas. Wynn Resorts owns two other destination casino resorts in Las Vegas (Wynn Las Vegas, Encore at Wynn Las Vegas) and three destination casino resorts in Macau (Wynn Macau Resort, Encore at Wynn Macau, Wynn Palace).

BUSINESS ESTABLISHMENTS

This section and those that follow focus on more indirect global changes in the number and type of business establishments, employment, income, real estate, and government revenue and expenditure in the state and at a regional level that could potentially be related to the introduction of casino gambling to Massachusetts.

Number of Business Establishments

The focus in this section is on regional impacts, are there is no theoretical reason to currently expect statewide changes in the number of businesses as a result of casino introduction.

Regional Impacts

Table 42 shows the number of business establishments in Plainville, Norfolk County, Springfield, Hampden County, Everett, Middlesex County, and Massachusetts from 2010 to 2016 as taken from the Massachusetts Office of Labor and Workforce Development (OLWD) (2018), Labor Market Information, ES-202. Shaded cells

denote the years that construction and/or operation has been taking place for each facility (i.e., construction began April 2014 for PPC; March 2015 for MGM Springfield; and August 2016 for Encore Boston Harbor). The last column illustrates the percent change in the number of businesses during the construction/operation phase relative to the two prior years. For comparison purposes, a percentage change for Massachusetts for the same time periods for each region is also provided.

The data shows that Springfield, Hampden County, and Everett are the only areas where the number of business establishments have increased at a greater rate than the state as a whole.

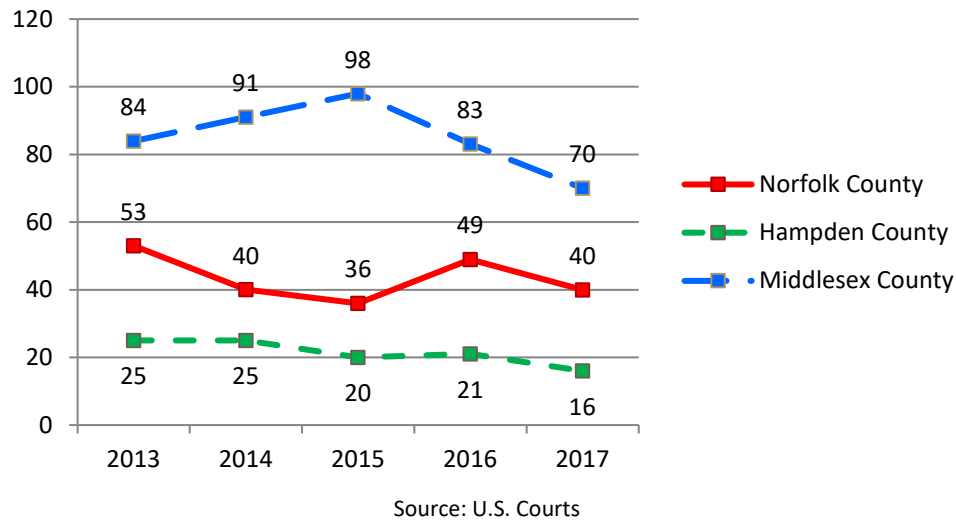
Table 42. Number of Businesses, 2010-2016

	2010	2011	2012	2013	2014	2015	2016	% increase
Plainville	341	344	351	356	364	371	372	4.4%
Norfolk County	24,321	23,961	23,310	23,410	24,134	24,700	25,237	5.7%
Massachusetts	220,134	227,844	223,467	226,350	231,749	237,928	246,651	6.6%
Springfield	5,957	5,919	6,063	6,483	6,861	7,223	7,548	10.7%
Hampden County	15,177	15,237	15,359	15,987	16,684	17,390	18,159	8.8%
Massachusetts	220,134	227,844	223,467	226,350	231,749	237,928	246,651	5.8%
Everett	805	841	834	848	888	936	985	8.0%
Middlesex County	48,979	50,185	49,198	49,574	51,852	53,281	54,465	3.6%
Massachusetts	220,134	227,844	223,467	226,350	231,749	237,928	246,651	5.0%

Source: OLWD, ES-202

A new casino not only has the potential for spawning new complementary businesses, but also for redirecting revenue from existing businesses and contributing to their demise. As reported earlier, an estimated 21.2% of PPC's annual revenue may be 'reallocated' from other economic sectors within the state. A potential marker of this is the number of business bankruptcy filings per year. Figure 37 shows these numbers for calendar years 2013 to 2017 for Norfolk County (where Plainridge Casino is located), Hampden County (where MGM Springfield is located), and Middlesex County (where Encore Boston Harbor is being built) as recorded by [U.S. Courts \(2018\)](#). Considering the very tiny fraction of all businesses in each county that these numbers represent and the natural year-to-year variation in business bankruptcies, there are no obvious trends in this data that can be attributed to the new casinos.

Figure 37. Business Bankruptcy Filings per Year in Selected Massachusetts Counties, 2013-2016



Impacts on Other Industry Sectors

The focus is on regional changes as there is no theoretical reason to currently expect a change in industry mix at the state level attributable to the introduction of casino gambling.

Regional

The year by year changes in the number of businesses as a function of industry sector provides information on whether PPC has potentially augmented or negatively impacted certain types of businesses.³⁹ This is shown for the Town of Plainville in Table 43 and the County of Norfolk in Table 44. Table 45 and Table 46 show the same data for Springfield and Hampden County and Table 47 and Table 48 show the data for Everett and Middlesex County. In all cases what is displayed is the number of businesses in each of the main North American Industry Classification Sectors (NAICS) from 2010 to 2016, along with a special focus on subsectors in the entertainment, accommodations, and food services that are often impacted by the introduction of destination casinos (Williams, Rehm, & Stevens, 2011). Shaded columns denote the years that construction and/or operation has been taking place for each facility.

The only notable changes in **Plainville** are the increases in the sectors of real estate and health care and social assistance. The increase in the health care and social assistance sector is likely reflective of statewide increases in this sector, as the increases occur in all six tables. The real estate increase may be influenced by the new casino, but probably has more to do with the significant population increase in this community (Figure 23).

Norfolk County had notable increases in health care and social assistance; museums, historical sites & related; mining, quarrying, oil and gas extraction; agriculture, forestry, fishing, hunting; education services; performing arts, spectator sports & related; transportation and warehousing; utilities; public administration; and information. Some of these changes seem logically unrelated to the introduction of PPC (e.g., mining,

³⁹ Revenue changes in each of these sectors is potentially even more relevant, but county-level data (from the [Economic Census](#)) only comes out every 5 years, with the last available data being from 2012, and the 2017 data not being available until later in 2018.

agriculture), while other changes are reflective of statewide increases (e.g., health care) and perhaps the slight increase in population (Figure 23). That being said, Norfolk County was one of the prime economic beneficiaries of PPC, so increases in some of these sectors may be related.

The only notable changes in **Springfield** are the increases in utilities; amusement, gambling & recreation; health care and social assistance; and transportation and warehousing. **Hampden County** also experienced an increase in health care and social assistance. Some of the Springfield increases are plausibly related to the construction of MGM Springfield.

The largest changes in **Everett** are the increases in health care and social assistance; construction; and transportation and warehousing. **Middlesex County** experienced the largest increases in health care and social assistance, and utilities. Here again, some of these increases are plausibly related to the construction of Encore Boston Harbor, but the ability to assign a causal attribution is weak.

Table 43. Number of Businesses by Industry Sector in Plainville, 2010-2016

Industry Group	2010	2011	2012	2013	2014	2015	2016	% change
Agriculture, Forestry, Fishing, Hunting (11)	NA	NA	NA	NA	NA	NA	NA	NA
Mining, Quarrying, Oil and Gas Extraction (21)	NA	NA	NA	NA	NA	NA	NA	NA
Utilities (22)	NA	NA	NA	NA	NA	NA	NA	NA
Construction (23)	54	51	47	47	47	48	55	6.4%
Manufacturing (31-33)	21	24	24	19	19	21	19	-8.5%
Wholesale Trade (42)	14	16	18	18	18	18	18	0.0%
Retail Trade (44-45)	33	32	31	32	33	33	32	3.7%
Transportation and Warehousing (48-49)	8	8	6	5	NA	5	6	0.0%
Information (51)	4	4	3	3	3	3	3	0.0%
Finance and Insurance (52)	19	20	25	26	27	25	23	-2.0%
Real Estate and Rental and Leasing (53)	7	7	7	11	12	16	19	74.1%
Professional and Technical Services (54)	33	40	42	41	42	42	39	-1.2%
Administrative and Waste Services (56)	31	31	31	31	30	30	28	-5.4%
Education Services (61)	NA	7	7	8	9	8	7	6.7%
Health Care and Social Assistance (62)	30	30	29	42	43	44	44	23.0%
Arts, Entertainment, and Recreation (71)	7	NA	NA	NA	NA	NA	NA	NA
Performing Arts, Spectator Sports & Related (711)	NA	NA	NA	NA	NA	NA	NA	NA
Museums, Historical Sites & Related (712)	NA	NA	NA	NA	NA	NA	NA	NA
Amusement, Gambling & Recreation (713)	5	5	6	NA	8	NA	NA	NA
Accommodations and Food Services (72)	33	33	33	32	33	34	33	2.6%
Accommodation (721)	NA	NA	NA	NA	NA	NA	NA	NA
Food Services & Drinking Places (722)	31	31	32	32	33	33	32	2.1%
Other Services, excluding Public Admin (81)	34	28	33	25	25	24	26	-13.8%
Public Administration (92)	NA	NA	NA	NA	NA	NA	NA	NA

Source: OLWD, ES-202. Note: NA indicates the data has been suppressed (often because the numbers are too low, which might identify a particular employer).

Table 44. Number of Businesses by Industry Sector in Norfolk County, 2010-2016

Industry Group	2010	2011	2012	2013	2014	2015	2016	% change
Agriculture, Forestry, Fishing, Hunting (11)	32	31	33	35	39	38	43	17.6%
Mining, Quarrying, Oil and Gas Extraction (21)	8	8	7	8	9	9	10	24.4%
Utilities (22)	24	24	24	23	28	24	27	12.1%
Construction (23)	2,267	2,280	2,072	2,035	2,125	2,188	2,259	6.7%
Manufacturing (31-33)	697	696	685	667	657	645	636	-4.4%
Wholesale Trade (42)	1,435	1,449	1,341	1,301	1,341	1,365	1,362	2.6%
Retail Trade (44-45)	2,493	2,499	2,435	2,446	2,506	2,504	2,511	2.7%
Transportation and Warehousing (48-49)	404	402	389	384	406	450	462	13.7%
Information (51)	437	444	431	428	466	473	478	10.0%
Finance and Insurance (52)	1,159	1,155	1,145	1,158	1,175	1,201	1,223	4.2%
Real Estate and Rental and Leasing (53)	754	773	741	754	773	819	850	8.9%
Professional and Technical Services (54)	3,003	3,166	3,009	3,031	3,170	3,265	3,344	7.9%
Administrative and Waste Services (56)	1,177	1,199	1,215	1,242	1,286	1,290	1,310	5.4%
Education Services (61)	399	413	406	431	469	493	497	16.2%
Health Care and Social Assistance (62)	2,060	2,081	2,085	4,585	4,651	4,784	5,025	44.5%
Arts, Entertainment, and Recreation (71)	343	354	351	357	376	386	383	7.8%
Performing Arts, Spectator Sports & Related (711)	68	71	76	77	89	91	84	15.0%
Museums, Historical Sites & Related (712)	12	11	11	12	14	15	15	27.5%
Amusement, Gambling & Recreation (713)	263	272	264	268	273	280	284	4.9%
Accommodations and Food Services (72)	1,469	1,513	1,481	1,511	1,535	1,568	1,580	4.3%
Accommodation (721)	72	72	69	70	70	77	77	7.4%
Food Services & Drinking Places (722)	1,397	1,441	1,412	1,441	1,465	1,491	1,503	4.2%
Other Services, excluding Public Admin (81)	5,778	5,084	5,067	2,568	2,660	2,737	2,759	-28.8%
Public Administration (92)	253	252	248	289	293	286	307	10.0%

Source: OLWD, ES-202. Note: NA indicates the data has been suppressed (often because the numbers are too low, which might identify a particular employer).

Table 45. Number of Businesses by Industry Sector in Springfield, 2010-2016

Industry Group	2010	2011	2012	2013	2014	2015	2016	% change
Agriculture, Forestry, Fishing, Hunting (11)	NA	NA	NA	NA	NA	NA	NA	NA
Mining, Quarrying, Oil and Gas Extraction (21)	NA	NA	NA	NA	NA	NA	NA	NA
Utilities (22)	4	4	5	5	5	6	7	30.0%
Construction (23)	156	166	155	154	160	160	146	-2.5%
Manufacturing (31-33)	112	103	94	93	93	91	92	-1.6%
Wholesale Trade (42)	125	125	118	118	120	122	122	2.5%
Retail Trade (44-45)	440	459	461	455	463	454	452	-1.3%
Transportation and Warehousing (48-49)	74	77	73	75	75	80	89	12.7%
Information (51)	47	53	50	51	54	52	59	5.7%
Finance and Insurance (52)	161	154	140	132	133	132	129	-1.5%
Real Estate and Rental and Leasing (53)	121	122	123	122	127	127	132	4.0%
Professional and Technical Services (54)	342	343	325	312	317	317	294	-2.9%
Administrative and Waste Services (56)	138	147	143	143	148	142	140	-3.1%
Education Services (61)	52	54	56	57	62	59	64	3.4%
Health Care and Social Assistance (62)	422	427	426	4,011	4,351	4,734	5,070	17.2%
Arts, Entertainment, and Recreation (71)	39	42	36	35	34	36	38	7.2%
Performing Arts, Spectator Sports & Related (711)	14	14	13	14	13	13	14	0.0%
Museums, Historical Sites & Related (712)	9	9	10	10	10	10	10	0.0%
Amusement, Gambling & Recreation (713)	16	19	13	11	11	13	14	22.7%
Accommodations and Food Services (72)	279	285	260	269	276	279	268	0.4%
Accommodation (721)	8	7	7	7	8	8	8	6.7%
Food Services & Drinking Places (722)	271	278	253	262	268	271	260	0.2%
Other Services, excluding Public Admin (81)	3,340	3,250	3,493	321	318	305	309	-3.9%
Public Administration (92)	79	79	77	102	96	100	107	4.5%

Source: OLWD, ES-202. Note: NA indicates the data has been suppressed (often because the numbers are too low, which might identify a particular employer).

Table 46. Number of Businesses by Industry Sector in Hampden County, 2010-2016

Industry Group	2010	2011	2012	2013	2014	2015	2016	% change
Agriculture, Forestry, Fishing, Hunting (11)	37	37	37	38	39	39	39	1.3%
Mining, Quarrying, Oil and Gas Extraction (21)	10	9	9	7	7	7	7	0.0%
Utilities (22)	28	29	30	34	35	34	36	1.4%
Construction (23)	1,019	1,034	990	969	999	1,004	1,013	2.5%
Manufacturing (31-33)	642	628	593	574	569	566	574	-0.3%
Wholesale Trade (42)	544	540	502	490	510	501	499	0.0%
Retail Trade (44-45)	1,542	1,574	1,535	1,541	1,544	1,538	1,565	0.6%
Transportation and Warehousing (48-49)	268	276	258	280	290	297	323	8.8%
Information (51)	129	138	136	135	140	141	155	7.6%
Finance and Insurance (52)	526	519	491	480	482	482	483	0.3%
Real Estate and Rental and Leasing (53)	375	386	375	369	385	381	389	2.1%
Professional and Technical Services (54)	908	931	889	868	906	934	896	3.2%
Administrative and Waste Services (56)	556	564	573	581	594	611	606	3.6%
Education Services (61)	194	210	213	220	231	227	241	3.8%
Health Care and Social Assistance (62)	1,057	1,079	1,079	7,001	7,523	8,216	8,884	17.7%
Arts, Entertainment, and Recreation (71)	161	167	155	148	155	152	156	1.7%
Performing Arts, Spectator Sports & Related (711)	36	37	34	30	29	25	30	-6.8%
Museums, Historical Sites & Related (712)	12	12	13	13	14	14	14	3.7%
Amusement, Gambling & Recreation (713)	113	118	108	105	112	113	112	3.7%
Accommodations and Food Services (72)	916	945	902	910	929	925	911	-0.2%
Accommodation (721)	60	59	60	62	62	65	61	1.6%
Food Services & Drinking Places (722)	856	886	842	848	867	860	850	-0.3%
Other Services, excluding Public Admin (81)	5,976	5,879	6,302	1,011	1,026	1,011	1,039	0.6%
Public Administration (92)	224	224	220	263	254	258	277	3.5%

Source: OLWD, ES-202. Note: NA indicates the data has been suppressed (often because the numbers are too low, which might identify a particular employer).

Table 47. Number of Businesses by Industry Sector in Everett, 2010-2016

Industry Group	2010	2011	2012	2013	2014	2015	2016	% change
Agriculture, Forestry, Fishing, Hunting (11)	NA	NA	NA	NA	NA	NA	NA	NA
Mining, Quarrying, Oil and Gas Extraction (21)	NA	NA	NA	NA	NA	NA	NA	NA
Utilities (22)	3	4	NA	3	NA	3	3	0.0%
Construction (23)	100	105	95	95	110	116	128	13.3%
Manufacturing (31-33)	48	49	48	46	45	43	41	-6.8%
Wholesale Trade (42)	62	57	57	56	52	51	51	-1.0%
Retail Trade (44-45)	111	114	109	112	121	125	125	1.6%
Transportation and Warehousing (48-49)	28	30	30	33	36	42	43	10.3%
Information (51)	5	4	4	4	4	4	4	0.0%
Finance and Insurance (52)	31	36	33	34	33	32	32	-1.5%
Real Estate and Rental and Leasing (53)	20	20	20	23	21	20	20	-2.4%
Professional and Technical Services (54)	41	41	39	35	40	45	46	8.2%
Administrative and Waste Services (56)	32	39	42	44	48	51	46	-7.1%
Education Services (61)	NA	NA	NA	NA	NA	NA	NA	NA
Health Care and Social Assistance (62)	35	35	38	148	151	173	204	25.9%
Arts, Entertainment, and Recreation (71)	8	10	8	8	9	11	10	0.0%
Performing Arts, Spectator Sports & Related (711)	NA	NA	NA	NA	NA	NA	NA	NA
Museums, Historical Sites & Related (712)	NA	NA	NA	NA	NA	NA	NA	NA
Amusement, Gambling & Recreation (713)	8	10	8	8	8	9	9	5.9%
Accommodations and Food Services (72)	79	84	87	88	88	87	90	2.9%
Accommodation (721)	3	NA	NA	NA	NA	NA	NA	NA
Food Services & Drinking Places (722)	76	82	84	85	86	85	89	4.1%
Other Services, excluding Public Admin (81)	153	163	171	69	76	81	81	3.2%
Public Administration (92)	NA	NA	NA	NA	NA	NA	NA	NA

Source: OLWD, ES-202. Note: NA indicates the data has been suppressed (often because the numbers are too low, which might identify a particular employer).

Table 48. Number of Businesses by Industry Sector in Middlesex County, 2010-2016

Industry Group	2010	2011	2012	2013	2014	2015	2016	% change
Agriculture, Forestry, Fishing, Hunting (11)	78	87	92	93	98	106	106	3.9%
Mining, Quarrying, Oil and Gas Extraction (21)	14	15	14	14	15	13	15	7.1%
Utilities (22)	73	75	74	78	84	83	92	10.2%
Construction (23)	4,602	4,633	4,239	4,159	4,398	4,582	4,716	5.0%
Manufacturing (31-33)	1,816	1,831	1,768	1,716	1,730	1,717	1,696	-1.6%
Wholesale Trade (42)	2,872	2,905	2,734	2,667	2,697	2,710	2,734	1.1%
Retail Trade (44-45)	5,003	5,029	4,887	4,875	4,997	4,934	4,938	-0.6%
Transportation and Warehousing (48-49)	814	828	813	821	847	881	895	3.6%
Information (51)	1,325	1,364	1,342	1,339	1,441	1,487	1,510	3.1%
Finance and Insurance (52)	2,129	2,148	2,123	2,083	2,140	2,166	2,167	0.7%
Real Estate and Rental and Leasing (53)	1,491	1,499	1,476	1,514	1,545	1,584	1,619	3.5%
Professional and Technical Services (54)	8,474	8,815	8,496	8,496	9,019	9,218	9,307	2.1%
Administrative and Waste Services (56)	2,644	2,729	2,685	2,668	2,783	2,887	2,921	3.0%
Education Services (61)	903	958	945	967	1,039	1,109	1,158	7.8%
Health Care and Social Assistance (62)	4,025	4,098	4,095	7,247	7,835	8,392	9,009	11.0%
Arts, Entertainment, and Recreation (71)	744	765	767	786	834	854	866	2.6%
Performing Arts, Spectator Sports & Related (711)	213	216	214	223	238	235	229	-3.2%
Museums, Historical Sites & Related (712)	43	43	42	41	44	45	47	5.6%
Amusement, Gambling & Recreation (713)	488	506	511	522	552	574	590	4.8%
Accommodations and Food Services (72)	3,309	3,431	3,373	3,425	3,461	3,530	3,562	1.9%
Accommodation (721)	150	155	154	153	155	148	157	3.6%
Food Services & Drinking Places (722)	3,159	3,276	3,219	3,272	3,306	3,382	3,405	1.8%
Other Services, excluding Public Admin (81)	7,738	8,046	8,351	5,610	5,872	5,993	6,088	2.6%
Public Administration (92)	585	583	578	668	670	678	687	1.9%

Source: OLWD, ES-202. Note: NA indicates the data has been suppressed (often because the numbers are too low, which might identify a particular employer).

Three key informants from Plainville had the following comments about economic development:

“We have had a lot of interest in the surrounding area along route one.....the sections of route one, where you see the really large developments coming in, they were undeveloped so there was nothing there. So it’s not like they are driving out the small businesses.....This area is really becoming a destination [...] I think you will continue to see development, along route 1 from the casino all the way to the stadium.” Jennifer Thompson, Town Administrator, Plainville, MA, January 25, 2018, 10am-11am, phone interview.

“Wow, we have had an awful lot of influx of new businesses. [...] Because we were ripe for new businesses and growth in town because we were one of the least expensive communities in the area and we had land to develop. So it was natural that they were looking..... We have had no problem keeping restaurants in town very very healthy. That was one of the problems, people were saying, ‘Oh it will knock the small restaurants out. No that is not true. They are thriving.” Kathleen Parker, Treasurer of Plainville, MA, February 1, 2018, 11-12pm, 2018, phone interview.

“On the corner at the diagonal opposite of the casino, I have had plans come through my board for two hotels, a restaurant, a small waste water treatment plant, and some housing, all in that opposite corner.....The dual hotel restaurant, shopping center residence that is going directly across from the casino [...]I believe there was a need for a hotel because of the casino. That helped influence the building of the hotel. It would not be exclusive, but it would be a contributing factor. Lou LeBlanc, Chairman of the Board of Health, Plainville, MA, March 1, 2018, 5-6pm, phone interview.

