

The Economic Impact of MSBA Investments on the Massachusetts Economy



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Executive Summary

The mission of the Massachusetts School Building Authority (MSBA) is to “partner with Massachusetts communities to support the design and construction of educationally-appropriate, flexible, sustainable, and cost-effective public school facilities.”¹ In pursuing this mission, the MSBA has distributed since FY2005 more than \$11.2 billion in grants to school districts throughout the Commonwealth. These grants have been used to fund the cost of constructing, renovating, and repairing elementary, secondary, and vocational schools in local and regional school districts throughout the state.² All of this activity is to help assure that Massachusetts continues to have school buildings that can meet the challenge of 21st century education.

What is often overlooked, however, are the direct and indirect economic benefits that flow to the state and its workers as a result of these large construction investments. This report, we hope, rectifies this shortcoming by providing an assessment of the impact of MSBA spending on state gross domestic output, employment, income, and state tax revenue. As this report will demonstrate, even relying on a conservative set of assumptions, the economic impact on the state is substantial.

The main conclusions of our research suggest that between FY2005 and FY2015, MSBA investments generated the following economic benefits (dollar amounts are in 2013 dollars):

- An increase in Massachusetts value-added (Gross State Product) of between \$6.5 and \$10.4 billion;
- Annual employment creation of between 7,300 and 11,600 jobs per year;
- Between \$4.1 and \$6.6 billion in total additional employment earnings;
- Between \$346.0 and \$550.3 million in total additional state tax revenue including:
 - Between \$264.4 and \$420.6 million in additional state personal income tax revenue;
 - Between \$44.2 and \$70.3 million in additional state sales tax revenue;
 - Between \$37.4 and \$59.5 million in additional state business tax revenue.

These estimates only pertain to the funds allocated to the cities and towns for their schools and do not include spending on school construction, renovation, and repair out of local school budgets that may have been encouraged by MSBA funding. These estimates also do not include \$3.63 billion in grant payments the MSBA made for projects authorized and approved under the Department of Education's former school building assistance program and \$13 million the MSBA has spent on commissioning construction projects. As such the ultimate economic impact of MSBA investments is likely larger than the estimates listed here. That much of this investment occurred while the economy was suffering the effects of the Great Recession suggests that MSBA activity played a significant role in boosting what otherwise would have been even more dire economic straits, putting unemployed workers to work, increasing consumer spending power, and augmenting the state treasury.

A note on the job-year metric. A job-year represents a person year of work. For example, if a construction job hired 100 construction workers, each of whom worked for two years on the

project, then that would represent 200 job-years. The estimate that MSBA spending created between 80,000 and 127,200 job-years means that, over this 11-year period, employment in the Commonwealth was, on average, between 7,300 and 11,600 higher than it would have been without the spending.

Background

The Massachusetts School Building Authority (“MSBA”) is a quasi-independent government authority established by the Legislature in 2004 to fund capital improvement projects for the Commonwealth’s public K-12 schools. The MSBA created a new competitive grant process to replace the former school building program. The MSBA works in collaboration with local districts to create affordable, sustainable, and energy efficient schools across Massachusetts.

The Former Program

In 1948, the Legislature created a temporary school building assistance program to encourage municipalities to regionalize local educational facilities to accommodate the post-World War II baby boom population. Originally set to expire in 1951, the school building assistance program was administered by the Department of Education and only grew in popularity over the years. The rate at which the Commonwealth was reimbursing cities and towns for school construction projects eventually grew to range from 50 to 90 percent of approved project costs.

In the 1980s, two recessions and the passage of a statewide local property tax limitation initiative petition, “Proposition 2½,” limited the ability of cities and towns to raise local funds. As a result, by the 1990’s, the demand by cities and towns for funding for school construction projects had outpaced the then current funding and management structure. By the early 2000’s, the “temporary” program had become unsustainable, accumulating more than \$11 billion in unfunded promises to local districts. By 2003, there were 428 projects on a waiting list to begin construction,

and communities that actually broke ground, routinely waited years – sometimes decades – to receive their first reimbursement payment from the state.

The MSBA

The MSBA was created in 2004 to administer and fund a new program to provide assistance to cities, towns, regional school districts and independent agricultural and technical schools to finance school construction, repair and renovation projects. The MSBA is mandated with achieving the effective planning, management and financial sustainability of a new program for school construction, repair and renovation. Since 2004, the MSBA has made over \$11.2 billion in payments to cities, towns and regional school districts, including full or partial payments to all of the eligible Waiting List Projects. The MSBA's grant program places tremendous emphasis on planning, due diligence and prioritization of scarce MSBA resources. The MSBA approves new projects through a competitive process that stresses need and urgency, and reimbursement can range from 31 to 80 percent of eligible project costs. There are currently more than 300 construction, renovation and repair projects in the MSBA's Capital Pipeline.

The MSBA, which has a designated revenue stream of one penny of the state sales tax, collaborates with municipalities to invest approximately \$500 million per year in schools across the Commonwealth. The mission of the MSBA is to fund the right-sized, most fiscally responsible and educationally appropriate solutions to create safe and sound learning environments, and it is committed to protecting the taxpayer dollars by improving the school building grant process and avoiding the mistakes of the past in the funding and construction of school facilities.