Impacts on Other Types of Gambling

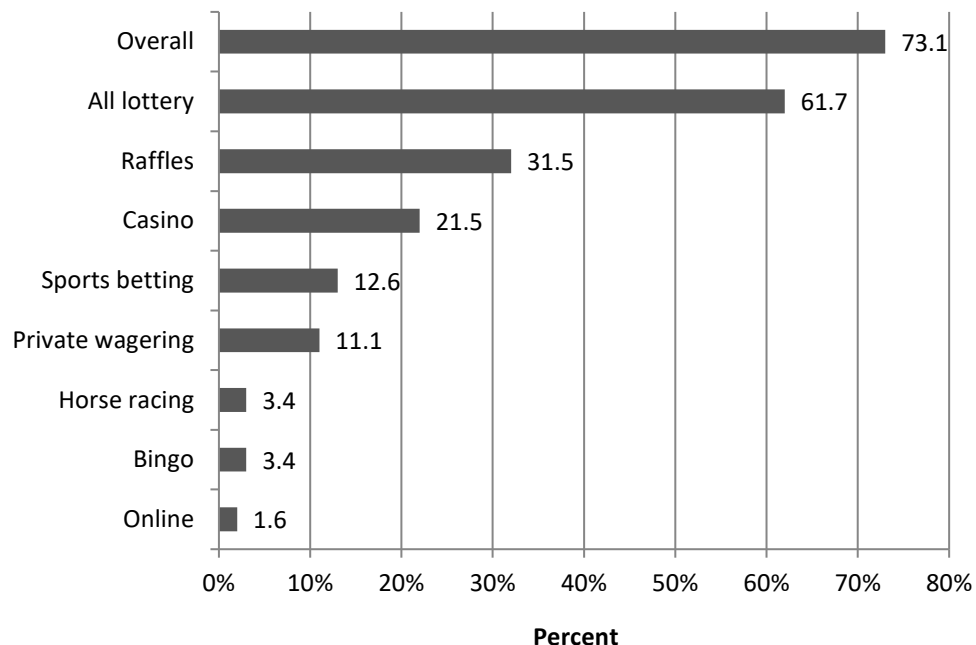
Negative impacts on other types of gambling are often a consequence of introducing a new form of gambling (Williams, Rehm, & Stevens, 2011). This section focuses on whether there is any evidence of change in the patronage and revenue of other forms of gambling in Massachusetts, both in the state as a whole and regionally.

Statewide Impacts

Baseline Levels

Population participation in individual types of gambling was established in the 2013/2014 Baseline General Population Survey (BGPS) (Volberg et al., 2017). As can be seen in Figure 38 the overall past-year participation rate was 73.1%, with lottery products (traditional lottery, daily lottery, and instant lottery) being the most popular individual format. The FGPS in 2020 will determine whether there have been any significant changes in the pattern of gambling participation after the introduction of three casinos.

Figure 38. Past Year Participation in Various Types of Gambling in MA in 2013/2014, Weighted



Source: BGPS in Volberg et al. (2017)

Changes over Time in Relation to Casino Introduction

Table 49 shows the prevalence of each individual type of gambling in the MAGIC study from Wave 2 in 2015 to Wave 3 in 2016, when limiting the sample to participants who completed both waves. (As a reminder, the Baseline to Follow-Up General Population Surveys will serve as the primary data source to ascertain whether significant changes in the pattern of gambling has occurred in the general population. The MAGIC data is presented as it is the only data that bears on this issue at the present time). A McNemar test was utilized to test for significant differences between the two waves.

Table 49. Changes in Gambling Prevalence within the MAGIC Cohort, 2015 to 2016

	Wave 2: 2015			Wave 3: 2016			p
	N	%	95% CI	N	%	95% CI	
Any Lottery Product	1,768	72.4	(70.6 - 74.2)	1,889	77.4	(75.7 - 79.0)	<.0001
Traditional Lottery	1,704	69.6	(67.8 - 71.4)	1,807	73.8	(72.0 - 75.5)	<.0001
Instant Games	1,145	47.1	(45.1 - 49.0)	1,227	50.4	(48.4 - 52.4)	.0002
Daily Lottery Games	481	19.8	(18.3 - 21.4)	855	35.2	(33.3 - 37.1)	<.0001
Raffles	1,042	42.9	(40.9 - 44.8)	1,091	44.9	(42.9 - 46.9)	.057
Casino Out-of-State	735	31.8	(30.0 - 33.8)	506	21.9	(20.3 - 23.7)	<.0001
Electronic Gambling Machines (EGM)	Not asked in Wave 2			535	21.9	(20.3 - 23.6)	
Casino Table Games	Not asked in Wave 2			296	12.1	(10.9 - 13.5)	
Sports Betting	434	17.9	(16.4 - 19.4)	409	16.8	(15.4 - 18.4)	.176
Private Betting	353	14.4	(13.1 - 15.9)	Not asked in Wave 3			
Horse Racing	168	6.9	(6.0 - 8.0)	141	5.8	(4.9 - 6.8)	.017
Bingo	128	5.3	(4.5 - 6.2)	174	7.2	(6.2 - 8.3)	<.0001
Online Gambling	46	2.0	(1.5 - 2.7)	151	6.6	(5.6 - 7.7)	<.0001

Horse Racing

The above table shows a significant decrease in the prevalence of horse race betting within the MAGIC cohort from 2015 (6.9%) to 2016 (5.8%), continuing the downward trend that has been occurring for many years (Temple, 2009, 2010). However, overall amount wagered on horse racing *increased* to \$229.4 million in calendar 2016 versus \$194.6 in 2015 (203.0 million in 2014 and \$207.5 million in 2013) (MA Gaming Commission, 2016), potentially attributable to increased purse size from the [Race Horse Development Fund](#). A total of 18% of gross profits on slots and electronic table games at PPC go to the [Race Horse Development Fund](#) (and 2.5% of the future gross gambling revenue of MGM Springfield and Encore Boston Harbor) which was created as part of the Expanded Gaming Act to support the horse racing industry in the state. This amounted to \$7.9 million in calendar 2015, \$14.0 million in calendar 2016, and \$14.8 million in calendar 2017 (MGC, 2018). Money in the Race Horse Development Fund is further divided among three main programs. The majority (80%) of funds are for the purposes of increasing the prize money (purse) at the track, whereas 16% is used for horse breeding programs, and 4% is put towards health and pensions for racing industry workers.

Charitable Gambling

Charitable gambling consists of bingo, raffles, instant lottery tickets ('break-open tickets', 'pull-tabs', 'charity tickets'), and short-term 'casino events' whereby traditional casino table games are provided. Within the MAGIC cohort Table 49 shows no significant change in participation in raffles, but a significant increase for bingo from 2015 to 2016. In terms of revenue, in calendar 2016, Massachusetts residents spent \$59,533,184 on charitable gambling, with 45.3% of this on bingo, 32.3% on raffles, 21.8% on instant lottery tickets, and 0.6% on casino events (Massachusetts State Lottery Commission, 2016a). This is an increase of \$1.56 million (unadjusted for inflation) from calendar 2015 when gross receipts amounted to \$57,976,236, with 47.6% of this on bingo, 30.3%

on raffles, 21.5% on instant lottery tickets, and 0.5% on casino events (Massachusetts State Lottery Commission, 2016a). However, 2016 represents a decrease from calendar year 2014 when gross charity gambling revenue totalled \$61,508,293. As a reference point, in calendar 2008 gross charity gambling revenue was \$87.9 million.

Casino Gambling

Table 49 shows a significant decrease in out-of-state casino patronage within the MAGIC cohort from 2015 to 2016. As discussed in greater detail in the *Operating Revenue* subsection of the Plainridge Park Casino section, this result is consistent with findings from the 2016 PPC Patron Survey (Salame et al., 2017), but inconsistent with results from the Plainville Targeted Population Surveys and actual casino revenue in Rhode Island and Connecticut. An additional caution in interpreting the present comparison is that there was only a single question about out-of-state casino patronage in Wave 2 (as MA-based EGMs and casino table games were not yet available),⁴⁰ whereas in Wave 3 questions were asked about EGM participation, casino table game participation, and then out-of-state patronage of EGMs and/or table games (if they indicated they had played EGMs or table games). It is unclear whether the different question wordings could or would have any impact on obtained prevalence rates.

Other Types of Gambling

Table 49 shows no significant change within the MAGIC cohort in sports betting, but a significant increase in online gambling. The increase in online gambling is partly artifactual as online gambling was asked as a single question in Wave 2, whereas it was asked as a supplemental question for each individual type of gambling in Wave 3 (i.e., if the person indicated they participated in a particular type of gambling they were asked whether it was online or land-based participation). Also, daily fantasy sports (which are online) was added as an additional question in Wave 3. Obtained prevalence rates tend to increase when questions about involvement are asked in a repeated and more specific fashion such as this (Wood & Williams, 2007b).

Lottery

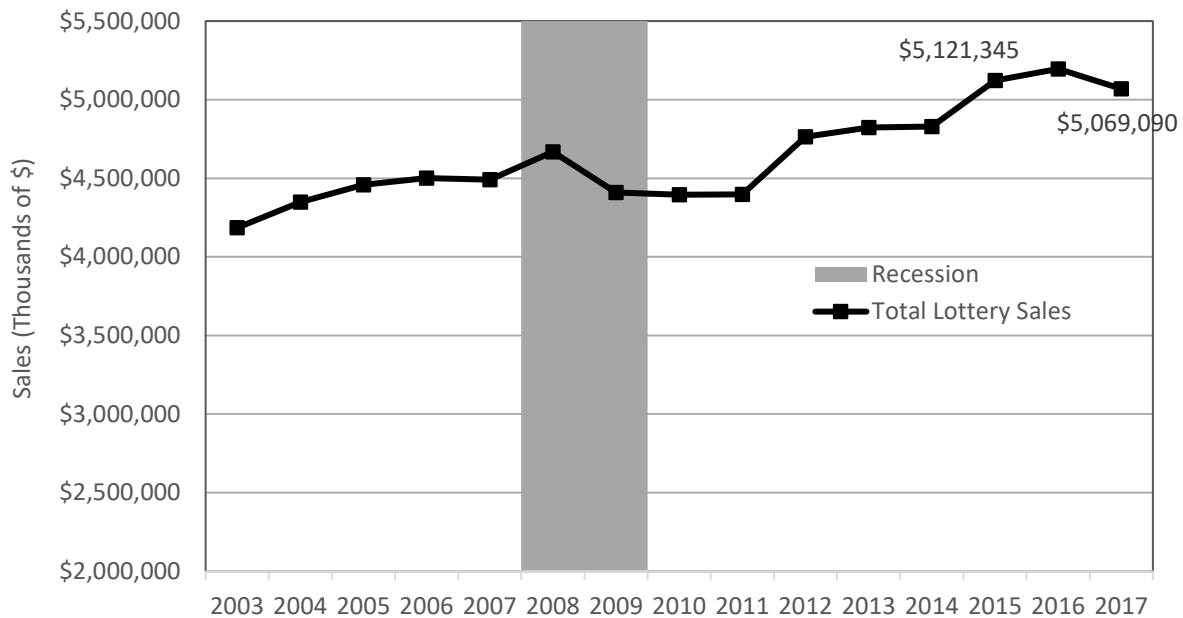
Table 49 shows a significant increase in overall lottery participation from 2015 to 2016, which is attributable to specific increases in 'traditional lottery' and 'daily lottery'. The increase in traditional lottery is likely real, attributable to interest in a large Powerball jackpot in 2016. This is also reflected in an increase in Powerball revenue from \$101.9 million in FY2015 to \$169.1 million in FY2016 (Massachusetts State Lottery Commission, 2016b). The basis for the reported increase in participation in daily lottery games is uncertain, as revenue for these formats only slightly increased from \$1.25 billion in FY2015 to \$1.32 billion in FY2016 (Massachusetts State Lottery Commission, 2016b). Here again, it is possible that a minor change of questionnaire wording may account for the increase as only Keno and Jackpot Poker were given as examples of daily lottery games in Wave 2 whereas Mass Cash and the Numbers Game were added as additional examples of daily lottery games in Wave 3.

Gross lottery sales from 2003 to 2017 are displayed in Figure 39 (Nichols, 2017). Average annual sales growth over this period not adjusted for inflation is 1.4%.⁴¹ Like many state lotteries, sales during the 2008-2009 recession flattened and even declined. Sales growth has increased since FY2011, with the first decline being in FY2017. However, sales in FY2017 are only down 1.0% from FY2015 (July 1, 2014 – June 30, 2015), which is the period immediately prior to the opening of PPC.

⁴⁰ 93.8% of the MAGIC cohort in Wave 2 was assessed prior to the opening of Plainridge Park Casino.

⁴¹ In inflation adjusted dollars, sales for fiscal year 2017 was approximately the same as sales for fiscal year 2008 and is below sales for fiscal year 2003. In inflation adjusted dollars, the annualized growth rate from 2003-2017 was -0.64%.

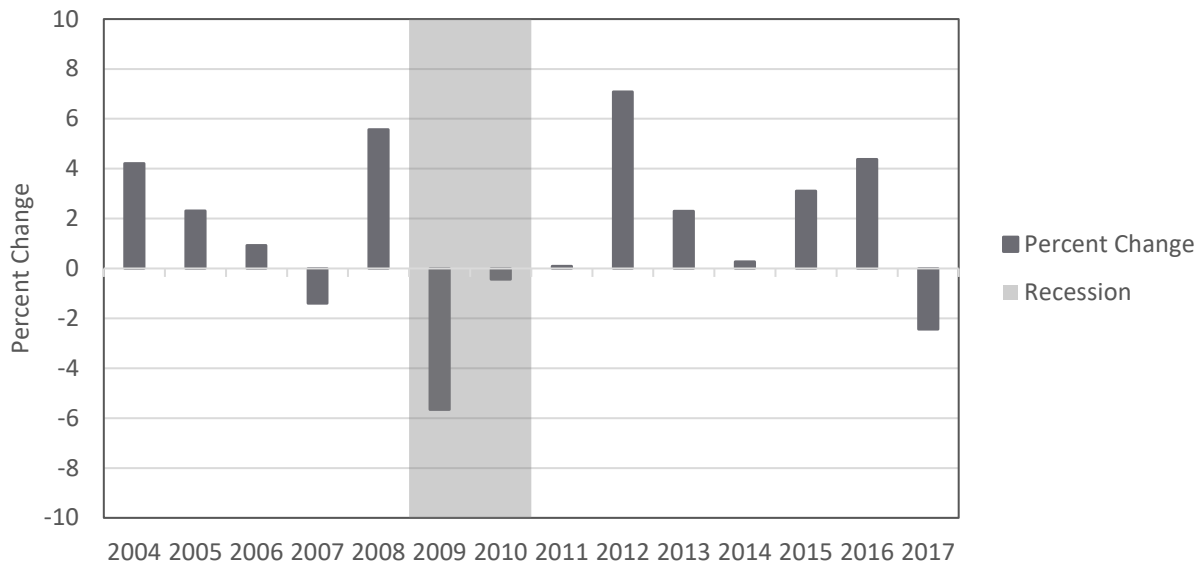
Figure 39. MA Lottery Sales, FY 2003-2017, Not Adjusted for Inflation



Source: MA Lottery

Figure 40 presents the annual percentage change in lottery sales between 2004 and 2017 in more detail. This figure demonstrates the variation that occurs in lottery sales growth year-to-year, even in non-recession years. In general, considering this natural year-to-year variation and the lack of difference from FY2014 to FY2017, if PPC has had any effect on lottery sales it has been very minor (Nichols, 2017). Further evidence of the small magnitude of effect is found in the Plainridge Park Patron Survey where only 21.2% of Massachusetts residents reported spending less on other things due to their PPC spending, with roughly 25% of these people reporting that this reallocation came from spending less on the Massachusetts Lottery (Salame et al., 2017). However, this is potentially offset by the fact that lottery sales at Plainridge Park increased substantially (25.8%) after the opening of the casino (Nichols, 2017).

Figure 40. Annual Percent Change in MA Lottery Sales from Previous Year, FY 2004-2017



Source: MA Lottery

Regional Impacts

Table 50 shows changes in participation in specific types of gambling in both the Plainville Baseline Targeted Population Survey in 2014 and the Plainville Follow-Up Targeted Population Survey in 2016/2017. A Chi-Squared test is employed to establish whether significant differences exist.

Table 50. 2014 Baseline versus 2016/2017 Follow-Up Participation in Gambling in the PPC H&SC, Weighted

	BTPS-Plainville			FTPS-Plainville			p
	N	%	95% CI	N	%	95% CI	
All lottery	195,115	66.4	(62.3 - 70.2)	200,728	67.2	(62.8 - 71.3)	.782
Traditional Lottery	185,874	63.2	(59.1 - 67.2)	182,647	60.7	(56.3 - 65.0)	.407
Instant Games	119,922	40.8	(36.6 - 45.0)	127,236	42.5	(38.1 - 46.9)	.584
Daily Games	35,514	12.1	(9.5 - 15.3)	40,231	13.5	(10.7 - 17.0)	.520
Raffles	106,932	36.6	(32.7 - 40.8)	110,113	36.9	(32.8 - 41.3)	.916
Casino Out-of-State	66,291	23.2	(20.0 - 26.9)	82,685	28.3	(24.3 - 32.6)	.070
Sports Betting	43,412	14.8	(12.0 - 18.1)	37,913	12.7	(10.1 - 15.8)	.313
Private Betting	40,018	13.7	(10.7 - 17.4)	26,288	8.8	(6.6 - 11.8)	.024
Horse Racing	15,614	5.3	(3.9 - 7.2)	16,845	5.6	(3.9 - 8.0)	.809
Bingo	9,310	3.2	(2.1 - 4.9)	12,845	4.3	(2.8 - 6.4)	.335
Online Gambling	5,736	2.0	(1.0 - 3.7)	8,464	2.8	(1.7 - 4.7)	.366

N is the total number of respondents who answered the question weighted to the PPC H&SC population

Horse Racing

Table 50 shows no significant change in horse race betting participation in the PPC H&SC from 2014 (5.3%) to 2016/2017 (5.6%). This is even though a greater number of people were exposed to horse racing in 2016/2017 with an increase in visitors to the PPC. In this regard, only 7.7% of PPC patrons reported engaging in horse race

betting at the facility in 2016 (Salame et al., 2017). However, as seen in Table 51, Plainridge Racecourse has had a significant increase in the number of races since 2014 as well as stabilized overall amount wagered.

Table 51. Number of Races and Amount Wagered at Plainridge Racecourse, 2013-2016

Year	Number of Races	Amount Wagered
2013	780	\$38.2 million
2014	736	\$33.4 million
2015	949	\$30.3 million
2016	1092	\$35.8 million

Source: [MA Gaming Commission Division of Racing Annual Reports](#)

Charitable Gambling

Table 50 also shows no significant change in PPC H&SC participation rates in either raffles or bingo from 2014 to 2016/2017. Table 52 documents gross bingo revenue and per capita bingo spending in Norfolk County (where Plainville is located) as well as Hampden and Middlesex Counties from calendar 2014 to 2017 from the annual reports (MA State Lottery Commission, 2016a, 2017b). Minor declines from 2014 to 2016 are seen in all three counties, which continue in 2017. The biggest 2014 to 2016 decline (15.0%) occurred in Middlesex and the smallest decline in Norfolk County. Attleboro is the only individual community within the PPC H&SC to have bingo. It experienced a 10.4% decline in gross bingo revenue from 2014 (\$294,903) to 2016 (\$264,347). No comparable geographic data is publicly available for raffles, instant lotteries, and casino events.

Table 52. Gross Bingo Revenue in Selected Counties, Calendar Year 2014 to 2017

County	2014	2015	2016	2017
Norfolk County	\$3,914,000 (\$37.35 per capita)	\$3,551,269 (\$37.94 per capita)	\$3,868,994 (\$38.66 per capita)	\$3,503,683 (\$39.98 per capita)
Hampden County	\$4,431,822 (\$35.13 per capita)	\$4,263,750 (\$34.80 per capita)	\$4,391,928 (\$35.90 per capita)	\$4,238,019 (\$38.88 per capita)
Middlesex County	\$5,734,650 (\$32.58 per capita)	\$5,195,062 (\$32.55 per capita)	\$4,875,615 (\$32.06 per capita)	\$4,617,292 (\$32.59 per capita)

Source: MA State Lottery Commission Charitable Games Annual Reports

Other Types of Gambling

There was a significant decrease in the percentage of people engaging in private betting in 2016/2017 relative to 2014.

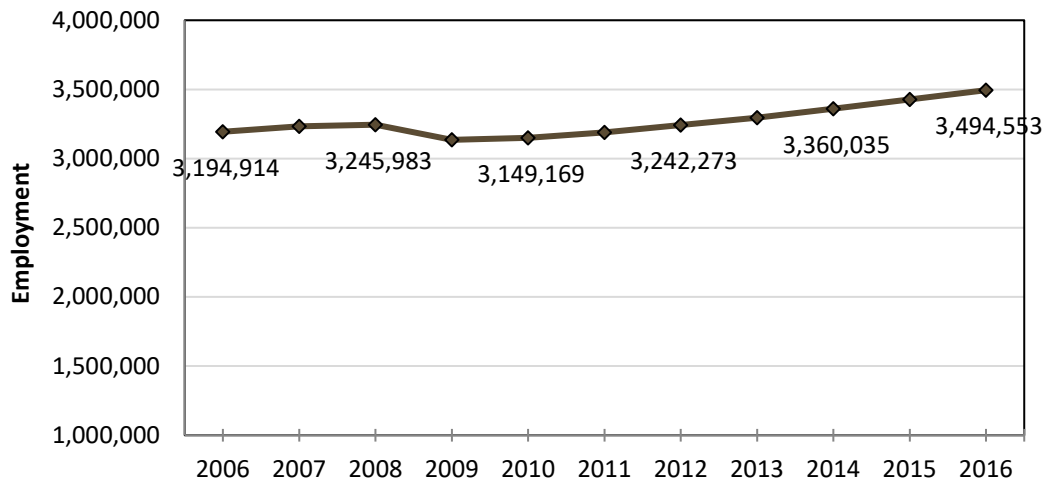
EMPLOYMENT

Statewide Impacts

Changes over Time in Relation to Casino Introduction

There is no theoretical reason to currently expect statewide employment changes due to casino introduction. Thus, the following figures are provided primarily for context. Figure 41 illustrates employment numbers in Massachusetts from 2006 to 2016, as taken from the US Bureau of Labor Statistics (BLS) and the Quarterly Census of Employment and Wages (QCEW) (US Department of Labor, 2018b). As seen, employment numbers have steadily increased since 2010, with a 4.0% overall increase from 2014 to 2016.

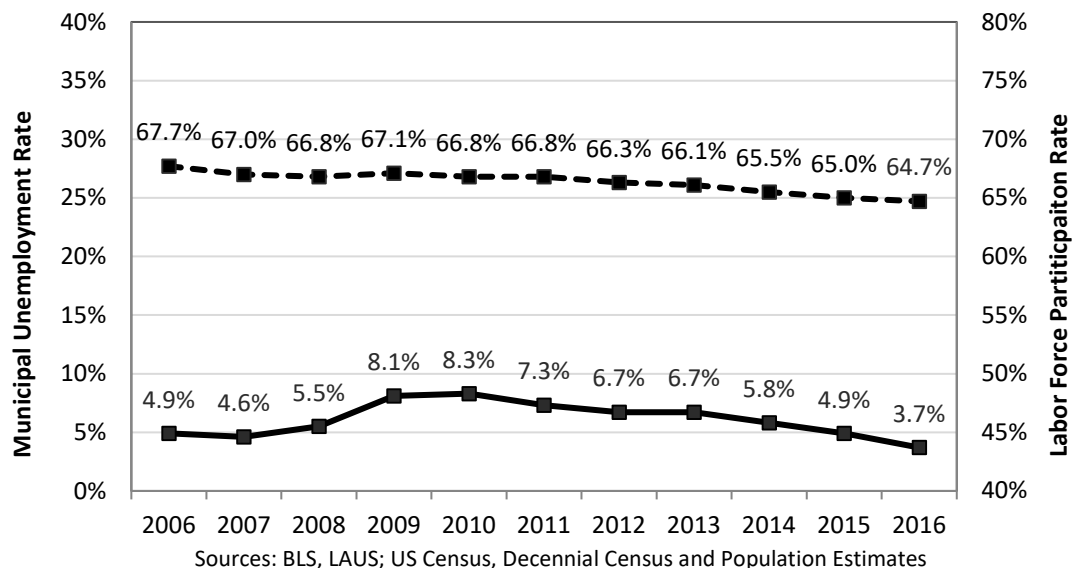
Figure 41. Massachusetts Employment Numbers, 2006-2016



Source: BLS, QCEW

Figure 42 illustrates that labor force participation in Massachusetts (the top line) has been dropping slowly since 2009, along with a more marked drop in the unemployment rate (the lower line). From 2014 to 2016 there was a 1.2% drop in labor force participation, and a 36.2% drop in unemployment. While the unemployment rates can provide a measure of worker distress, the labor force participation rate is also useful because it includes discouraged workers who have left the work force and are no longer captured in the unemployment data.

Figure 42. Massachusetts Labor Force Participation Rate and Unemployment Rate, 2006-2016

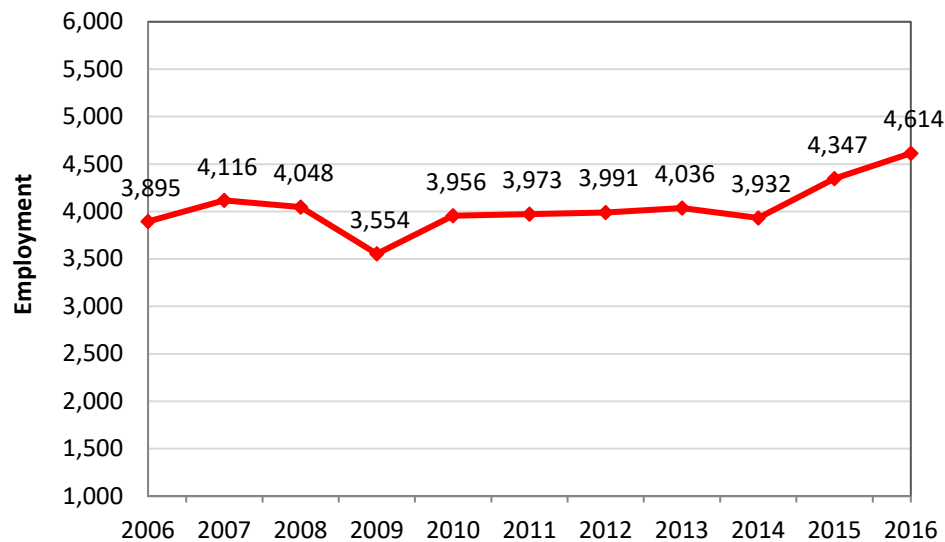


Sources: BLS, LAUS; US Census, Decennial Census and Population Estimates

Regional Impacts

As see in Figure 43, the Town of Plainville is experiencing the highest level of employment in a decade, with 2015 and 2016 showing notable increases. Plainville's 372 businesses employed 4,614 people in 2016, an increase of 17.3% since 2014. This compares to employment growth of 4.0% in the state and 3.2% Norfolk and Bristol Counties from 2014 to 2016. The increase in Plainville parallels to some extent the population increase in this community (Figure 23). It is also consistent with the creation of more than 500 jobs at PPC, with 25.6% of these being in the Metro Boston economic region (where Plainville is located). The Town of Plainville's [Host Community Agreement](#) with PPC required that PPC preferentially hire Plainville residents during both the construction and operation phase.

Figure 43. Plainville Employment, 2006-2016



Source: Massachusetts Office of Labor and Workforce Development (OLWD), Labor Market Information, ES-202

As further reference, Table 53 shows the increase in employment in all of the PPC H&SC from 2009 from 2016. Foxborough is the only community with equivalent growth to Plainville.

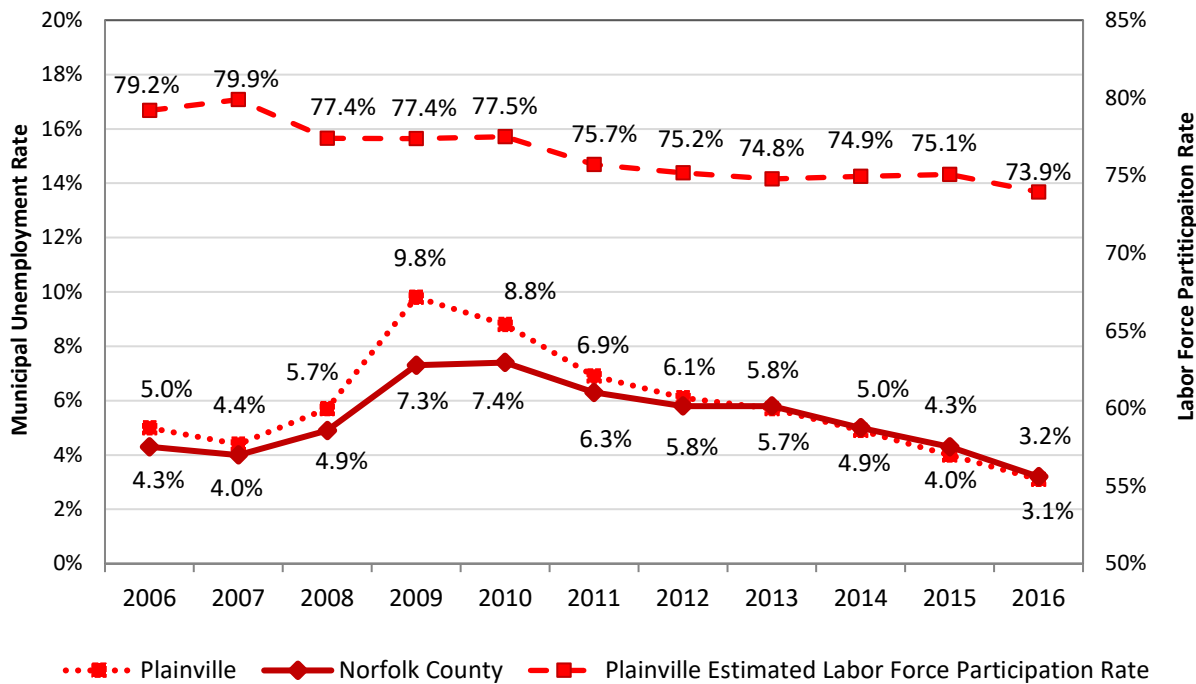
Table 53. Employment in PPC H&SC

Community	2016 Employment	% Change 2009-2016
Plainville	4,614	29.8%
Attleboro	17,790	7.8%
Foxborough	14,572	29.1%
Mansfield	12,253	12.1%
North Attleborough	12,122	9.1%
Wrentham	7,038	17.4%

Source: Massachusetts Office of Labor and Workforce Development (OLWD), Labor Market Information, ES-202

In contrast to overall employment numbers, unemployment and labor force participation rates in Plainville have largely paralleled the state and Norfolk County as seen in Figure 44.⁴² From 2014 to 2016 Plainville’s labor force participation rate decreased by 1.3% and its unemployment rate decreased by 36.7% (compared to a 1.2% decrease in the labor force participation rate and a 36.2% decrease in the unemployment rate in the state as reported earlier in Figure 42).

Figure 44. Plainville and Norfolk County Unemployment and Plainville Labor Force Participation, 2006-2016



Sources: BLS, LAUS; US Census, Decennial Census and Population Estimates

Table 54 documents employment changes within Plainville in different industry sectors from 2010 to 2016. The shaded columns denote the period of PPC construction and operation. The last column shows the net change in jobs in the construction/operation years (2014-2016) relative to the two prior years (2012-2013). For known industries, the largest net gain was in construction (78.8 jobs), followed by professional and technical services and management of companies/enterprises, whereas there was a notable loss of jobs in administrative and waste services. The gain in the construction sector is plausibly related to the construction of PPC.

⁴² Plainville’s participation rate is estimated using Census population estimates and LAUS data at the local level and utilizes less reliable data due to the much smaller sample size of the municipality.

Table 54. Plainville Employment by Industry Sector, 2010-2016

Industry Group	2010	2011	2012	2013	2014	2015	2016	Change
Industry not known	290	258	270	263	276	568	732	258.8
Construction	341	325	310	341	370	399	444	78.8
Professional and Technical Services	97	102	112	138	159	157	143	28.0
Management of Companies/Enterprises	0	0	0	9	27	28	30	23.8
Real Estate and Rental and Leasing	24	24	27	47	52	50	50	13.7
Retail Trade	742	817	830	838	828	847	842	5.0
Finance and Insurance	78	74	82	79	86	83	85	4.2
Accommodations & Food Services	578	591	595	584	575	586	616	2.8
Educational Services	0	183	180	196	194	186	189	1.7
Information	12	11	10	10	10	11	11	0.7
Arts, Entertainment, and Recreation	176	0	0	0	0	0	0	0.0
Wholesale Trade	67	68	77	71	70	73	72	-2.3
Other Services, e.g., Public Admin	120	122	142	118	124	125	132	-3.0
Manufacturing	421	452	479	434	431	456	466	-5.5
Health Care and Social Assistance	317	301	300	463	372	350	370	-17.5
Transportation and Warehousing	40	42	50	60	0	40	50	-25.0
Administrative and Waste Services	653	603	527	385	358	388	382	-80.0
Total	3,956	3,973	3,991	4,036	3,932	4,347	4,614	284.2

Source: OLWD, ES-202. Note: ES-202 data at the detailed industry (or sector) level are subject to suppression, and are therefore sometimes lower than the total. These data at this level of industry detail may underestimate the employment and number of firms in the individual industries presented. "Industry not known" is the remainder created by subtracting the aggregation of the counts from the known industry detail from the total across all industries. The industries are unknown due to suppression.

Two key informants from Plainville had the following comments about employment:

*"One of the things that [the casino] promised to do was to reach out to Plainville folks first in terms of employment which they did. They kept their word. ... They are our largest employer in Plainville. It has certainly had an impact.....I remember when the casino first opened that was a challenge for them [backfill issues]. And part of it was they had a lot of applicants but some of them couldn't pass the scrutiny of the background checks and the things that the Gaming Commission requires.....I know it was difficult for the restaurants in particular. When they opened they didn't have as much of the staff as they wanted in the beginning....They were having difficulty of getting people who were qualified but who could also pass the more rigorous background check, because even if you work in the restaurant you still have to pass the same background check as if you were working in the casino itself.....I think we would hear about it [job quality] if people felt grossly mistreated or had horrible working conditions and we haven't heard anything like that. Jennifer Thompson, Town Administrator, Plainville, MA
January 25, 2018, 10am-11am, phone interview.*

As far as employment goes, it has definitely been a positive impact.....I actually had one of the [horse] trainers lived right down the road from me....He was the one who told me how much more exciting the horse racing is now and how well he is doing as a result of this influx of money and direct attention to the horse racing. Lou LeBlanc, Chairman of the Board of Health, Plainville, MA, March 1, 2018, 5-6pm, phone interview.

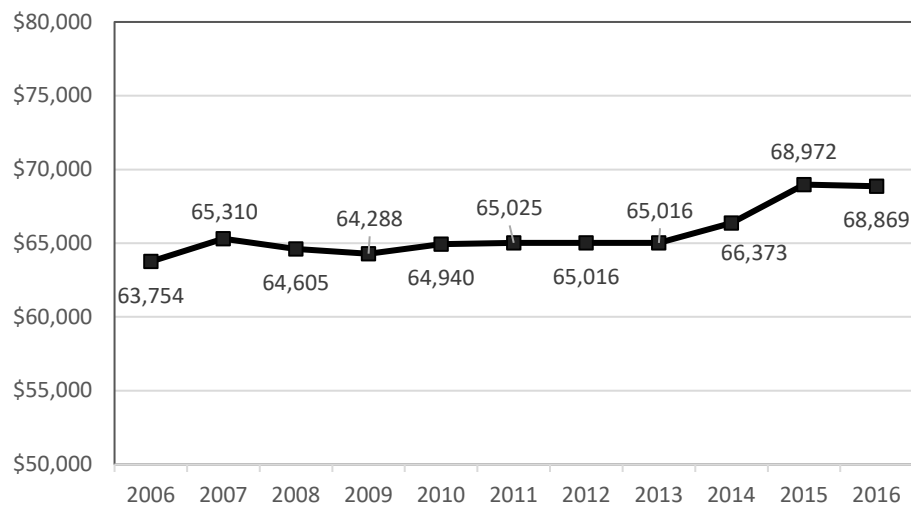
PERSONAL INCOME

Wages

Statewide Impacts

Provided as a reference point, Figure 45 illustrates the average annual wages in Massachusetts from 2006 to 2016 as taken from the U.S. Department of Labor (2018): U.S. Bureau of Labor Statistics (BLS), Quarterly Census of Employment and Wages (QCEW).

Figure 45. Average Annual Wages in Massachusetts, 2006-2016 (2017 dollars)



Source: U.S. Dept of Labor: BLS, QCEW

As a further reference point, the U.S. Census indicates that the Massachusetts median household income has increased from \$71,166 in the period 2008-2012 to \$72,466 in the period 2012-2016 in inflation-adjusted dollars.

Regional Impacts

Although employment levels are high in Plainville, average wages provided by businesses in town are not. In fact, Plainville's average wages are significantly lower than the state and in the immediate region (Norfolk and Bristol Counties) as seen in Table 55. The average annual wage for jobs based in Plainville was \$41,740 in 2016 in inflation-adjusted dollars compared to the Massachusetts average of \$68,869, and \$57,883 in the immediate region. That being said, Plainville experienced a larger increase in the average wage from 2013/2014 to 2016 than either the immediate region or the state.

Table 55. Plainville Annual Average Wages, All Industries, 2010-2016 (in 2017 Dollars)

Region	2010	2011	2012	2013	2014	2015	2016	% increase from 2013/2014 to 2016
Plainville	\$38,721	\$38,263	\$38,047	\$37,507	\$39,658	\$41,663	\$41,740	8.2%
Norfolk & Bristol Counties	\$55,831	\$55,572	\$55,825	\$55,600	\$55,986	\$58,461	\$57,883	3.7%
Massachusetts	\$64,940	\$65,025	\$65,016	\$65,016	\$66,373	\$68,972	\$68,869	4.8%

Sources: Massachusetts Office of Labor and Workforce Development (OLWD), Labor Market Information, ES-202; US Bureau of Labor Statistics (BLS), Quarterly Census of Employment and Wages (QCEW)

Table 56 shows this same pattern for all of the individual Host and Surrounding Communities.

Table 56. Wages in the PPC H&SC (2017 dollars)

Community	Average Wage in 2016	% Change 2009-2016
Plainville	\$41,740	37.9%
Attleboro	\$49,776	13.0%
Foxborough	\$69,815	34.5%
Mansfield	\$79,787	28.6%
North Attleborough	\$37,033	17.1%
Wrentham	\$37,169	19.0%

Source: OLWD, ES-202

Although individual wages paid by businesses in the PPC H&SC are low, household income is not. Table 57 shows that Plainville's median household income, estimated at \$93,974 in the 2012-2016 [American Community Survey](#) (the most recent data available), is higher than the median Massachusetts household income (estimated at \$72,466 in the same period), but similar to Norfolk County, where the median household income is \$92,148. Comparing the two most recent 5-year periods in the ACS, shows that household income increased in both Plainville and Norfolk County. The higher levels of household income in Plainville in contrast to low individual wages in the town suggests that many residents commute outside of Plainville for work.

Table 57. Plainville and Norfolk County Median Household Income (2017 dollars), 2008/2012 - 2012/2016

	2008-2012	2012-2016
Plainville	\$89,413 ± \$12,565	\$93,974 ± \$6,458
Norfolk County	\$89,773 ± \$1,398	\$92,148 ± \$1,213

Source: U.S. Census, American Community Survey

Poverty Rate

Regional Impacts

Table 58 illustrates that Plainville's poverty rate of 3.6% (with 2.0% margin of error) in the 5-year period from 2012 to 2016 is a third of the poverty rate of Massachusetts and roughly half the rate of Norfolk County. Furthermore, whereas poverty rates have increased slightly in Norfolk County and the state from the 2008 to 2012 time period, they have dropped in Plainville.

Table 58. Plainville, Norfolk County, and Massachusetts Poverty Rate, 2008/2012 - 2012/2016

	2008/2012	2012/2016
Plainville	4.7% \pm 1.9%	3.6% \pm 2.0%
Norfolk County	6.5% \pm 0.3%	6.7% \pm 0.3%
Massachusetts	11.0% \pm 0.1%	11.4% \pm 0.2%

Source: U.S. Census, American Community Survey

Gambling Participation in Relation to Income

Statewide Impacts

Baseline Levels

An important issue concerns whether gambling acts as a form of regressive taxation, where poorer people contribute disproportionately more of their income to gambling revenue than people with higher incomes. This was investigated with data from the Baseline General Population Survey (Volberg et al., 2017). Table 59 documents the past year self-reported participation and expenditure on gambling and each specific type of gambling as a function of household income group. As a reference point, the median household income in Massachusetts in 2014 was \$70,115.

In terms of rates of gambling participation, these results indicate the following:

- For **gambling participation generally**, the majority of every income group participates, but participation is significantly higher in the \$50K – \$99.9K groups compared to the <\$50K groups.
- **Lottery products** are the only type of gambling where the majority of every income group participates, and there is relatively little variation in participation rates between groups. That being said, participation is significantly higher in the \$50K – \$99.9K groups compared to the <\$15K group.
- Purchase of **raffle tickets** increases linearly with higher income, with the highest income group (\$150K+), having rates almost three times greater than the lowest income group (<\$15K).
- Participation in **out-of-state casinos** ranges from 14.0% for the <\$15K income group to 25.9% for the \$100K-\$149.9K group. The \$50K – \$99.9K group has significantly higher rate of participation compared to the <\$30K groups.
- Participation in **sports betting** increases fairly linearly as a function of income group, with the highest income group (\$150K+), almost three times more likely to participate than the lowest income group (<\$15K).

- Participation in **private wagering** is significantly higher in all of the \$50K+ income groups compared to the \$15K - \$49.9K groups.
- Participation in **horse race betting** is less than 6% in all income groups, with significantly higher rates in the \$50K+ groups.
- Participation in **bingo** is 6% or less in all income groups. This is the only type of gambling where participation rates are significantly higher in a lower income group (\$15K - \$29.9K) relative to higher income groups (\$50K - \$149.9K).
- Participation in **online gambling** is 3% or less in all income groups with no significant differences between groups.

In terms of mean and median self-reported expenditure for all members of each income group (regardless of the portion who participate):

- There is no significant difference in mean expenditure between groups, but median expenditure for **all types of gambling combined** is significantly higher for the \$50K+ groups relative to the <\$15K income group.
- There is no significant difference in mean or median expenditure on **lottery products**.
- There is no significant difference in mean or median expenditure on **raffle tickets**.
- Mean **out-of-state casino** expenditure is significantly higher for the \$50K - \$149.9K income groups relative to the <\$15K income group.
- There is no significant difference in mean expenditure on **sports betting**.
- The highest income group (\$150K+) has a higher mean expenditure on **private wagering** relative to the \$30K-\$49.9K income group.
- There is no significant difference in mean expenditure on **horse race betting**.
- For **bingo**, the \$15K-\$29.9K income group has significantly higher mean spending relative to all income groups of \$50K and higher.
- There is no significant difference in mean expenditure on **online gambling**.

In general, the above results indicate that:

- Most forms of gambling have greater participation rates for middle and higher income groups, with this trend being strongest for raffles, sports betting, and private wagering. The exception is bingo, where participation is higher for low income groups.
- For expenditure, the data indicates that middle and higher income groups have higher average spending on overall gambling, out-of-state casinos, and private wagering, whereas low income groups have higher overall expenditure on bingo. The lack of spending differences for all other types of gambling (lottery products, raffles, sports betting, horse race betting, online gambling) implies a degree of regressivity, as lower income groups have less available income to spend on these products.

It will be instructive to see whether this pattern of results changes after all three casinos have opened.

Table 59. Past Year Participation and Expenditure on Gambling in Massachusetts in 2013/2014, Weighted

Household Income	Past Year Participation and 95% C.I.	Median Self-Reported Yearly Expenditure and 95% C.I. for Each Income Group	Mean Self-Reported Yearly Expenditure and 95% C.I. for Each Income Group	Median Self-Reported Yearly Expenditure and 95% C.I. for People who Participate	Mean Self-Reported Yearly Expenditure and 95% C.I. for People who Participate
All Gambling					
< \$15,000	63.5% (58.8 - 67.9)	\$0 (0 - 24)	<i>\$1,813 (673 - 2,954)</i>	\$144 (120 - 180)	<i>\$2,857 (1,074 - 4,641)</i>
\$15,000 - \$29,999	71.6% (67.4 - 75.5)	\$36 (14 - 60)	<i>\$973 (290 - 1,656)</i>	\$180 (120 - 186)	<i>\$1,359 (411 - 2,307)</i>
\$30,000 - \$49,999	69.7% (65.6 - 73.4)	\$24 (11 - 59)	<i>\$3,489 (-484, 7,461)</i>	\$180 (135 - 240)	<i>\$5,012 (-688 - 10,713)</i>
\$50,000 - \$99,999	78.4% (76.0 - 80.6)	\$60 (51 - 83)	<i>\$975 (694 - 1,257)</i>	\$144 (120 - 180)	<i>\$1,244 (888 - 1,601)</i>
\$100,000 - \$149,999	82.8% (79.6 - 85.6)	\$60 (49 - 72)	<i>\$1,171 (532 - 1,811)</i>	\$120 (93 - 147)	<i>\$1,415 (645 - 2,184)</i>
\$150,000 +	77.0% (73.7 - 79.9)	\$60 (50 - 108)	<i>\$802 (473 - 1,131)</i>	\$170 (120 - 201)	<i>\$1,042 (617 - 1,468)</i>
Lottery Products					
< \$15,000	56.7% (51.9 - 61.4)	\$0 (0 - 0)	<i>\$1,232 (356 - 2,108)</i>	\$120 (118 - 180)	<i>\$2,202 (653 - 3,751)</i>
\$15,000 - \$29,999	62.8% (58.3 - 67.1)	\$0 (0 - 16)	<i>\$673 (182 - 1,164)</i>	\$120 (112 - 173)	<i>\$1,076 (298 - 1,854)</i>
\$30,000 - \$49,999	61.2% (57.0 - 65.2)	\$0 (0 - 3)	<i>\$2,739 (-1,101 - 6,579)</i>	\$120 (120 - 163)	<i>\$4,506 (-1,804 - 10,816)</i>
\$50,000 - \$99,999	66.3% (63.5 - 69.0)	\$12 (0 - 24)	<i>\$561 (328 - 794)</i>	\$120 (82 - 120)	<i>\$848 (498 - 1,199)</i>
\$100,000 - \$149,999	66.0% (62.2 - 69.6)	\$0 (0 - 12)	<i>\$446 (-8 - 901)</i>	\$72 (60 - 118)	<i>\$677 (-11 - 1,364)</i>
\$150,000 +	62.0% (58.3 - 65.6)	\$0 (0 - 12)	<i>\$328 (93 - 563)</i>	\$84 (60 - 120)	<i>\$531 (152 - 910)</i>
Raffles					
< \$15,000	16.0% (13.1 - 19.5)	0 (0 - 0)	<i>\$27 (9 - 45)</i>	\$60 (48 - 120)	<i>\$196 (74 - 317)</i>
\$15,000 - \$29,999	21.2% (18.2 - 24.5)	\$0 (0 - 0)	<i>\$42 (-5 - 89)</i>	\$60 (30 - 60)	<i>\$234 (-22 - 490)</i>
\$30,000 - \$49,999	29.0% (25.5 - 32.8)	\$0 (0 - 0)	<i>\$37 (15 - 58)</i>	\$60 (16 - 60)	<i>\$141 (61 - 220)</i>
\$50,000 - \$99,999	36.9% (34.2 - 39.8)	\$0 (0 - 0)	<i>\$34 (19 - 48)</i>	\$60 (34 - 60)	<i>\$96 (56 - 137)</i>
\$100,000 - \$149,999	42.1% (38.3 - 45.9)	\$0 (0 - 0)	<i>\$42 (25 - 59)</i>	\$60 (25 - 60)	<i>\$105 (64 - 146)</i>
\$150,000 +	43.5% (39.7 - 47.3)	\$0 (0 - 0)	<i>\$33 (26 - 40)</i>	\$60 (24 - 60)	<i>\$78 (62 - 94)</i>
Out-of-State Casinos					
< \$15,000	14.0% (10.8 - 18.0)	\$0 (0 - 0)	<i>\$69 (29 - 110)</i>	<i>\$110 (50 - 200)</i>	<i>\$521 (254 - 787)</i>
\$15,000 - \$29,999	17.2% (14.1 - 20.8)	\$0 (0 - 0)	<i>\$172 (3 - 341)</i>	\$186 (100 - 300)	<i>\$1,029 (55 - 2,002)</i>
\$30,000 - \$49,999	21.3% (18.0 - 24.9)	\$0 (0 - 0)	<i>\$737 (-485 - 1,958)</i>	\$100 (100 - 200)	<i>\$3,583 (-2,337 - 9,502)</i>
\$50,000 - \$99,999	26.1% (23.5 - 28.8)	\$0 (0 - 0)	<i>\$217 (126 - 307)</i>	\$100 (100 - 200)	<i>\$859 (504 - 1,214)</i>
\$100,000 - \$149,999	25.9% (22.5 - 29.5)	\$0 (0 - 0)	<i>\$277 (137 - 418)</i>	\$200 (100 - 200)	<i>\$1,077 (553 - 1,601)</i>
\$150,000 +	24.1% (20.7 - 27.8)	\$0 (0 - 0)	<i>\$200 (67 - 332)</i>	\$200 (104 - 250)	<i>\$831 (292 - 1,369)</i>

Household Income	Past Year Participation and 95% C.I.	Median Self-Reported Yearly Expenditure and 95% C.I. for Each Income Group	Mean Self-Reported Yearly Expenditure and 95% C.I. for Each Income Group	Median Self-Reported Yearly Expenditure and 95% C.I. for People who Participate	Mean Self-Reported Yearly Expenditure and 95% C.I. for People who Participate
Sports Betting					
< \$15,000	7.0% (4.5 - 10.6)	\$0 (0 - 0)	<i>\$29 (-1 - 59)</i>	<i>\$120 (0 - 510)</i>	<i>\$478 (38 - 918)</i>
\$15,000 - \$29,999	6.6% (4.6 - 9.4)	\$0 (0 - 0)	<i>\$17 (3 - 32)</i>	<i>\$120 (59 - 498)</i>	<i>\$285 (104 - 465)</i>
\$30,000 - \$49,999	9.8% (7.2 - 13.1)	\$0 (0 - 0)	<i>\$14 (6 - 33)</i>	<i>\$50 (0 - 120)</i>	<i>\$157 (-62 - 376)</i>
\$50,000 - \$99,999	14.7% (12.7 - 17.0)	\$0 (0 - 0)	<i>\$105 (4 - 207)</i>	<i>\$60 (60 - 120)</i>	<i>\$745 (40 - 1,450)</i>
\$100,000 - \$149,999	19.4% (16.4 - 22.8)	\$0 (0 - 0)	<i>\$237 (-4 - 478)</i>	<i>\$110 (60 - 175)</i>	<i>\$1,259 (24 - 2,495)</i>
\$150,000 +	22.1% (18.7 - 26.0)	\$0 (0 - 0)	<i>\$99 (27 - 171)</i>	<i>\$120 (60 - 120)</i>	<i>\$456 (132 - 781)</i>
Private Wagering					
< \$15,000	8.9% (6.2 - 12.6)	\$0 (0 - 0)	<i>\$274 (-105 - 652)</i>	<i>\$120 (60 - 169)</i>	<i>\$3,244 (-1183 - 7,670)</i>
\$15,000 - \$29,999	7.4% (5.1 - 10.5)	\$0 (0 - 0)	<i>\$60 (-21 - 142)</i>	<i>\$120 (60 - 472)</i>	<i>\$843 (-166 - 1,853)</i>
\$30,000 - \$49,999	7.4% (5.3 - 10.1)	\$0 (0 - 0)	<i>\$5 (-10 - 19)</i>	<i>\$60 (24 - 240)</i>	<i>\$74 (-143 - 290)</i>
\$50,000 - \$99,999	13.6% (11.5 - 16.1)	\$0 (0 - 0)	<i>\$39 (-11 - 89)</i>	<i>\$60 (19 - 120)</i>	<i>\$290 (-81 - 661)</i>
\$100,000 - \$149,999	14.3% (11.7 - 17.4)	\$0 (0 - 0)	<i>\$157 (-53 - 366)</i>	<i>\$120 (60 - 136)</i>	<i>\$1,117 (-318 - 2,552)</i>
\$150,000 +	18.4% (15.0 - 22.4)	\$0 (0 - 0)	<i>\$75 (32 - 118)</i>	<i>\$120 (60 - 240)</i>	<i>\$416 (189 - 642)</i>
Horse Race Betting					
< \$15,000	2.8% (1.6 - 4.9)	\$0 (0 - 0)	<i>\$8 (-2 - 19)</i>	<i>\$241 (0 - 586)</i>	<i>\$432 (-85 - 948)</i>
\$15,000 - \$29,999	1.4% (0.8 - 2.4)	\$0 (0 - 0)	<i>\$4 (0 - 9)</i>	<i>\$283 (8 - 600)</i>	<i>\$378 (110 - 647)</i>
\$30,000 - \$49,999	2.6% (1.8 - 3.8)	\$0 (0 - 0)	<i>\$17 (-1 - 34)</i>	<i>\$125 (23 - 240)</i>	<i>\$776 (18 - 1,534)</i>
\$50,000 - \$99,999	4.2% (3.1 - 5.7)	\$0 (0 - 0)	<i>\$16 (8 - 24)</i>	<i>\$120 (60 - 600)</i>	<i>\$389 (227 - 551)</i>
\$100,000 - \$149,999	4.6% (3.2 - 6.5)	\$0 (0 - 0)	<i>\$11 (1 - 20)</i>	<i>\$120 (0 - 240)</i>	<i>\$242 (49 - 435)</i>
\$150,000 +	5.8% (3.9 - 8.6)	\$0 (0 - 0)	<i>\$31 (6 - 56)</i>	<i>\$120 (0 - 240)</i>	<i>\$540 (120 - 960)</i>
Bingo					
< \$15,000	4.2% (2.6 - 6.8)	\$0 (0 - 0)	<i>\$193 (-175 - 562)</i>	<i>\$120 (62 - 180)</i>	<i>\$5,807 (-5,245 - 16,859)</i>
\$15,000 - \$29,999	6.0% (4.2 - 8.6)	\$0 (0 - 0)	<i>\$24 (13 - 35)</i>	<i>\$240 (154 - 360)</i>	<i>\$462 (285 - 640)</i>
\$30,000 - \$49,999	4.2% (2.7 - 6.5)	\$0 (0 - 0)	<i>\$21 (4 - 38)</i>	<i>\$60 (0 - 240)</i>	<i>\$566 (89 - 1,043)</i>
\$50,000 - \$99,999	3.0% (2.2 - 4.0)	\$0 (0 - 0)	<i>\$8 (4 - 11)</i>	<i>\$245 (144 - 310)</i>	<i>\$286 (198 - 373)</i>
\$100,000 - \$149,999	1.6% (0.9 - 2.9)	\$0 (0 - 0)	<i>\$4 (0 - 9)</i>	<i>\$240 (54 - 285)</i>	<i>\$273 (50 - 496)</i>
\$150,000 +	2.1% (0.8 - 5.4)	\$0 (0 - 0)	<i>\$5 (0 - 10)</i>	<i>\$11 (0 - 383)</i>	<i>\$221 (-13 - 454)</i>
Online Gambling					
< \$15,000	1.5% (0.9 - 2.7)	\$0 (0 - 0)	<i>\$8 (-2 - 18)</i>	<i>\$120 (0 - 470)</i>	<i>\$585 (-122 - 1,292)</i>
\$15,000 - \$29,999	1.9% (0.8 - 4.7)	\$0 (0 - 0)	<i>\$9 (-8 - 26)</i>	<i>\$170 (0 - 409)</i>	<i>\$494 (-423 - 1,412)</i>
\$30,000 - \$49,999	1.5% (0.8 - 2.5)	\$0 (0 - 0)	<i>\$6 (-2 - 15)</i>	<i>\$184 (61 - 1,200)</i>	<i>\$592 (-63 - 1,248)</i>
\$50,000 - \$99,999	2.0% (1.2 - 3.4)	\$0 (0 - 0)	<i>\$14 (0 - 27)</i>	<i>\$271 (45 - 1,222)</i>	<i>\$679 (18 - 1,340)</i>
\$100,000 - \$149,999	1.0% (0.5 - 2.0)	\$0 (0 - 0)	<i>\$10 (-3 - 23)</i>	<i>\$1,200 (307 - 2,334)</i>	<i>\$1,015 (160 - 1,869)</i>
\$150,000 +	3.0% (1.6 - 5.8)	\$0 (0 - 0)	<i>\$41 (-20 - 103)</i>	<i>\$60 (-18 - 223)</i>	<i>\$1,408 (-619 - 3,436)</i>

Note: Italicized figures indicate standard error >30%. Negative values denote a 'net win'.

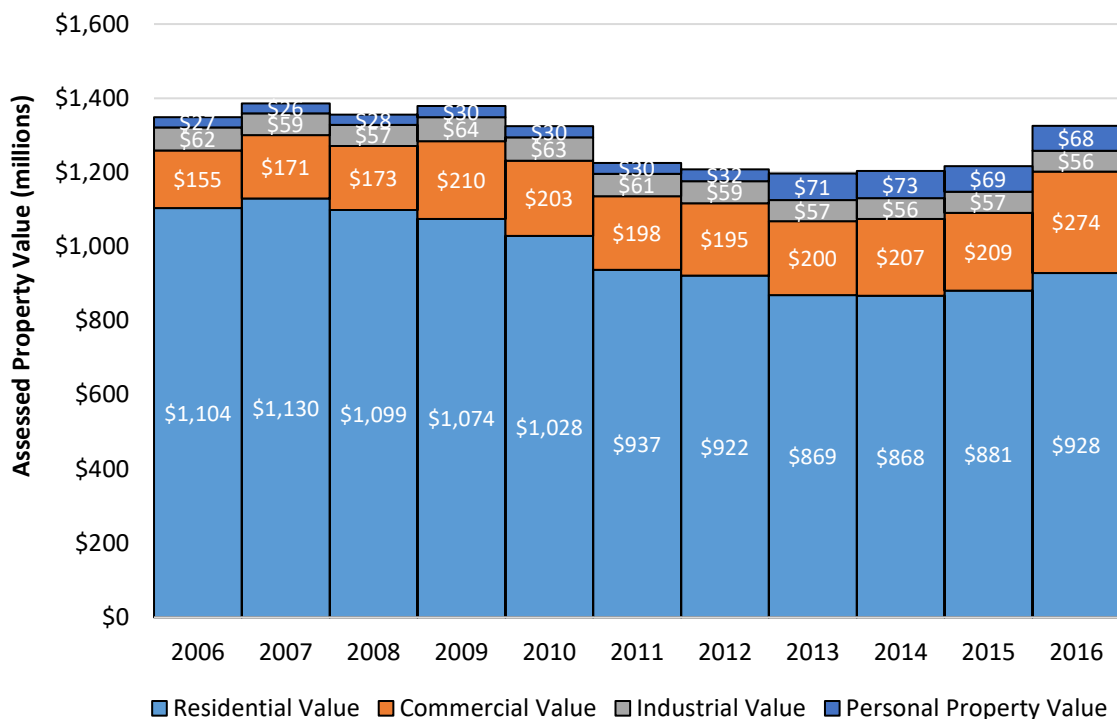
REAL ESTATE AND HOUSING

There is no theoretical reason to expect changes at a statewide level attributable to the introduction of casino gambling, thus the present analysis focuses on regional changes.

Property Values

In Figure 46, we see that total assessed value of Plainville property in FY2016 was 2% lower than in FY2006 values in real 2017 dollars, a decrease of \$23 million (Renski & Peake, 2017). As in Massachusetts as a whole, the 2008-2009 recession hit hard and property values have still not recovered from their FY2007 peak. This change has been driven mostly by the decline in residential and industrial values. From FY2006 to FY2016, Plainville's residential and industrial values have decreased by 16% and 10%, respectively, whereas commercial values increased by 77%. As seen, however, there was a sharp increase from FY2015 to FY2016, driven by a significant increase in both residential and commercial values. While this rise could be driven by the Plainridge Park Casino, the residential and commercial markets experienced considerable statewide growth as well during this period.

Figure 46. Plainville Property Assessments by Class, FY2006-FY2016 (2017 dollars, millions)

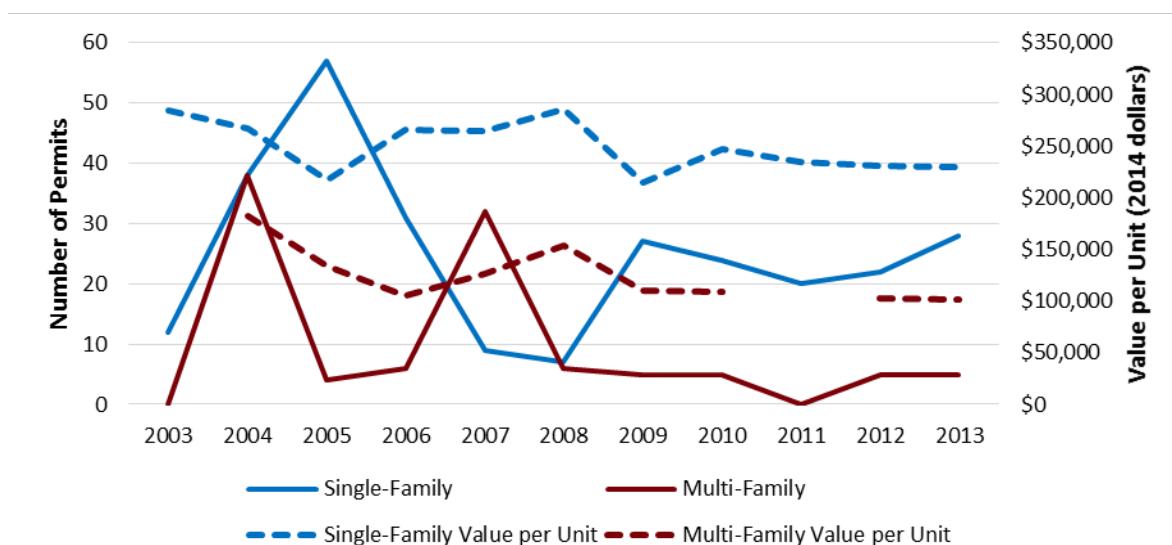


Source: MA Department of Revenue, Division of Local Services

Residential Building Permits

The number of new residential building permits and their value is another index of real estate change. The data on building permits comes from the U.S. Census Bureau's Manufacturing and Construction Division. The number of residential permits in a small community can differ greatly from year to year. We see this in the following figure, where the number of both single-family and multi-family permits oscillates widely (Renski & Peake, 2016b). The monetary value of issued permits tends to be more stable, although the small number of permits make this data highly sensitive to outliers. The average value of both single-family permits and multi-family permits has declined from 2003 to 2013. No data is currently available beyond 2013 (an update to this data is being undertaken but is not yet available).

Figure 47. Number and Per Unit Value of Residential Building Permits in Plainville, 2014 dollars



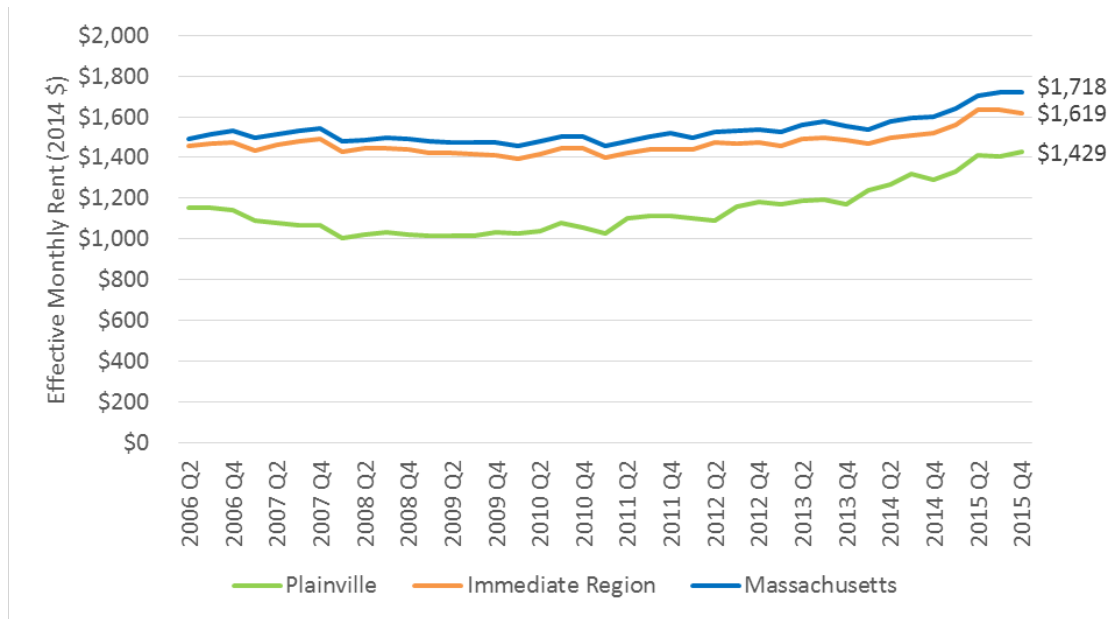
Source: U.S. Census Bureau, Residential Construction Branch

Rental Costs

Rentals are a relatively small component of the Plainville housing market with rentals making up only 23% of occupied housing units in Plainville, compared to the statewide average of 37% (Renski & Peake, 2016b, 2017). While below the state average, Plainville's rental market is comparable to other communities in the area. Among the five surrounding communities, rental shares range from a low of 16% (Wrentham) to a high of 35% (Attleboro). The majority of Plainville renters (81%) live in multi-unit structures—such as apartment buildings with more than two units.

A proprietary database by CoStar is used to track changes in the price of rental housing. Effective monthly rents in Plainville are lower than both state and regional (Bristol and Norfolk Counties) averages (Figure 48). In the fourth quarter of 2015, CoStar reported the real effective monthly Plainville rent to be \$1,429. However, since 2011, Plainville rents have been rising faster, and have narrowed the price gap with the state and region.

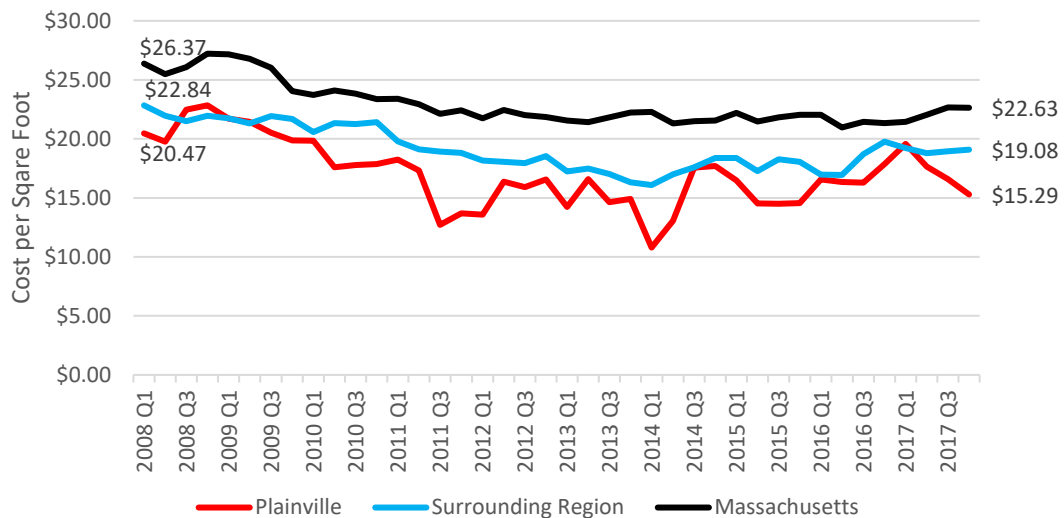
Figure 48. Effective Monthly Rents, Plainville vs. the Immediate Region and State, 2006 to 2015



Source: The CoStar Group Inc.

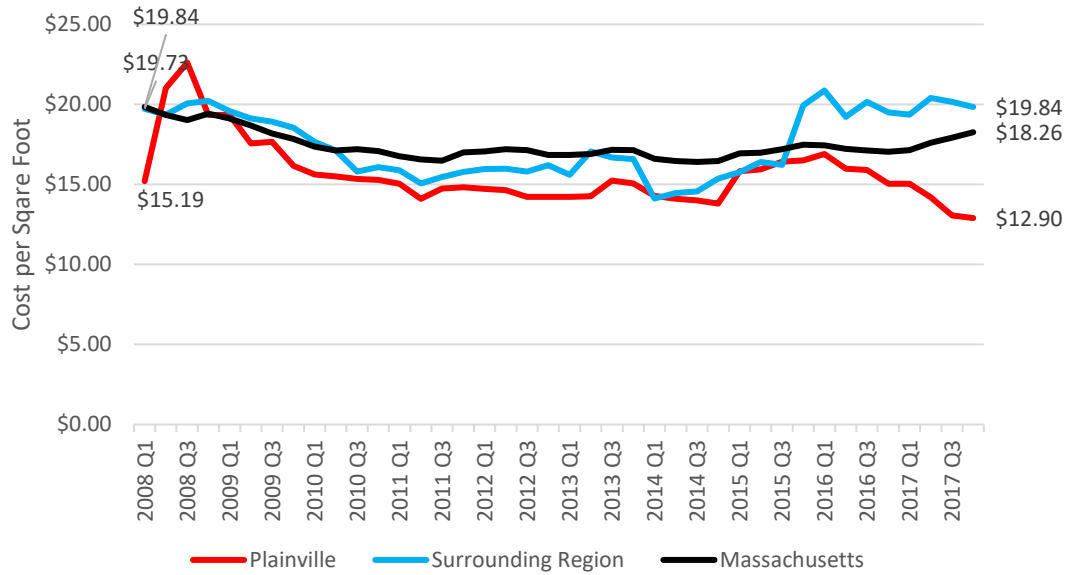
The following figures show commercial rent over time, with lease rates provided separately for industrial and commercial space, and with commercial leases subdivided into office and non-office real estate. Office real estate in Plainville leases at a lower rate than the state and the immediate region. However, lease rates for non-office commercial properties in Plainville have been roughly similar to those of Massachusetts and the surrounding region, although by the fourth quarter of 2017, the lease rate in Plainville had fallen to just over two-thirds that of Massachusetts as a whole (Figure 50). Industrial lease rates have been more similar between Plainville, the surrounding region, and the Commonwealth. Since the third quarter of 2014 industrial lease rates have actually been higher in Plainville than in the surrounding region and for the state as a whole.

Figure 49. Office Commercial Lease Rates (2017 dollars)



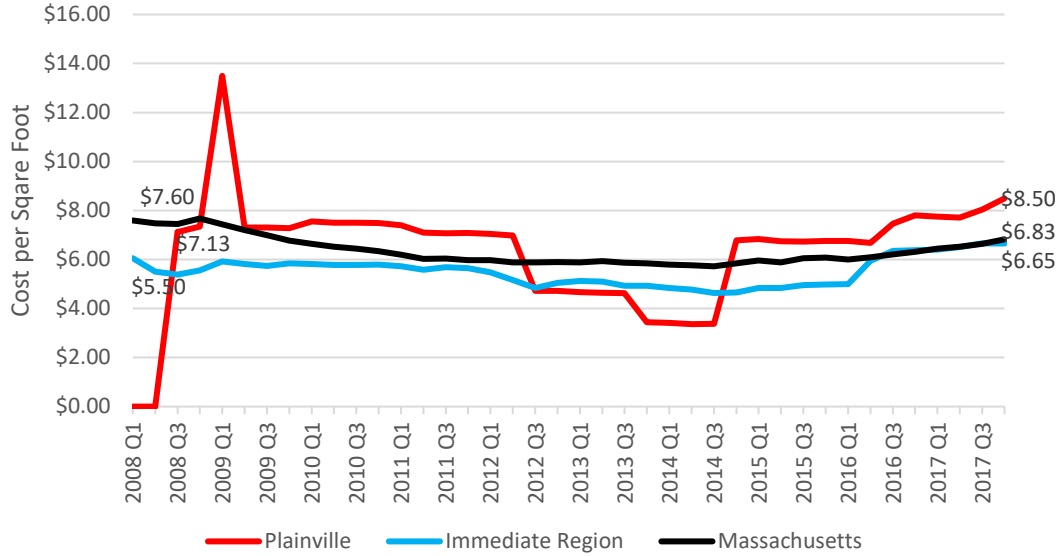
Source: The CoStar Group Inc.

Figure 50. Non-Office Commercial Lease Rates (2017 dollars)



Source: The CoStar Group Inc.

Figure 51. Industrial Lease Rates (2017 dollars)



Source: The CoStar Group Inc.

GOVERNMENT AND FISCAL

Expenditure

Statewide Impacts

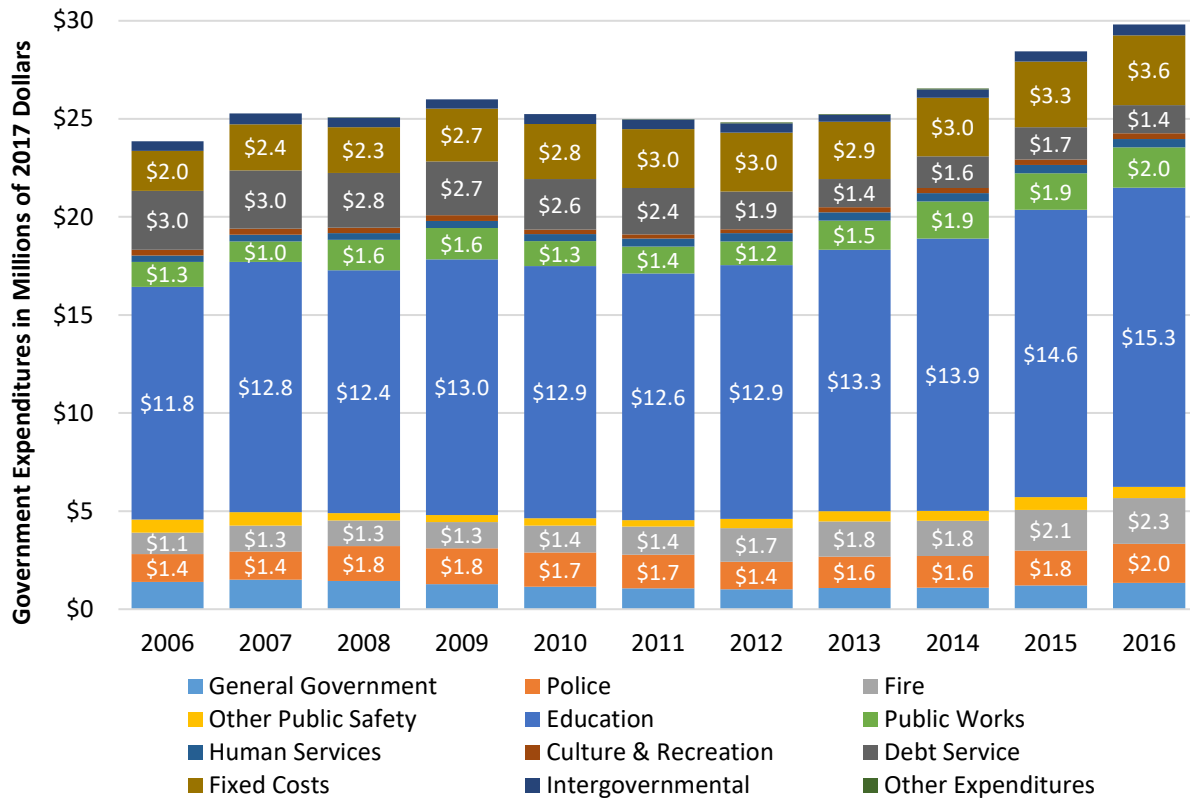
The state government provides the regulatory oversight over gambling operations. With the introduction of legal casino gambling comes expanded costs associated with ensuring that casino gambling operates according to regulation. The costs associated with this have not yet been tabulated.

Regional Impacts

Physical infrastructure upgrades for new gambling venues are occasionally financed in part or wholly by government rather than by a private developer. In these cases investment is construed as more of a ‘cost’, although this cost will be offset by the increased value/assets of these infrastructure upgrades to the community. However, *service* upgrades that are needed (police, fire services, public transportation) do not increase the physical assets of the community and the costs of these enhanced services are commonly borne by government. Furthermore, the *maintenance* of physical infrastructure (e.g., roads, utilities, sewage) is also usually a government responsibility, and a new gambling venue puts added stress on this physical infrastructure because of the increased patronage of the area.

Figure 52 shows Plainville’s operating budget from FY2006 to FY2016. Plainville’s expenditures grew 25% from \$23.9 million in FY2006 to \$29.8 million in FY2016 (in real 2017 dollars). The largest category of public spending in FY2016 was Education, followed distantly by Fixed Costs (e.g., workers’ compensation, unemployment, health insurance, retirement, etc.) and Fire. These same three spending categories were the major sources of increased public spending in the 10-year period, as well as from FY2015 to FY2016. Increased population is the likely driver of increased educational spending. The basis for the other changes are unclear at this point. Plainville did receive funding for five additional police officers to mitigate the impact of the new casino (Bruce, 2018).

Figure 52. Plainville Government Expenditures by Class, FY2006-FY2016 (2017 dollars, millions)



Source: MA Department of Revenue (DOR), Division of Local Services (DLS)

Note: CIP Tax Levy denotes Commercial, Industrial and Personal Property.

A key informant from Plainville had the following comments about operational expenses attributable to the casino:

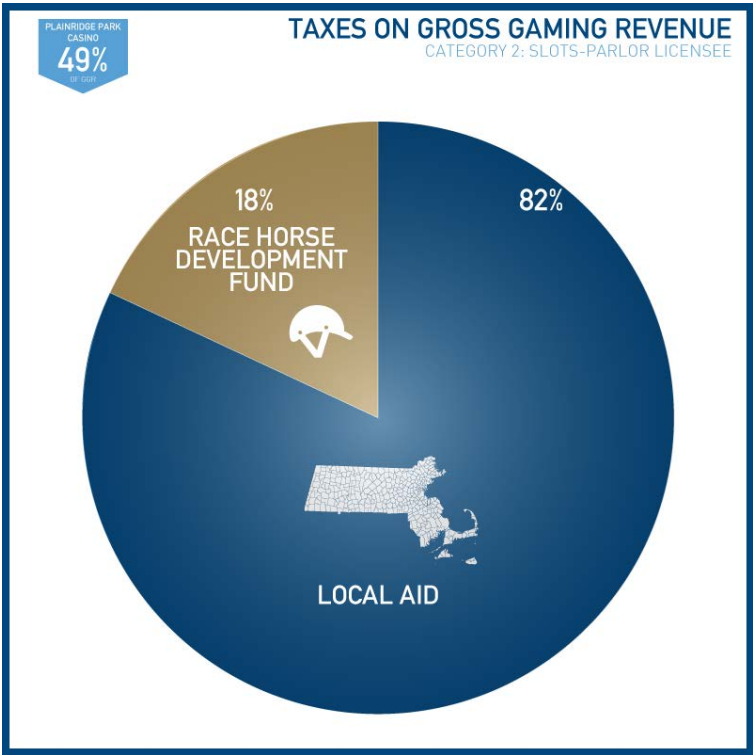
“Extra staff for police and fire were part of our host community agreement. So I would say it is right on line with what we expected and what we planned for.....Our biggest increase in call volume has been ems medical calls at the casino. And that is exactly what we expected.....Other than [police and fire], we haven’t made any major increases in the operational budget.” Jennifer Thompson, Town Administrator, Plainville, MA, January 25, 2018, 10am-11am, phone interview.

Revenue

Statewide Impacts

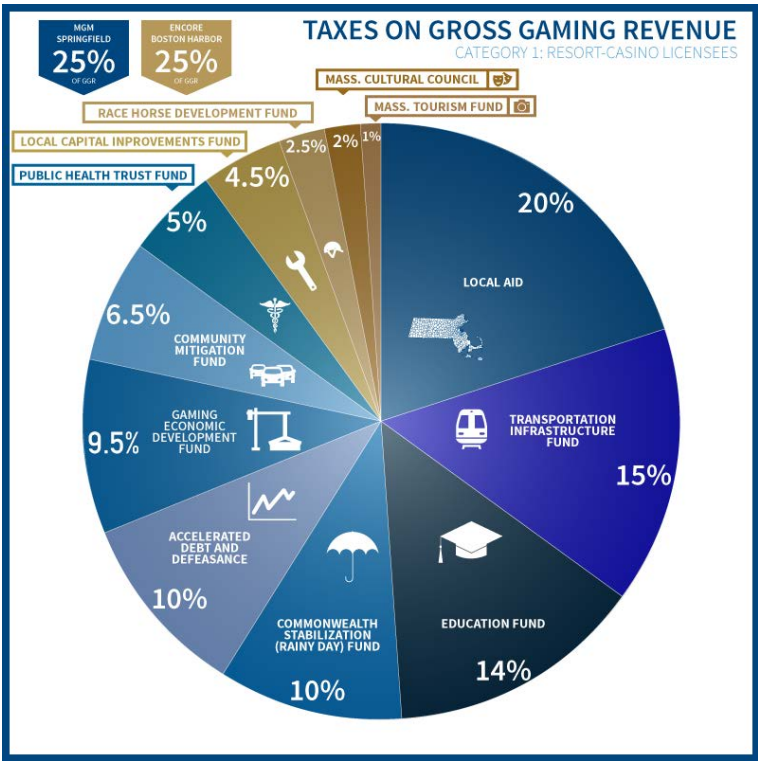
The main revenue the state receives from casino gambling is from the tax on gross gaming revenue (GGR), as well as business taxes and licensing fees. The money collected from GGR is redirected back to the 351 towns and cities in Massachusetts in the form of ‘Local Aid’ and to the Race Horse Development Fund as seen in Figure 53 for PPC and Figure 54 for MGM Springfield and Encore Boston Harbor.

Figure 53. Disbursement of Taxes on Plainridge Park Casino Gross Gaming Revenue



Source: MA Gaming Commission

Figure 54. Distribution of Taxes on MGM Springfield and Encore Boston Harbor Gross Gaming Revenue

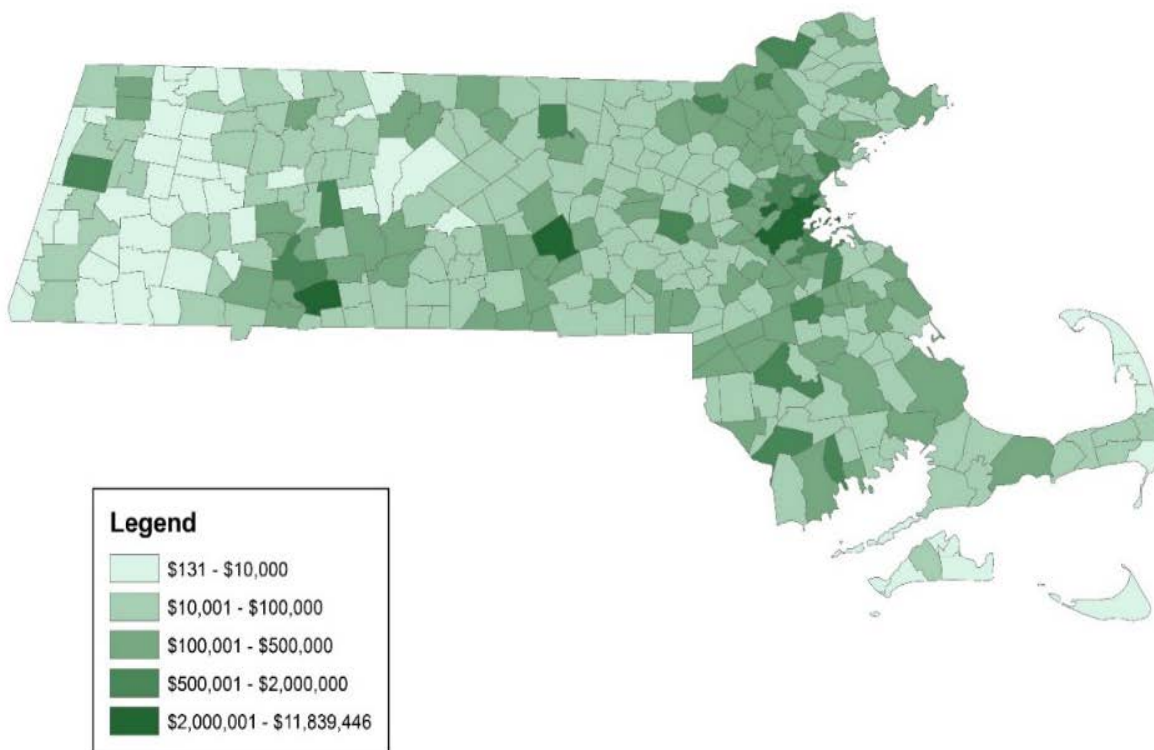


Regional Impacts

Local Aid from GGR

As reported earlier in Table 37, GGR taxes for PPC amounted to \$81.4 million in FY2016, \$77.6 million in FY2017, and \$83.3 million in FY2018, with 82% of this going to Local Aid. The formula for distribution of Local Aid is the same one used to distribute lottery revenues. It is based on a city or town's population, income, and property values. Large and economically distressed communities receive a proportionally higher share. Figure 55 shows the calculated municipal distribution of Local Aid from GGR for each municipality in Massachusetts (Peake & Motamedi, 2017).

Figure 55. Distribution of Local Aid Money from PPC Gross Gaming Revenue by City/Town in FY2016



Source: MA State Legislature, Peake & Motamedi (2017)

When aggregated into the regions used for economic modelling, it becomes clear the majority of local aid funds are distributed to the Metro Boston region. This is unsurprising given the sheer size and population density of the region, along with the fact that many of Massachusetts's more economically distressed cities and towns are within this region.

Table 60. Distribution of Local Aid from Gross Gaming Revenue by Economic Region

Region	New Local Aid (Millions of Dollars)
Metro Boston	\$39.7
Southeast MA	\$9.3
Central MA	\$7.7
Pioneer Valley	\$7.7
Cape and Islands	\$0.6
Berkshires	\$1.4
Total	\$66.4

Source: MA State Legislature, Peake & Motamedi (2017)

Plainville's Local Aid from GGR taxes on PPC (as seen in Figure 55), represents a very small amount relative to Plainville's overall revenue, which is presented in Table 61. (Note: Local Aid from GGR taxes is part of overall State Aid). Plainville revenue has been fairly flat from FY2010 to FY2016.

Table 61. Plainville Revenue by Source, 2010-2016 (2017 dollars, in millions)

Plainville	2010	2011	2012	2013	2014	2015	2016
Property Tax	\$17.8	\$17.2	\$17.1	\$17.6	\$16.5	\$17.3	\$18.1
State Aid	\$5.6	\$5.1	\$4.9	\$4.5	\$4.7	\$4.5	\$4.4
Local Receipts	\$5.4	\$5.1	\$5.2	\$5.1	\$5.0	\$5.0	\$4.8
All Other	\$1.2	\$0.8	\$1.8	\$1.6	\$1.7	\$1.6	\$1.6
Total	\$30.0	\$28.2	\$29.1	\$28.9	\$27.8	\$28.4	\$28.9

Source: MA Department of Revenue, Division of Local Services. Note: Local Receipts represent revenue from things such as motor vehicle excise fees and taxes collected from hotels and motels.

Host and Surrounding Community Agreements

A much larger source of revenue for the Town of Plainville is from the [Host Community Agreement](#) they have with PPC. This consists of \$1.5 million in annual property taxes that increases by 2.5% per year; \$100,000 annually as a Community Impact Fee; \$2.7 million annually for the first five years of operation (changing to 1.5% of PPC GGR in the 6th to 10th year of operation and 2.0% of PPC GGR in the 11th and following years), and all building permit fees which are estimated to be \$816,000.

Three key informants from Plainville all had positive things about the revenue the town received from PPC:

"They are our largest tax payer by a lot. They pay 7.9 percent of our taxes in the town of Plainville. The next largest tax payer pays 2.9 percent of our taxes.....We have a great bond rating, we had an upgrade in April.[Moody's] had an awful lot of interest in our host community fee....They know that it is a big deal. To have a dedicated revenue stream that is identifiable and quantifiableWe got a great rate, we paid cash, 2.5 million dollars cash from that fund and issued a bond of 30 million.....I think the way this host community agreement was developed, the two pronged approach to it was genius.....225,000 dollars a month is sent to the town treasurer.....This money is dedicated to capital projects or land acquisitions. Period and amen. It cannot be used for operating budget.....We are not going to have to borrow for dump trucks and police radios and a radio tower and those types of things. We are going to be able to pay cash for them. If you couldn't pay cash for them that obviously takes away from operating budgets." Kathleen Parker, Treasurer of Plainville, MA, February 1, 2018, 11-12pm, 2018, phone interview.

"It is the only town hall and public safety building in Massachusetts where not a penny of tax dollars had to be used, which is amazing. The residents were thrilled....The host community agreement, we have only used for capital projects. We used it twice. Once to buy an open space parcel....so it has preserved 103 acres of open space in Plainville and the second one is the town hall and the public safety building."

Jennifer Thompson, Town Administrator, Plainville, MA, January 25, 2018, 10am-11am, phone interview.

"We have not been able to invest heavily into the infrastructure of this town for quite some time and this tool has allowed us to that without burdening the people of the town with additional taxes." Lou LeBlanc, Chairman of the Board of Health, Plainville, MA, March 1, 2018, 5-6pm, phone interview.

Springfield and Everett also have host agreements with the casino in their community which confers significant financial benefits. Similarly, the 'surrounding communities' also have analogous [Surrounding Community Agreements](#).

It is uncertain at this point whether the municipal revenue from host and surrounding community agreements, local taxes on the casino, and Local Aid fully offset the increased municipal infrastructure costs caused by the casino as well as the casino expenditure of local residents (which is generally proportionately higher than for people at a greater distance from the casino).

SUMMARY OF SOCIOECONOMIC IMPACTS IN 2018

SOCIAL AND HEALTH IMPACTS

Problem Gambling & Related Indices

At a statewide level there is no compelling evidence that the prevalence of problem gambling or indices related to problem gambling (treatment seeking, bankruptcy, divorce/separation, suicides) have increased since PPC opened in 2015. There will be more direct evidence on this issue after the next large-scale population prevalence survey in 2020. At this point, the evidence for a lack of change consists of the following:

- Within the Massachusetts Gambling Impact Cohort (MAGIC), from 2015 to 2016 there has been no significant change in the proportion of problem gamblers within the cohort who wanted or sought help for gambling problems. There has also been no significant change within the cohort in reports of financial problems, work/school problems, relationship problems or child/family neglect attributable to gambling.
- Problem gambling treatment intakes reported to the Department of Public Health have continued to decline subsequent to 2015.
- The number of calls to the Massachusetts Council on Compulsive Gambling (MCCG) helpline has declined since its peak in 1998, although there may have been a slight increase in calls from 2015 to 2017. There has been a marked increase in the number of visits to the help pages of the MCCG website from 2014 to 2016.
- There has been no increase in statewide personal bankruptcy filings.
- There has been no increase in statewide divorces, restraining orders, and cases of child welfare involvement.

There is more direct evidence on this issue at a regional level, as representative cross-sectional Targeted Population Surveys have been conducted in the Host and Surrounding Communities (H&SC) for the PPC in 2014 (one year prior to opening) and again in 2016/2017. Here again, the evidence leads us to conclude that no significant changes in problem gambling or related indices have likely occurred in the PPC H&SC. This is likely due to the fairly high level of casino gambling (23.2%) that existed in the region prior to the introduction of the PPC, combined with the close proximity of Rhode Island and Connecticut casinos that have been in operation since the early 1990s. The evidence for an absence of change in problem gambling and related indices consists of the following:

- No significant change was found in the prevalence of problem gambling or at-risk gambling in the Targeted Population Surveys of the PPC H&SC from Baseline (2014) to Follow-Up (2016/2017). Furthermore, these population surveys detected no increase in the number of problem gamblers wanting or seeking help for problem gambling; or the number of regular gamblers reporting financial problems, filing for bankruptcy, or work/school problems because of gambling; reporting an increase in relationship or family-related problems (divorce, separation, domestic violence, child neglect, child welfare involvement) due to gambling; or reporting suicidal ideation because of gambling.
- There has been no reported change in the number of Gamblers Anonymous meetings in the Plainville area or the number of people attending these meetings.
- Key informants in the Town of Plainville report no obvious impact of PPC on problem gambling.
- There has been no change in the number of personal bankruptcy filings in Norfolk County, where the Town of Plainville is situated.

- There have been no changes in the number of divorce filings, restraining orders, and cases of child welfare involvement in Norfolk County.

Crime

At a statewide level there is no evidence that the introduction of casino gambling has had any impact on crime rates. The basis for this conclusion consists of the following:

- There has been no increase in the number of violent crimes, property crimes, or overall crimes occurring in Massachusetts subsequent to 2015 (with property crime actually decreasing since 2015).
- There has been no change in the number of illegal gambling offenses in the state (which were very low to begin with).
- Within the MAGIC cohort, from 2015 to 2016 there has been no significant change in the number of individuals indicating they have committed illegal acts due to gambling or who report gambling at an 'underground' casino, slot parlor, or card room.

At a regional level, there has been no significant increase in overall crime in the PPC H&SC. However, there has been an increase in credit card fraud as well as an increase in reports of lost property, reports of suspicious activity, and traffic complaints in the Town of Plainville that can likely be attributed to the PPC. These increases, in turn, are likely largely attributable to an increased volume of visitors to the area. The basis for these conclusions consists of the following:

- Plainville police statistics show an increase in property crimes and total crimes at PPC in the two years after it became a casino compared to the prior two years when it was solely a racetrack.
- Despite an increase in crime at PPC, there has been no significant change in the overall annual number of property, violent, or total crimes recorded by police in the Town of Plainville from 2010-2015 compared to 2016-2017 (these numbers being inclusive of PPC crimes). However, 7 out of 46 individual types of crime and calls for service did significantly increase, whereas one significantly decreased. An examination of the original written police reports suggests that credit card fraud, lost property reports, reports of suspicious activity, and traffic complaints are the only incidents that can likely be attributed to the presence of the casino.
- In the PPC H&SC the collective local police force statistics show a significant decrease in the overall annual number of property and total crimes from 2010-2015 compared to 2016-2017, but no change in violent crimes. However, 6 out of 46 individual types of crime and calls for service did significantly increase and 2 out of 46 significantly decreased. Examination of the original written police reports as well as comparisons with control communities suggests that credit card fraud is the only activity that has likely increased as a result of the casino.
- There has been no significant change in the number of people in the Targeted Population Surveys of the PPC H&SC who report their gambling has caused them to commit an illegal act or be arrested in the 2014 Baseline Survey compared to the 2016/2017 Follow-Up Survey.
- There has been no change in the recorded number of illegal gambling offenses in the Town of Plainville, which were negligible even prior to PPC opening.

Attitudes

At a statewide level there may be some change in attitudes toward gambling. The basis for this conclusion consists of the following:

- Within the MAGIC cohort there have been significant changes in three of the four attitudes assessed from 2015 to 2016. More specifically, there was a) a decrease in the percentage of people who believe that all

forms of gambling should be legal and a corresponding increase in the percentage who believe that certain types should be legal and certain types illegal; b) a decrease in the percentage of people who think that gambling is not available enough, with a corresponding increase in the percentage who believe that the current availability is fine; and c) a decrease in the percentage of people who think that the benefits of gambling are equal to the harms, which is associated with a general trend toward more people believing that the harms outweigh the benefits. There was no change in the belief that gambling is morally wrong from 2015 to 2016 (with only a small minority of people endorsing this belief each time).

At a regional level there is also evidence of a significant change of attitudes toward gambling in the PPC H&SC. The basis for this conclusion is the following:

- In the 2014 versus 2016/2017 Targeted Population Surveys of the PPC H&SC there was a significant a) decrease in the percentage of people who indicated that gambling is not available enough and a corresponding increase in the percentage of people who believed the current availability of gambling is fine; b) decrease in the percentage of people who believe that casinos will be beneficial to Massachusetts and a corresponding increase in the percentage of people who believe they will be neither beneficial or harmful; and c) increase in the percentage of people who believe the new casino in their community will be neither beneficial or harmful to their community. There was no significant change found in people's opinion concerning whether all, some, or no types of gambling should be legal; whether gambling was morally wrong; and the perceived benefit or harm of gambling to society.
- Key informants in the Town of Plainville indicated that Plainville residents had very positive attitudes toward the introduction and impact of PPC.

Population Health & Leisure

At a statewide level, there is no evidence of any significant change in population health that could be attributed to the introduction of casino gambling, but there may be some evidence of an increase in overall gambling involvement as a leisure activity. The basis for this conclusion consists of the following:

- Within the MAGIC cohort there was no significant change between 2015 and 2016 in self-rated general health, health-related gambling problems, the number of people seeking help for their use of alcohol or drugs, or the number of people who reported having a behavioral addiction (overeating, sex, shopping, exercise, etc.). There was a significant decrease in both overall happiness as well as overall stress, but no logical reason to attribute either of these changes to the introduction of casino gambling.
- There has been no marked change in the percentage of Massachusetts adults consuming alcohol in the past 30 days from 2014 to 2015 or 2016 as assessed by the Behavioral Risk Factor Surveillance System.
- Within the MAGIC cohort, overall participation rates in gambling have significantly increased from 2015 to 2016 as has the number of gambling formats engaged in, but overall frequency of gambling has not changed and overall expenditure has declined. There was no significant change in the rated importance of gambling as a recreational activity.
- The American Time Use Survey shows no obvious change in the self-reported amount of time people spend at gambling establishments from 2014 to 2015 or 2016.

At a regional level there is no evidence of any significant change in population health or gambling as a leisure activity. This conclusion is based on the following:

- There was no significant change in the 2014 versus 2016/2017 Targeted Population Surveys of the PPC H&SC in self-rated general health, health-related gambling problems, happiness, stress, number of people who reported seeking help for their use of alcohol or drugs, or the number of people reporting having a behavioral addiction (overeating, sex, shopping, exercise, etc.).

- There was also no change in the 2014 versus 2016/2017 Targeted Population Surveys of the PPC H&SC in overall participation rates in gambling, the number of gambling formats engaged in, gambling expenditure, frequency of gambling, or the rated importance of gambling as a leisure activity.
- Key informants from Plainville noted that PPC provided additional music and entertainment options to the local community.

Demographics

At a statewide level there is no theoretical reason to expect any changes to date due to casino introduction.

At a regional level there is no evidence of any change in demographics in the PPC H&SC. This conclusion is based on the following:

- While the Town of Plainville's population has increased faster than in other areas of the state, this trend was evident for several years prior to PPC. Also, The PPC Employee Survey found that only 75 employees of PPC reported moving to take their job, with only 13 of these individuals moving to Plainville.
- There are no obvious changes in the percentage of elementary and secondary students in Plainville with English as a second language, being an English language learner, or having a disability.
- Plainville key informants report no influx of new students to the school system.

Environment

Traffic and noise are the environmental attributes of focus in this study. There is no theoretical reason to currently expect changes in these variables at a statewide level.

At a regional level there is evidence of some increase in traffic and noise in some of the casino locations, but no compelling evidence of an increase in traffic accidents or traffic fatalities. The basis for this conclusion consists of the following:

- While traffic fatalities have increased slightly in association with casino construction and operation, attribution to the casino(s) is weak because of the 2016 increase in the state as a whole, the fact that the increase in fatalities is for the entire county, and because of the absence of any traffic fatalities in the Town of Plainville.
- Between 2014 and 2016 there has been a 1.4% increase in traffic volume in Springfield, a 9% increase in Plainville, and a 17% increase in Everett.
- Between 2010-2015 compared to 2016-2017 there was a 5.4% increase in traffic collisions in Plainville and a 40.3% increase in traffic complaints. For the PPC H&SC there was an 8.5% increase in traffic collisions and a 15.0% increase in traffic complaints.
- Key informants from Plainville report no increase in traffic problems related to the new casino.
- The Plainville Board of Health received noise complaints during construction of PPC, but not during its operation.

ECONOMIC AND FISCAL IMPACTS

Direct Casino Expenditure and Revenue

The building and operation of PPC has had several clear positive economic impacts:

- \$150.2 million was spent building PPC, with the large majority of this money coming from Penn National Gaming and 86.7% of this money being spent within Massachusetts.
 - \$13.3 million was spent on architectural and engineering services from 2010 to 2014. Roughly 99% was spent within Massachusetts, with \$6.7 million going to the Metro Boston region and \$6.0 million going to Bristol and Norfolk Counties.
 - \$115.4 million was spent on building and renovating the actual building structure, with the largest categories being construction (\$91.9 million) and insurance and bonds (\$15.1 million). A total of 85.6% of this money was spent in Massachusetts, with two-thirds of the overall economic activity generated by this construction occurring in Bristol and Norfolk Counties.
 - \$21.5 million was spent on wages for people involved in the construction, with 84.6% being paid to residents of Massachusetts. The number of people on the construction payroll averaged 554 across all quarters of the construction period, with 81.4% of these people being from Massachusetts and the large majority of construction jobs being for people resident in Bristol and Norfolk Counties.
- Total operating revenue from PPC (inclusive of horse racing, lottery sales, and non-gambling revenue) was approximately \$104.1 million in calendar 2015, \$176.0 million in calendar 2016, and is estimated to be approximately \$185.7 million in 2017. Gambling constitutes 95% of all operating revenue and slot machines and electronic table games account for 90% of all gambling revenue. An additional \$4.0 million is estimated to have been spent by patrons in 2016 on food, retail shopping, and other amenities in the local area as part of their visit to the casino.
 - The Plainridge Park Casino Patron Survey established that 11.4% of PPC patrons are from the Host and Surrounding Communities, 66.5% are from other parts of Massachusetts, 19.2% are from out-of-state, and 2.9% have an unknown geographic origin. The largest source of PPC revenue is thought to be 'recaptured revenue' from Massachusetts residents who would have gambled out-of-state if not for the presence of PPC. However, the exact amount and proportion is uncertain due to conflicting data. What is clear is that approximately 20.8% of total revenue at PPC is potentially 'new' money to the state from out-of-state patrons. Another 21.2% is estimated to be money from Massachusetts residents that has been 'reallocated' from other economic sectors within Massachusetts.
- \$129.5 million was incurred in operational expenses in PPC's first year of operation, with 87.0% of this money being spent within Massachusetts.
 - \$81.4 million was paid in gross gaming tax to the state of Massachusetts
 - \$30.3 million was paid to a range of private sector vendors as well as local, state, and federal governments. A total of 63.2% of this money was paid to vendors and governments within Massachusetts.
 - \$17.8 million was spent on employee wages in the first year of operation, with 35.0% going to employees from Southeastern Massachusetts, 28.6% going to Metro Boston region employees, and 31.7% going to out-of-state employees.
 - Data provided by Plainridge Park Casino established that 893 people were hired in the first year (64.2% full-time employees) with 40.8% being from Southeastern Massachusetts, 25.6% from Metro Boston, and 28.7% being from out-of-state. Only 75 people moved to take their employment, with 13 of these moving to Plainville. There has been significant employee turnover, as only 512-570 people have been employed at any given time, with 512 being employed as of June 2016.

Importantly, a significant portion of these casino jobs are 'new' jobs, as 15.5% of people were unemployed and 34.7% were employed part-time prior to being hired.

- The amount of annual net profit for Penn National Gaming (i.e., after operating expenses) and percentage of this net profit that stays in Massachusetts has not been determined. Nonetheless, it constitutes the minority of the overall revenue and even if none of this money stays in Massachusetts it is clear that PPC has resulted in a significant economic gain for the State of Massachusetts.

The building of MGM Springfield and Encore Boston Harbor Casino are also having clear positive economic impacts as MGM Resorts International and Wynn Resorts are spending a considerable amount of money in the state building these facilities and employing a large local workforce in the construction. However, the precise economic impacts are not currently available and will be detailed in future reports.

Business Establishments

At a statewide level, there is no theoretical reason to expect changes in the number of business establishments or the mix of business establishments due to the introduction of PPC. There is some reason to potentially expect impacts on other gambling industries, and some changes have been observed. However, not all of these changes are likely attributable to PPC. The evidence for this latter conclusion is the following:

- Within the MAGIC cohort, there were significant increases in past year participation from 2015 to 2016 in traditional lotteries, instant lotteries, daily lottery games, bingo, and online gambling, and a significant decrease in out-of-state casino patronage and horse race betting. However, questionnaire changes are likely responsible for the increase in online gambling as well as daily lottery games, whereas a large Powerball prize in 2016 is likely responsible for the increase in traditional lotteries.
- The decrease in out-of-state casino patronage is likely 'real', attributable to having a new MA-based casino.
- The decrease in horse race betting participation is also likely real, but horse race betting has also been in decline for many years prior to PPC. That being said, overall amount wagered on horse racing in MA increased in 2016, potentially attributable to increased prize money available from the Race Horse Development Fund.
- While charitable gambling revenue continues to slowly decline over time, it actually increased by \$1.6 million from 2015 to 2016 (consistent with the report of increased overall participation).
- Lottery sales only declined by 1% from FY2015 to FY2017, which is within the natural -6% to +7% year-to-year variation. Of the 21.2% of PPC patrons who reported spending less on other things because of their gambling at Plainridge Park Casino, only 25% reported spending less on lottery products. This is potentially offset by Plainridge Park having had a 26% increase in lottery sales on the premises since becoming Plainridge Park Casino.

At a regional level there is no strong evidence that the overall number of businesses has significantly changed as a direct result of the new casinos or that the construction and/or operation of these casinos has differentially impacted certain types of businesses. However, there has been some rejuvenation of racing at Plainridge Racecourse. This conclusion is based on the following observations:

- The number of businesses in Plainville and Norfolk County in the three years of construction and operation (2014-2016) relative to the two prior years (2012-2013) has increased at a lower rate than the state as a whole during this same time period. The number of businesses in Springfield and Hampden County in the two years of construction (2015-2016) relative to the two prior years (2013-2014) is higher than the state during this same time period. The number of businesses in Everett in the one year of construction (2016) relative to the two prior years (2014-2015) is higher than the state during this same time period, but it is lower for Middlesex County.

- The number of business bankruptcies in each county is very small relative to the total number of businesses. There are no strong trend in these bankruptcies over time that allow them to be attributed to the casinos, especially when considering the natural year-to-year variation in the data.
- There are several notable increases in the percentage of businesses in each industry sector, with these increases being most common in Norfolk County. While it is possible that some of these changes are related to the new casinos, it is clear that some of these increases reflect statewide changes, some of the increases reflect population increases, and some of these increases are logically unrelated to casino introduction.
- Key informants from Plainville report an increase in the number of businesses and a positive impact on restaurants.
- There was no significant change in population participation estimates in any type of gambling in the Plainville Baseline Targeted Population Survey in 2014 compared to the Follow-Up Survey of 2016/2017, with the exception of private betting, which significantly declined.
- Plainville Racecourse has seen a significant increase in the number of races since 2014 and some stabilization of overall amount wagered, likely attributable to the funds received from the Race Horse Development Fund.
- While there have been revenue declines in charitable gambling from 2014 to 2016, the decline is smaller in Norfolk country relative to Hampden and Middlesex Counties (without casinos).

Employment

At a statewide level there is no theoretical reason to currently expect significant changes in levels of employment, labor force participation, or unemployment due to the introduction of casino gambling.

At a regional level there is evidence of an increase in employment numbers in the Town of Plainville that is attributable to the new casino. The evidence for this consists of the following:

- Plainville's 372 businesses employed 4,614 people in 2016, an increase of 17.3% since 2014. This compares to employment growth of 4.0% in the state and 3.2% Norfolk and Bristol Counties from 2014 to 2016.
- PPC created 500+ jobs, with 25.6% of these being filled by people residing in the region of the state in which Plainville is located.
- When comparing employment numbers in Plainville from 2012-2013 to 2014-2016, one of the largest increases was in the construction sector, which is plausibly related to the building of the casino and is consistent with the increased employment reported by PPC related to construction.
- Key informants from Plainville report increased local employment due to PPC.

Personal Income

At a statewide level there is no theoretical reason to expect significant changes in wages or poverty rates due to the introduction of casino gambling. There is reason (and evidence) to anticipate that gambling may be somewhat regressive, but no evidence concerning whether the introduction of casino gambling has increased or decreased this tendency.

At a regional level, it is possible that the slight increase in wages and slight decrease in poverty rate in Plainville are attributable to the new casino, but this is uncertain:

- Plainville experienced a larger increase in average wage from 2013/2014 to 2016 (8.2%) than either the immediate region (3.4%) or the state (4.8%), and a larger increase (37.9%) from 2009 to 2016 than any of the Surrounding Communities.

- While the poverty rate increased slightly in both Norfolk County and Massachusetts in the five years from 2008-2012 relative to 2012-2016, it decreased in Plainville, and the 3.6% current rate in Plainville is significantly lower than both Norfolk County and the state.

Real Estate and Housing

At a statewide level there is no theoretical reason to expect significant changes in real estate property values, residential building permits, or rental costs due to the introduction of casino gambling.

At a regional level it is possible that property values have increased in Plainville partly attributable to the casino, but unlikely that the casino has had an impact on commercial or industrial lease rates. The evidence for this consists of the following:

- After years of decline and/or stable values, there was an increase in property assessment value in FY2016, driven primarily by an increase in residential and commercial values.
- Office and non-office commercial lease rates have continued to be below rates in the surrounding region and the state. While industrial lease rates are higher in Plainville than in surrounding communities, these rates were historically higher prior to 2012 as well.

Government and Fiscal

At a statewide level, some new expenses are incurred in regulating casino gambling that is offset by the revenue from casino business taxes and licensing fees. The precise dollar amounts have not yet been tabulated.

At a regional level there are some increased infrastructure costs in the communities hosting the new casinos. While the Town of Plainville has experienced increased government expenditures coincident with the introduction of PPC, the main driver of these increased costs has been the increase in population. In terms of revenue, each of the 351 towns and cities in Massachusetts receives money (Local Aid) from a tax on casino slot machine and table game revenue, with these amounts being proportional to population size and economic disadvantage. Much more important to the Host and Surrounding Communities are the individual agreements each have with the local casino that confers significant financial transfers to the community. It is uncertain at this point whether municipal revenue from host and surround community agreements, local taxes on the casino, and Local Aid fully offsets the increased municipal infrastructure costs caused by the casino as well as the casino spending of local residents.

REFERENCES

- Abt, V., Smith, J.F. & Christiansen, E.M. (1985). *The Business of Risk: Commercial Gambling in Mainstream America*. Lawrence, KS: University Press of Kansas.
- Anderson, A. (1997). *Economic Impacts of Casino Gaming in the United States*. Washington, D.C.: American Gaming Association.
- Anielski, M. & Braaten, A. (2008). *The Socio-Economic Impact of Gambling (SEIG) Framework: An Assessment Framework for Canada: In Search of the Gold Standard*. Anielski Management. Edmonton, Alberta. February 2008.
- Anielski, M. & Wynne, H. (2009). *Socio-Economic Impact Study of Gambling in Nova Scotia*. Anielski Management. Edmonton, Alberta. June 22, 2009.
- Atkinson, G. (2000). Re-thinking economic progress. *World Economics*, 1 (1), January-March 2000. 153-166.
- Australia Productivity Commission (1999). *Australia's Gambling Industries Inquiry Report*. Melbourne: Productivity Commission.
- BRFSS (2015). BRFSS Prevalence and Trends Data. <https://www.cdc.gov/brfss/brfssprevalence/>
- Bruce, C.W. (2018). *Assessing the Impact of Gambling on Public Safety in Massachusetts Cities and Towns*. January 14, 2018. <https://massgaming.com/wp-content/uploads/Assessing-the-Impact-of-Gambling-on-Public-Safety-in-Massachusetts-Cities-and-Towns-3-1-18.pdf>
- Cambridge Health Alliance (2017). *Massachusetts Voluntary Self Exclusion Study*. Presentation to the Public Health Trust Fund Executive Committee. October 4, 2017.
- Centers for Disease Control and Prevention (CDC) (2015). Suicide: Facts at a Glance 2015. <https://www.cdc.gov/violenceprevention/pdf/suicide-datasheet-a.pdf>
- Centre for Social and Health Outcomes Research and Evaluation & Te Ropu Whariki (2008). *Assessment of the Social Impacts of Gambling in New Zealand. Report to Ministry of Health*. Auckland, New Zealand: Centre for Social and Health Outcomes Research and Evaluation & Te Ropu Whariki, Massey University.
- Center for Health Information and Analysis (CHIA) (2018). *Total Health Care Expenditures from the 2018 Annual Report*. <http://www.chiamass.gov/total-health-care-expenditures/>
- Christiansen Capital Advisors (2017). *Rhode Island Gaming and State Revenue Forecast*. October 31, 2017. <http://www.dor.ri.gov/documents/Reports/2017RIGamingForecast.pdf>
- Collins, D. & Lapsley, H. (2003). The social costs and benefits of gambling: An introduction to the economic issues. *Journal of Gambling Studies*, 19(2), 123-148.

Committee on the Social and Economic Impact of Pathological Gambling, Committee on Law and Justice, Commission on Behavioral and Social Sciences and Education and National Research Council (1999). *Pathological Gambling: A Critical Review*. Washington, D.C.: National Academy Press.

Connecticut Department of Consumer Protection (2018). *Gaming Revenue and Statistics*. <http://www.portal.ct.gov/DCP/Gaming-Division/Gaming/Gaming-Revenue-and-Statistics>

Culin, S. (1907). *Games of the North American Indians*. New York: Dover.

Daly, H.E. & Cobb, J.B. (1989). *For the Common Good: Redirecting the Economy toward Community, the Environment and a Sustainable Future*. Boston: Beacon Press.

Dasgupta, P. & K.G. Mäler (2000). Net national product, wealth, and social well-being. *Environment and Development Economics*, 5(1-2), 69-93.

Eadington, W.R. (1998). Contributions of casino-style gambling to local economies. *Annals of the American Academy of Political and Social Science*, 556, 53-65.

Eadington, W.R. (2003). Measuring costs from permitted gaming: Concepts and categories in evaluating gambling's consequences. *Journal of Gambling Studies*, 19(2), 185-213.

Federal Bureau of Investigation (FBI) (2018). Uniform Crime Reporting. <https://ucr.fbi.gov/crime-in-the-u.s>

Ferris, J. & Wynne, H. (2001). *The Canadian Problem Gambling Index: Final Report*. Submitted to the Canadian Centre on Substance Abuse. February 19, 2001.

Findlay, J.M. (1986). *People of Chance. Gambling in American Society from Jamestown to Las Vegas*.

Gazel, R. (1998). The economic impacts of casino gambling at the state and local levels. *The Annals of the American Academy of Political and Social Science*, 556, 66-84.

General Court of Massachusetts (1934a). <http://archives.lib.state.ma.us/handle/2452/291391>

General Court of Massachusetts (1934b). <http://archives.lib.state.ma.us/actsResolves/1934/1934acts0371.pdf>

General Court of Massachusetts (1969). <http://archives.lib.state.ma.us/actsResolves/1969/1969acts0810.pdf>

Gerstein, D.R., Volberg, R.A., Harwood, H.J. & Christiansen, E.M. (2004). Assessing the costs of 'addicted' gamblers. *Managerial & Decision Economics*, 25(4), 201-203.

Grinols, E.L. (2004). *Gambling in America: Costs and Benefits*. Cambridge, UK: Cambridge University Press.

Grinols, E.L. (2007). Social and economic impacts of gambling. In *Research and Measurement Issues in Gambling Studies*. Smith, G., D. Hodgins and R.J. Williams (eds). Boston, MA, Academic Press, 515-539.

Grinols, E.L. & Mustard, D.B. (2001). Business profitability vs. social profitability: Evaluating the social contribution of industries with externalities and the case of the casino industry. *Managerial and Decision Economics*, 22(1-3), 143-162.

- Grinols, E.L & Omorov, J.D. (1996). Development of dreamfield delusions: Assessing casino gambling's costs and benefits. *Journal of Law and Commerce*, 16, 49-87.
- Hawke, A. (2000). *Measuring the Impact of Gambling: An Economist's View*. Hawke Institute Working Paper Series No. 4. Magill, South Australia: Hawke Institute, University of South Australia.
- Hayward, K. & Colman, R. (2004). *The Costs and Benefits of Gaming: A Literature Review with emphasis on Nova Scotia*. Glen Haven, NS: GPI Atlantic.
- Henriksson, L.E. (2001). Gambling in Canada: Some insights for cost-benefit analysis. *Managerial and Decision Economics*, 22(1-3), 113-123.
- HLT Advisory Inc. (2008). *Economic Impacts of the Canadian Gaming Industry: Key Findings Report*. Toronto, ON: Canadian Gaming Association.
- Houpt, A., Volberg, R.A., Williams, R.J., Stanek, E.J. & Zorn, M. (2015). *Key Findings from SEIGMA Research Activities and Potential Implications for Strategic Planners of Problem Gambling prevention and Treatment Services in Massachusetts*. White Paper. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst.
- Hsu, C.H. (2014). *Legalized Casino Gaming in the United States: The Economic and Social Impact*. Routledge.
- Kelly, W.R. (2004). *The Social Impacts of Legalized Gambling*. Austin, TX: M. Crane & Associates.
- Kindt, J.W. (1994). The economic impacts of legalized gambling activities. *Drake Law Review*, 43, 51-95.
- LaPlante D.A. & Shaffer H.J. (2007). Understanding the influence of gambling opportunities: Expanding exposure models to include adaptation. *American Journal of Orthopsychiatry* 77:616- 23.
- LendEDU (July 11, 2017). Did we get lucky? LendEDU's Lottery Study & Report. <https://lendedu.com/blog/lottery-study-report/>
- Littlepage, L., Payton, S. & Atibil, C. (2004). *Riverboat Gambling in Indiana: An Analysis of the Impacts*. Indianapolis, IN: Center for Urban Policy and the Environment.
- Lorains, F.K., Cowlishaw, S. & Thomas, S.A. (2011). Prevalence of comorbid disorders in problem and pathological gambling: Systematic review and meta-analysis of population surveys. *Addiction*, 106 (3), 490-496.
- Marfels, C. (1997). Economic impact of legalized casino gaming in the Nova Scotia and Ontario markets. *Gaming Law Review*, 1(1), 91-96.
- Mashantucket Pequot Gaming Enterprise Annual Report (2016). *Annual Report for Fiscal Years Ended September 30, 2016, 2015, and 2014*. December 28, 2016. <https://emma.msrb.org/ER1007587-ER788915-ER1190258.pdf>
- Massachusetts Council on Compulsive Gambling (MCCG) (2014). *Historical Activity Report for SEIGMA FY'08 Through FY'13*.

Massachusetts Courts (2018). Probate and Family Court. <http://www.mass.gov/courts/court-info/court-management/case-stats/>

Massachusetts Department of Elementary and Secondary Education (2018). Student Profiles. <http://profiles.doe.mass.edu/>

Massachusetts Department of Public Health (2017a). *Treatment and Services Gap Analysis*. Presentation to the Public Health Trust Fund Executive Committee. October 4, 2017.

Massachusetts Department of Public Health (2017b). *Suicide and Self-Inflicted Injuries*.

Massachusetts Department of Transportation (2018a). Crash Portal.

<https://services.massdot.state.ma.us/crashportal/>

Massachusetts Department of Transportation (2018b). Traffic Volumes <https://www.mass.gov/traffic-volume-and-classification>

Massachusetts Gaming Commission (2016). *Fourth Annual Report of the MGC Division of Racing*.

Massachusetts Gaming Commission (2018). *Revenue*. <https://massgaming.com/regulations/revenue/>

Massachusetts Office of Labor and Workforce Development (2018). ES-202.

http://lmi2.detma.org/lmi/lmi_es_a.asp

Massachusetts State Lottery Commission (2016a). *Charitable Games 2016 Annual Report*.

Massachusetts State Lottery Commission (2016b). *Fiscal Year 2016*.

Massachusetts State Lottery Commission (2017a). *Fiscal Year 2017*.

Massachusetts State Lottery Commission (2017b). *Charitable Games 2017 Annual Report*.

Massachusetts Violent Death Reporting System (MAVDRS) (2013). <https://www.mass.gov/service-details/learn-more-about-mavdrs>

Massachusetts Violent Death Reporting System (MAVDRS) (2018). <https://www.mass.gov/service-details/learn-more-about-mavdrs>

Mohegan Sun (2018). *Mohegan Tribal Gaming Authority SEC Filing 10-K Reports*. <https://www.last10k.com/sec-filings/mtga/0001005276-17-000017.htm>

Moskowitz, E. (2009, December 26, 2009). The final lap for greyhounds in Mass. *Boston Globe*. http://www.boston.com/news/local/massachusetts/articles/2009/12/26/in_massachusetts_a_final_lap_for_greyhounds/

Motamedi, R. & Peake, R. (2017). *The Construction of Plainridge Park Casino: Spending, Employment, and Economic Impacts*. March 7, 2017.

<https://www.umass.edu/seigma/sites/default/files/The%20Construction%20of%20Plainridge%20Park%20Casino%20-%20REVISED.pdf>

National Gambling Impact & Policy Commission (1999). *National Gambling Impact Study Commission Final Report*. The Commission.

National Highway Traffic Safety Administration (NHTSA) (2018). <https://cdan.nhtsa.gov/stsi.htm#>

Nichols, M.W. (2014). *Measuring the Economic Effects of Casinos on Local Areas: Applying a Community Comparison Matching Method*. November 5, 2014.
https://www.umass.edu/seigma/sites/default/files/Economic%20Effects%20of%20Casinos%20Matching%20Results%2011_5_14FINAL.pdf

Nichols, M.W. (2017). *Lottery Revenue and Plainridge Park Casino: Analysis of first Year of Casino Operation*. January 19, 2017.
[https://www.umass.edu/seigma/sites/default/files/MA%20Lottery%20Revenue%20and%20Plainridge%20Park%201%20Year%20Analysis%20\(final\).pdf](https://www.umass.edu/seigma/sites/default/files/MA%20Lottery%20Revenue%20and%20Plainridge%20Park%201%20Year%20Analysis%20(final).pdf)

Nichols, M.W., Stitt, B.G. & Giacomassi, D. (2000). Casino gambling and bankruptcy in new United States casino jurisdictions. *The Journal of Socio-Economics*, 29(3), 247-261.

Nichols, M.W. & Tosun, M. (2013). *The Impact of Legalized Casino Gambling on Crime*. Discussion Paper Series, Forschungsinstitut zur Zukunft der Arbeit, No. 7299, Institute for the Study of Labor (IZA), Bonn.

Nichols, M.W., Tosun, M.S. & Yang, J. (2015). The fiscal impact of legalized casino gambling. *Public Finance Review*, 43(6), 739-761.

O'Neil, M., Chandler, N., & SA Centre for Economic Studies (2009). *Social Impacts of Gambling: A Comparative Study*. Adelaide, South Australia.

Peake, T. & Motamedi, R. (2017). *Plainridge Park Casino First Year of Operation: Economic Impacts Report*. October 6, 2017.
<https://www.umass.edu/seigma/sites/default/files/PPC%20First%20Year%20Operating%20Report%202017-10-06.pdf>

Pender, J.L., Weber, B.A., Johnson, T.G. & Fannin, J.M. (Eds.) (2014). *Rural Wealth Creation*. Routledge.

Persky, J. (1995). Impact studies, cost-benefit analysis and casinos. *Journal of Gambling Studies*, 11(4), 349-360.

Pyramid Associates (2015). *Northeastern Casino Gaming Update, 2015*.
<https://www.americangaming.org/research/reports/northeastern-casino-gaming-update>

Rabushka, A. (2010). *Taxation in Colonial America*. Princeton University Press.

Renski, H. & Peake, T. (2016a). *Baseline Real Estate Conditions: Host Community Profile: Everett*. August 30, 2016. [https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Everett_2016-08-30%20\(final\).pdf](https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Everett_2016-08-30%20(final).pdf)

Renski, H. & Peake, T. (2016b). *Baseline Real Estate Conditions: Host Community Profile: Plainville*. August 30, 2016. [https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Plainville_2016-08-30%20\(final\).pdf](https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%20Plainville_2016-08-30%20(final).pdf)

- Renski, H. & Peake, T. (2016c). *Baseline Real Estate Conditions: Host Community Profile: Springfield*. August 30, 2016. https://www.umass.edu/seigma/sites/default/files/Real%20Estate%20Profile%2C%20Springfield_2016-08-30%20%28final%29_0.pdf
- Renski, H. & Peake, T. (2017). *Baseline Real Estate Conditions: Host Community Profile: Plainville*. 2017 update.
- Rhode Island Lottery (2018). *Financial Information*. <http://www.rilot.com/financial.asp>
- Rodriguez-Monguio, R., Brand, E. & Volberg, R. (2018). The economic burden of pathological gambling and co-occurring mental health and substance use disorders. *Journal of Addiction Medicine*, 12(1), 53-60.
- Salame, L., Williams, R.J., Zorn, M., Peake, T., Volberg, R., Stanek, E. & Mazar, A. (2017). *Patron and License Plate Survey Report: Plainridge Park Casino 2016*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst.
<https://www.umass.edu/seigma/sites/default/files/PPC%20Patron%20Survey%20Report%202017-10-17.pdf>
- Salter, M.A. (1974). An analysis of the role of games in the fertility rituals of the native North American. *Anthropos*, 69, 494–504.
- Salter, M.A. (1980). Play in ritual: An ethnohistorical overview of native North America. In H.B. Schwartzman (Ed.), *Play and Culture: 1978 Proceedings of the Association for the Anthropological Study of Play* (pp. 70–82). West Point, NY: Leisure Press.
- Schoen, J.W. (Jan 13, 2016). These states offer the best and worst odds for lottery players.
<https://www.nbcnews.com/better/money/these-states-offer-best-worst-odds-lottery-players-n495976>
- Schwartz, D.G. (2006). *Roll the Bones: The History of Gambling*. Gotham Books.
- Shaffer, H.J., LaBrie, R.A. & LaPlante, D. (2004). Laying the foundation for quantifying regional exposure to social phenomena: Considering the case of legalized gambling as a public health toxin. *Psychology of Addictive Behaviors*, 18(1), 40-48.
- Single, E. (2003). Estimating the costs of substance abuse: Implications to the estimation of the costs and benefits of gambling. *Journal of Gambling Studies*, 19(2), 215-233.
- Stevens, R.M.G. & Williams, R.J. (2004). *Socio-Economic Impacts associated with the Introduction of Casino Gambling: A Literature Review and Synthesis*. University of Lethbridge, Lethbridge, Alberta, Canada.
- Temple, R. (2009). *The Pilgrims Would Be Shocked: The History of Thoroughbred Racing in New England*. Robert Temple. [ISBN 978-1-4415-1428-8](https://www.amazon.com/dp/0978144151428).
- Temple, R. (2010). *The History of Harness Racing in New England*. Xlibris.
- The Patriot Ledger (2017). *Bingo crowds dwindling as game loses popularity*. February 17, 2017.
<http://www.patriotledger.com/news/20170217/bingo-crowds-dwindling-as-game-loses-popularity>
- Thompson, W.N. (2001). *Gambling in America: An Encyclopedia of History, Issues, and Society*. Abc-Clio.

- Thompson, W.N., Gazel, R. & Rickman, D. (1997). Social and legal costs of compulsive gambling. *Gaming Law Review*, 1(1), 81-89.
- Tinbergen, J. & Huetting, R. (1992). GNP and market prices: wrong signals for sustainable economic success that mask environmental destruction. In: R. Goodland, H. Daly and S. El Serafy (eds). *Population, Technology and Lifestyle: The Transition to Sustainability*. Island Press, Washington D.C.
- U.S. Census (2017). <https://www.census.gov/>
- U.S. Courts (2018). <http://www.uscourts.gov/statistics-reports/caseload-statistics-data-tables/>
- U.S. Department of Labor (2018a). American Time Use Survey. <https://www.bls.gov/tus/>
- U.S. Department of Labor (2018b). Quarterly Census of Employment and Wages. <https://www.bls.gov/tus/>
- U.S. Department of Health & Human Services (2018). Children's Bureau: Child Maltreatment Reports. <https://www.acf.hhs.gov/cb/research-data-technology/statistics-research/child-maltreatment>
- University of Massachusetts Donahue Institute (UMDI) (2017). *New Employee Survey at Plainridge Park Casino: Analysis of First Two Years of Data Collection*. May 10, 2017. https://www.umass.edu/seigma/sites/default/files/PPC%20Employee%20Survey%20Report%202017-05-9_For%20Releasev2.pdf
- Victorian Gambling Research Panel (2001). *Social and Economic Impacts of Gaming: A Framework for Research*. Melbourne, Australia: Victorian Gambling Research Panel.
- Volberg, R.A., Williams, R.J., Stanek, E.J., Houpt, K.A., Zorn, M., Rodriguez-Monguio, R. (2017). *Gambling and Problem Gambling in Massachusetts: Results of a Baseline Population Survey*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst.
- Volberg, R.A., Williams, R.J., Stanek, E.J., Zorn, M., Mazar, A. (2017). *Analysis of MAGIC Wave 2: Incidence and Transitions*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst. www.umass.edu/macohort
- Walker, D.M. (1999). Legalized gambling and the export base theory of economic growth. *Gaming Law Review*, 3(2/3), 157-163.
- Walker, D.M. (2003). Methodological issues in the social cost of gambling studies. *Journal of Gambling Studies*, 19(2), 149-184.
- Walker, D.M. (2007). *Economics of Casino Gambling*. New York: Springer.
- Walker, D.M. (2008a). Clarification of the social costs of gambling. *Journal of Public Budgeting, Accounting & Financial Management*, 20(2), 141-152.
- Walker, D.M. (2008c). *Challenges that Confront Researchers on Estimating the Social Costs of Gambling*. Washington, DC: American Gaming Association.

Walker, D.M. (2008d). *Issues to Consider in Implementing the "Socio-Economic Impact of Gambling (SEIG) Framework"*. Report prepared for the Canadian Gaming Association.

Walker, D.M. (2013). *Casinonomics: The Socioeconomic Impacts of the Casino Industry*. Springer Science & Business Media.

Walker, D.M. & Barnett, A.H. (1999). The social costs of gambling: An economic perspective. *Journal of Gambling Studies*, 15(3), 181-212.

Walker, D.M. & Jackson, J.D. (1998). New goods and economic growth: Evidence from legalized gambling. *Review of Regional Studies*, 28(2), 47-69.

Walker, D.M. & Jackson, J.D. (2007). Do casinos cause economic growth? *The American Journal of Economics and Sociology*, 66(3), 593-607.

Walker, D.M. & Sobel, R.S. (2016). Social and economic impacts of gambling. *Current Addiction Reports*, 3(3), 293-298.

Wikipedia (2018). Gambling in Massachusetts. https://en.wikipedia.org/wiki/Gambling_in_Massachusetts

Williams, L.V. & Siegel, D.S. (Eds.). (2013). *The Oxford Handbook of the Economics of Gambling*. Oxford University Press.

Williams, R.J. (2011). A framework for assessing the socioeconomic impacts of gambling. In Y.D. Belanger (ed.), *First Nations Gambling in Canada: Current Trends and Issues*. Winnipeg, Manitoba: University of Manitoba Press.

Williams, R.J., Hann, R., Schopflocher, D., West, B., McLaughlin, P., White, N., King, K., & Flexhaug, T. (2015). *Quinte Longitudinal Study of Gambling and Problem Gambling*. Report prepared for the Ontario Problem Gambling Research Centre. February 20, 2015. <https://www.uleth.ca/dspace/handle/10133/3641>

Williams, R.J., Pekow, P.S., Volberg, R.A., Stanek, E.J., Zorn, M., Houpt, K.A. (2017). *Impacts of Gambling in Massachusetts: Results of a Baseline Online Panel Survey (BOPS)*. Amherst, MA: School of Public Health and Health Sciences, University of Massachusetts Amherst.

Williams, R.J., Rehm, J., & Stevens, R.M.G. (2011). *The Social and Economic Impacts of Gambling*. Final Report prepared for the Canadian Consortium for Gambling Research. March 11, 2011. <http://hdl.handle.net/10133/1286>

Williams, R.J., Stevens, R.M.G. & Nixon, G. (2011). Gambling and problem gambling in North American Aboriginal people. In Y.D. Belanger (ed.), *First Nations Gambling in Canada: Current Trends and Issues*. University of Manitoba Press, Winnipeg, Manitoba. February 2011.

Williams, R.J. & Volberg, R.A. (2014). Classification accuracy of four problem gambling assessment Instruments in population research. *International Gambling Studies*, 14 (1), 15-28.

Williams, R.J., Volberg, R.A. & Stevens, R.M.G. (2012). *Population Prevalence of Problem Gambling: Methodological Influences, Standardized Rates, Jurisdictional Differences, and Worldwide Trends*. Report prepared for the Ontario Ministry of Health and Long-Term Care and the Ontario Problem Gambling Research Centre. May 8, 2012. <https://www.uleth.ca/dspace/handle/10133/3068>

Wood, R.T. & Williams, R.J. (2007b). How much money do you spend on gambling? The comparative validity of question wordings used to assess gambling expenditure. *International Journal of Social Research Methodology: Theory & Practice*, 10 (1), 63-77. <https://www.uleth.ca/dspace/handle/10133/752>

Wu, S.T. & Chen, Y.S. (2015). The social, economic, and environmental impacts of casino gambling on the residents of Macau and Singapore. *Tourism Management*, 48, 285-298.

Wynne, H.J. & Shaffer, H.J. (2003). The socioeconomic impact of gambling: The Whistler symposium. *Journal of Gambling Studies*, 19(2), 111-121.

APPENDIX A: Matched Communities Comparison

As mentioned in the *THEORETICAL FRAMEWORK FOR CONDUCTING SOCIOECONOMIC IMPACT ANALYSES OF GAMBLING* section earlier in this report, one of the methodologies for more strongly attributing socioeconomic changes to the introduction of gambling is a matched control comparison where changes in the set of communities receiving the new form of gambling are compared against changes in an economically, socially, and demographically similar set of communities that did not receive this new form of gambling. Matching is a well-established and widely accepted method used to analyze the economic impact of major economic, policy, or program changes, such as the opening of a new factory, the introduction of educational programs or job search assistance programs, or, in our case, the opening of a casino.⁴³ While matching communities is a generally accepted approach, there are many challenges to applying a matching community comparison method to help estimate the impacts of casino introduction in Massachusetts. A description of these challenges and how they affect our methods of analysis are described below.

Geographic Scope and Unit of Analysis

Host communities for the Massachusetts Gaming Commission are well-defined in Chapter 23K of the General Laws. A host community is “a municipality in which a gaming establishment is located or in which an applicant has proposed locating a gaming establishment.” In spite of this clear geographic delineation, we must still confirm the most appropriate geographic unit for analysis. Should it be the city or town where the casino is located, the county where the casino is located, or based on some other definition, such as distance from the casino? Many academic studies investigating the impacts of casinos are conducted at the county level. However, the reason tends to be that data at more aggregate levels, such as the county or the state, is easier to obtain than data at the town/city level which tends to be more limited and difficult to obtain.

The question of the geographic scope for the analysis is important as impacts will vary depending on the definition selected. Clearly, the impact that the casino has on the host city or town is important and should be measured whenever possible. However, the impacts of a casino are likely to spread beyond city and town borders. How far beyond is not known.

The availability and reliability of data are key practical determinants in the geographic area to be analyzed. Obtaining economic and social data for geographic units other than well-defined city and county boundaries is not possible. However, analysis at the county level in Massachusetts is clearly too broad to examine the most immediate, local impacts. *Therefore, we have decided to conduct our analysis at the city/town level.*⁴⁴ This does limit somewhat the social variables that can be measured (e.g., rate of problem gambling is not available at the community level).

⁴³ For examples, see Rubin (1974), Rosenbaum and Rubin (1985), Heckman, Ichimura, and Todd (1997), Imbens and Wooldridge (2009).

⁴⁴ Applying matching methods to the analysis of sub-community or neighborhood impacts is also not possible due to a lack of sub-city data across all communities and a clear definition of neighborhood. Sub-community and neighborhood impacts can be inferred, in part, through primary data collection.

Selecting Matched Control Communities

Massachusetts will have up to three casinos and one slots parlor, for a potential total of four host communities. To develop a customized, academically sound matching method for Massachusetts host communities, we have focused on selecting the most appropriate matched control communities to use for comparison with the host communities. The most appropriate control community is one that closely resembles the host community prior to the casino opening. Choosing the control community involves several decisions, including the matching method utilized, characteristics chosen to perform matching, and the number of control communities.

There are two basic methods used to select matched control communities: covariate matching and propensity score matching. Having only four host communities prohibits the use of propensity score matching.⁴⁵ As a result, we have used covariate matching where control communities are selected based on their economic and demographic similarity to casino communities.

Covariate matching is sometimes referred to as nearest neighbor matching and the analogy is useful. We want to select control communities that are most similar to their casino counterparts. This involves developing a score to measure community similarity using a method known as Mahalanobis matching.⁴⁶ A simple example is helpful to illustrate the basic idea of using Mahalanobis distance scores for nearest neighbor matching. Consider two measures, the unemployment rate and the percent of the population with a college degree. To choose Springfield's "nearest neighbors," the values of these two measures in Springfield are compared with the values for every other community.⁴⁷ The community with the smallest difference across these two measures is Springfield's best match, the next smallest is the second best match, etc. Every community is ranked in terms of its similarity to Springfield on these two measures.

The impact measures to analyze and the characteristics to use for matching casino and control communities are also important. These include a collection of demographic variables, social variables (e.g., poverty rate), and economic variables (e.g., job growth). These are listed and described below in Table 62. These indicators, measured prior to the casino opening, are included in our matching characteristics and used in selecting our matched control jurisdictions. Intuitively, if we want to know how a casino changes local conditions related to employment (unemployment, job growth, labor force participation, and household income), selecting control communities that are similar to the casino communities prior to the casino introduction based on these characteristics is an obvious strategy. Zhao (2004) demonstrates that including outcome measures as selection characteristics improves matching.

In addition, we match communities based on several other economic, social and demographic characteristics to ensure that our matched communities are as similar to the casino communities as possible. These include: total

⁴⁵ Zhao (2004) demonstrates that in small samples ($n = 500$ in his study, 100 of which were "treatment" observations), propensity score matching does not perform well compared to other methods.

⁴⁶ Mahalanobis matching accounts for the Euclidian distance, sometimes referred to as straight-line distance, between values of the variables for the casino and potential control groups and the correlation between those variables. Mahalanobis matching has been shown by Zhao (2004) to be robust to various settings (sample size, number of matching characteristics, and correlation of matching characteristics) relative to other matching techniques. See the full report on [Matching Communities](#) for more detail.

⁴⁷ The absolute difference between Springfield and every other community is calculated for each measure and then summed across both measures.

population; education (*percent with college degree*); race (*percent black*); ethnicity (*percent Hispanic*); poverty (*percent of population below poverty*); and industrial base (*percent employed in manufacturing*).

Table 62. Description of Matching Variables for Control Communities Comparison

Matching Variables	Description	Source
Total Population	Total population over the period 2008-2012.	d
% of Population that is Black	Percent of the population that is Black or African American over the period 2008-2012.	d
% of Population that is Hispanic	Percent of the population that is Hispanic or Latino over the period 2008-2012.	d
% of Population with College Degree	Percent of the population over age 25 with only a Bachelor's degree over the period 2008-2012.	d
Household Income	Median household income over the period 2008-2012.	d
% of Population in Poverty	Percent of population living in poverty over the period 2008-2012.	d
Unemployment Rate	Average unemployment rate (percent of the labor force that is unemployed), 2008-2012.	a
Labor Force Participation Rate	Average percent of population over 16 in the labor force, 2008-2012.	a,d
Job Growth	Average annual growth in the number of jobs, 2007-2011.	b,c
% of Workforce employed in Manufacturing	Average percent of the workforce employed in manufacturing, 2007-2011.	b,c

Sources:

- a. Local Area Unemployment Statistics (LAUS), Bureau of Labor Statistics (BLS)
- b. Employment and Wages Data (ES-202), BLS and State Employment Security Agencies
- c. Longitudinal Employer Household Dynamics Origin Destination Employment Statistics (LODES) U.S. Census Bureau
- d. American Community Survey (ACS), U.S. Census Bureau.

The process of matching required gathering the data described in Table 62 prior to any casino construction or opening. We measured these variables over the five year period 2008-2012, with the exception of five year job growth and the percent of the workforce in manufacturing, which were measured over 2007-2011 due to a lack of data from 2012 (as of this date). This time period was chosen for practical and theoretical reasons. From a theoretical perspective, this period includes years from the recession and recovery and captures variation in our matching characteristics over time. From a practical perspective, several of the measures (population, race, ethnicity, poverty, and education) are taken from the American Community Survey (ACS) which is estimated over five-year intervals, the most recent of which is 2008-2012.

Control communities were selected from the Northeastern United States, including Massachusetts, Connecticut, Rhode Island, Vermont, New Hampshire, Maine, New York, Pennsylvania, and New Jersey. These states are close to Massachusetts and have a similar economic history and will ensure a sufficient sample of potential matching communities.

The number of control communities to choose for each host community was another important decision. Matching to a single control community can be limited due to the availability of too little information while matching to many control communities results in relying on poorer, more distant matches. *We chose five control jurisdictions for each host community in order to balance the tradeoff between too little information and*

*poorer matches.*⁴⁸ Moreover, a single community may not be the best match across all measures. Choosing multiple communities to create a single “average” control community better ensures similarity to the host community across all matching variables. Finally, it should be noted that while the ordinal ranking of jurisdictions (based on the Mahalanobis score) is useful for comparing the quality of matches for each casino community, they are not comparable across casino communities. The best control jurisdiction for the casino located in Springfield, may not be as close, measured by the Mahalanobis score, as the fifth best control jurisdiction for a casino located in Plainville.

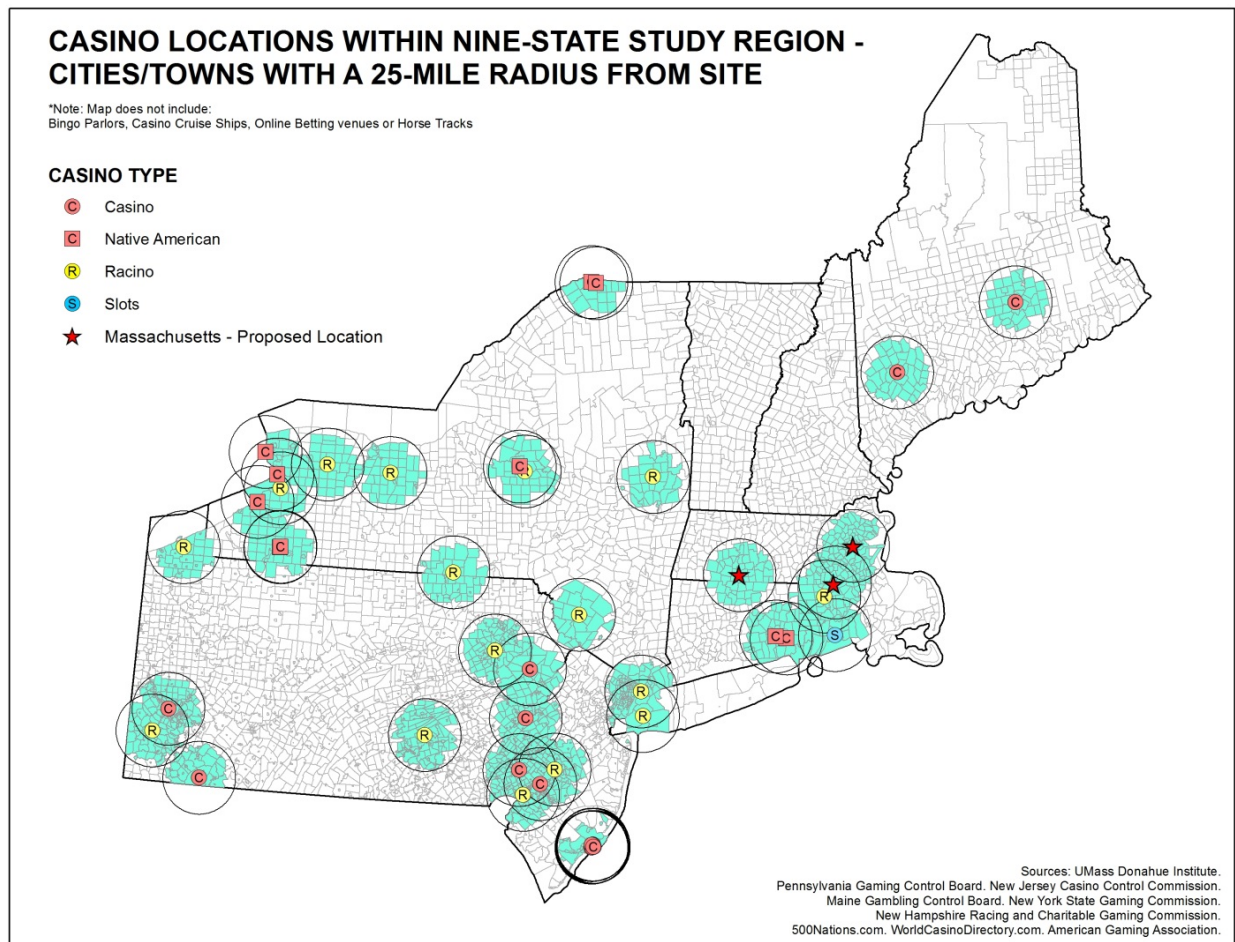
Additional Matching Criteria

In this section we describe some final aspects of the process undertaken to select host community matches, namely applying a geographic filter, a size or scale filter and an income filter. In addition to the ranking provided by the Mahalanobis score, three other factors were considered when selecting matched communities.

First, to ensure that matched communities are not also influenced by a casino, communities completely within 25 miles of an existing casino were considered ineligible as matches (see Figure 56). The distance was based on economic and practical considerations. Economically, in the Northeast it is unlikely that a casino will have significant employment and economic impacts beyond a 25-mile radius. Practically, to expand beyond 25 miles greatly reduces the number of potential matching communities. A 25-mile radius ensures that our control communities are not influenced by a casino and allows for sufficient high-quality matches. The average distance of our control communities to the nearest casino is 38.6 miles. While the city center of Haddam, Connecticut, a control community for Plainville is 23 miles from the nearest casino, not all of Haddam lies within the 25 mile radius, hence its eligibility. While we are confident that the selection of Haddam as a control community will not unduly influence the results of our analysis, we plan to verify this by comparing results when including and excluding Haddam as a potential control community.

⁴⁸ For example, Abadie et al. (2004) choose four control jurisdictions based on this tradeoff between too little information and using poorer, more distant matches.

Figure 56. New England Communities within 25 miles of Existing and Proposed Casinos



Second, matched communities should be similar in size to their host community counterparts. Specifically, a matched community’s population should be between 75% and 150% of the casino host community.

Third, matched communities were filtered to have similar household income characteristics. In this case, we sought communities with median household income between 75 percent and 150 percent of the host community to be eligible as a match. After applying this criterion, most matched communities are closer than these bounds and the median household income levels of our five matches are very close to their host community counterparts.⁴⁹

After applying the above criteria, the top five matches for each of the potential casino host communities are shown in Figure 57 and a list of each host and matching community for all variables is shown in Table 63. This table also provides the average of the five matched control communities. These can be thought of as a combined or conglomerate control for comparison with the casino jurisdiction. The advantage of comparing each host community with an “average match” is that it better ensures similarity across all selection characteristics.

⁴⁹ We also eliminated beach resort communities since these are likely to be different economically from our casino communities (e.g., Riverhead, NY on Long Island was eliminated as a match for Everett). Formally accounting for tourism, for example by including hotel occupancy rates as a selection variable, is not possible due to a lack of data.

Figure 57. Massachusetts Host Communities and Matched Controls

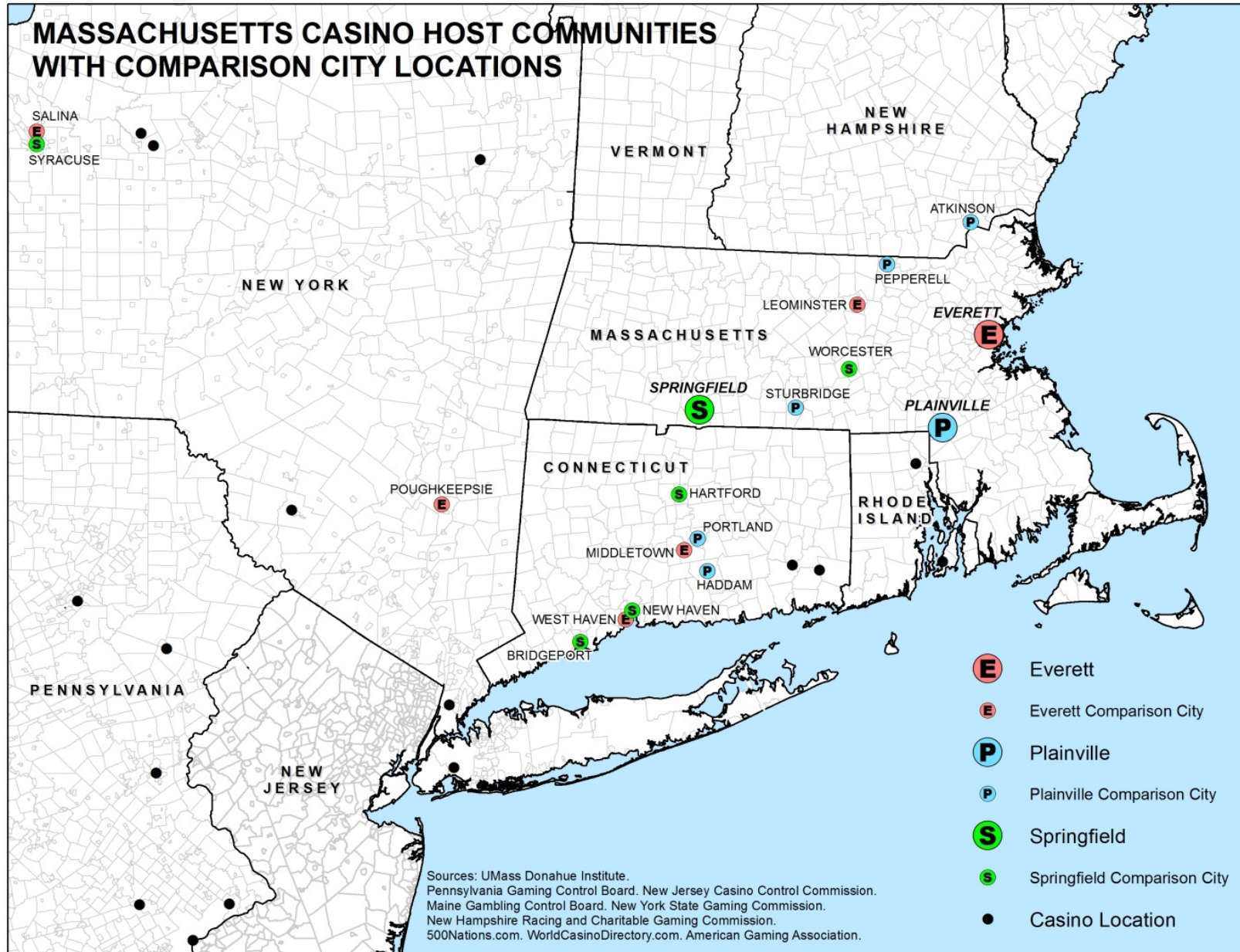


Table 63. Host and Matched Control Communities

City/town	Population	Household Income	% Black	% Hispanic	% College Degree	% Poverty	Unempl. Rate	% Manuf.	Labor Force Partic.	Job Growth	% of Host City Population	% of Host City Household Income	Miles to Nearest Casino
Springfield, MA	153,278	\$35,163	21.6	39.5	10.5	28.7	10.9	5.08	56.97	-0.56	100%	100%	
Bridgeport, CT	144,446	\$39,822	35.6	37.4	10.1	23.6	12.06	10.55	59.54	-1.53	94%	113%	40
Worcester, MA	181,473	\$45,679	11.3	20	18.4	20.1	8.54	7.25	58.1	-0.51	118%	130%	31
Hartford, CT	124,879	\$28,931	37.7	43	8.6	33.9	14.68	1.2	52.67	-1.37	81%	82%	36
New Haven, CT	129,898	\$38,482	35	26.5	14.8	26.9	11.56	3.5	55.78	0.58	85%	109%	45
Syracuse, NY	144,703	\$31,459	29.3	7.6	14.5	33.6	9.12	3.61	54.95	-3.01	94%	89%	28
Average Match Community	145,080	36,875	29.8	26.9	13.3	27.62	11.19	5.22	56.21	-1.17	95%	105%	36
Everett, MA	41,621	\$49,702	14.1	19.8	11.6	12.8	7.44	7.34	60.01	-1.55	100%	100%	
West Haven, CT	55,386	\$51,911	19.7	16.2	12.7	11.7	9.18	7.63	68.53	-1.73	133%	104%	47
Poughkeepsie, NY	44,357	\$68,886	9.1	9	19.2	10	7.36	18.18	58.75	-1.52	107%	139%	41
Salina, NY	33,682	\$51,952	4.3	3.5	14.7	8.4	7.34	16.78	64.21	-0.4	81%	105%	28
Leominster, MA	40,879	\$59,604	5.7	13.4	17.6	9.9	9.16	15.97	61.44	-1.62	98%	120%	46
Middletown, CT	47,530	\$60,542	12.8	8.7	19.7	10.9	7.68	14.56	68.46	-3.18	114%	122%	30
Average Match Community	44,367	\$58,579	10.3	10.2	16.8	10.18	8.14	14.62	64.28	-1.69	107%	118%	38.4
Plainville, MA	8,278	\$83,750	0.9	1.7	26.6	4.7	8.44	11.93	76.89	-0.53	100%	100%	
Haddam, CT	8,308	\$89,184	0	2.3	27.4	3.8	5.76	3.7	78.94	0.31	100%	106%	23
Atkinson, NH	6,756	\$82,889	0	1.8	26.5	4	6.24	8.89	70.96	-1.15	82%	99%	67
Pepperell, MA	11,537	\$85,150	0.2	1.6	26	4.2	6.22	6.34	70.69	-0.85	139%	102%	54
Portland, CT	9,500	\$92,344	1.2	3.8	25.1	5.1	6.98	13.06	70.01	-2.05	115%	110%	27
Sturbridge, MA	9,230	\$83,375	0.2	4	24.3	9	6.78	10.42	70.57	0.15	112%	100%	36
Average Match Community	9,066	\$86,588	0.3	2.7	25.9	5.22	6.4	8.48	72.23	-0.72	110%	103%	41.4
Average Massachusetts Community	23,897	\$78,971	2.74	4.77	23.17	7.39	7.02	10.04	67.42	-0.61	N/A	N/A	

Table 63 clearly shows that the casino host communities are quite different from Massachusetts as a whole. For example, with the exception of Plainville, the host communities have lower median household income, higher rates of poverty, and a lower proportion of residents with a college degree than Massachusetts. In contrast, our matched control communities are much more similar economically, socially, and demographically to our casino host communities.

As discussed above, communities may adopt casinos in part because they are economically and demographically different from other communities in the same region or state. This table demonstrates these differences and highlights the advantage of using matching methods to select economically and demographically similar communities to compare with the host communities. For example, Springfield has lower household income and percent of the population with a college degree and a greater proportion of the population living in poverty than Massachusetts as a whole. Our matched control communities for Springfield, by comparison, have similar values for these characteristics.⁵⁰ While there are differences between host and control communities in some individual characteristics (e.g., Syracuse has a lower percent of the population that is Hispanic relative to Springfield), overall our matched control communities are more similar to our casino host communities than Massachusetts as a whole. This can clearly be seen when comparing the host communities with the “average match.” In addition, for each host community the matched control communities are dispersed across two to three states (with at least one in-state Massachusetts match for each host community). This geographic dispersion is intended to minimize the chances that our control communities will be influenced by local economic shocks or the casino openings in Massachusetts. As a whole, comparison of the casino host communities with our matched control communities, whether individually or with the “average match,” can better account for economic, social, and demographic variation between communities and increase confidence in our estimated impacts.

Future Analysis

Once all three casinos open in Massachusetts, data on crime rates, traffic volume, traffic accidents, poverty rates, unemployment rates, job growth, labor force participation, household income, and other variables can be gathered for the host communities and the identified matching comparisons. How these variables perform over time in the host communities compared to the matched comparisons will then provide an insightful assessment of the impacts of introducing casinos. As mentioned, several variables are not available at the community level (e.g., problem gambling, suicides, bankruptcy) and will not be included in the analysis. For this reason, other methods, including primary data collection, qualitative interviews, comparing host communities with pre-casino trends, and with results from an economic impact simulation model using REMI, will also be utilized.

References

Abadie, A., Drukker D., Herr, J.L., and Imbens, G.W. (2004). Implementing matching estimators for average treatment effects in Stata. *The Stata Journal*, 4(3): 290-311.

Heckman, J.J., Ichimura, H., and Todd, P.E. (1997). Matching as an econometric evaluation estimator: Evidence from evaluating a job training programme. *Review of Economic Studies*, 64(4): 605-54.

⁵⁰ After applying the filters, especially the population thresholds, there are relatively few qualifying matches for Springfield. Even though its Mahalanobis score is quite a bit higher than the other matches for Springfield, Syracuse’s economy is largely similar to and consistent with that of Springfield, so we still felt comfortable using it as a match.

- Holland, P. W. (1986). Statistics and causal inference. *Journal of the American Statistical Association*, 81(396): 945-60.
- Imbens, G.W. and Wooldridge, J.M. (2009). Recent developments in the econometrics of program evaluation. *Journal of Economic Literature*, 47(1): 5-86.
- Rosenbaum, P.R. and Rubin, D.B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *American Statistician*, 39(1): 33-38.
- Rubin, D.B. (1974). Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of Educational Psychology*, 66(5): 688-701.
- Sekhon, J.S. (2009). Opiates for the matches: Matching methods for casual inference. *Annual Review of Political Science*, 12: 487-508.
- Zhao, Z. (2004). Using matching to estimate treatment effects: Data requirements, matching metrics, and Monte Carlo evidence. *Review of Economics and Statistics*, 86(1): 91-10.