The MSBA has worked to improve the school building grant process in a number of innovative ways discussed below:

Progress Payments

In 2004 MSBA accelerated payments to school districts that would have been waiting, on average, 10-15 years for state funding under the former program. The MSBA pays school districts as they incur project costs through the “Pro-Pay” system. Districts can now use the MSBA’s web-based system to enter cost information and submit a request for reimbursement electronically for project costs that have been incurred and paid locally. The MSBA audits the submitted invoices and reimburses the district for its share of eligible project costs – typically within 15 days of receiving a complete reimbursement request.

The Pro-Pay system has saved districts millions in interest charges and makes school construction and repair more affordable. School districts no longer have to bond for the full cost of their projects, only their share.

Commissioning

MSBA funded buildings undergo an intensive quality assurance process that begins during design and continues through construction, occupancy, and operations. This process is known as commissioning. Building commissioning involves an independent third party testing a building’s systems and materials and the operation of the building as a whole. The MSBA requires and pays for the entire cost of building commissioning for all MSBA-funded projects. Commissioning ensures that the new building operates efficiently and as the owner intended. Commissioning also prepares the building staff to operate and maintain building systems and equipment.

The benefits of commissioning for the District include:

- Construction cost savings
- Improved coordination between design, construction, and occupancy
- Fewer system deficiencies at building turnover
- Energy savings
- Improved indoor environmental quality

Building commissioning is a critical component in any “green” building program employing several strategies to reduce a building’s energy use. Early in the design phase, energy issues are discussed among the project team. In design review, they look for design issues that may have an impact on maintenance accessibility or lead to inefficient system operation and wasted energy.

Part I MSBA Programs

The MSBA operates a number of different programs, each of which funds new construction, repair, or renovation of the Commonwealth’s schools. The MSBA reimburses school districts for eligible school construction costs as they are incurred. The grant amount is determined by the scope of the project and a reimbursement rate based on various economic and socioeconomic factors set by statute and ranges from 31% to 80%.

New Construction and Addition/Renovation

The MSBA’s grant program for all school building construction and renovation projects is a non-entitlement competitive program. The MSBA’s Board of Directors approve grants based on need and urgency as expressed by city, town, and regional school districts or independent agricultural and technical schools and validated by the MSBA.

The MSBA collaborates with districts to conduct feasibility studies and recommend the most cost-effective and educationally appropriate solution for a district’s needs. The solution may involve new construction or addition/renovation to existing school facilities. Upon board approval

the MSBA may enter into a Project Scope and Budget Agreement which defines the project scope, budget, schedule, and potential MSBA participation in a project. As of FY 2015 the MSBA has distributed approximately \$3.2 billion to districts for new construction and \$3.3 billion for addition/renovation projects.

New Construction – Model Schools

The goal of the Model School Program is to effectively adapt and re-use the design of successful, recently-constructed elementary, middle, and high schools. This program provides school districts that demonstrate “good fit” with model design plans that save design cost.

Districts participating in the Model School Program are eligible to receive up to five additional percentage points of funding which are added to the base rate of MSBA reimbursement. In practice, the higher reimbursements can mean the difference between a school district being able to afford a new facility and being forced to continue using a deficient one. As of FY 2015 the MSBA has distributed approximately \$580 million to districts for new model school projects.

Major Repair

The Major Repair Program is designed to address deficient school building systems to materially extend the life of a school and preserve an asset that is otherwise capable of supporting the required educational program. This program allows for a broad scope of work and for this reason it follows a process closely aligned with the MSBA’s new construction or renovation programs. As of FY 2015 the MSBA has distributed approximately \$211 million to districts for major repair projects.

Green Repair

The Green Repair program, launched in March 2010, was a one-time \$300 million investment into the Commonwealth’s schools. The MSBA issued bonds for the program and the

federal government subsidized the interest payments through the *American Recovery and Reinvestment Act of 2009*. This lowered the cost of the borrowing for the MSBA and brought cost effective funding for local school districts. The program offered districts the ability to complete repairs to roofs, windows, and boilers and allowed the MSBA to fund needed repairs to more than one school in a district. In order to maximize the impact of this program, The MSBA required participating districts to maintain an aggressive project schedule, appropriate funding quickly, and utilize a streamlined consultant selection process developed by the MSBA. As of FY 2015 the MSBA has distributed approximately \$179 million to districts for green repair projects.

Accelerated Repair

The Accelerated Repair Program was created based on lessons learned from the Green Repair Program. Like the Green Repair Program, the Accelerated Repair Program primarily targets windows, roofs, and boiler systems with a streamlined project timetable. Typically, these projects are completed within 18 months of a district being invited to participate in the program. The goal of the Accelerated Repair Program is to preserve existing assets by performing energy-efficient and cost saving upgrades which result in direct operational savings for school districts. As of FY 2015 the MSBA has distributed approximately \$53 million to districts for Accelerated Repair Projects.

Other – Feasibility Study/Schematic Design

Some projects do not fall under a specific program. Many of these projects are early on in the MSBA process and have not yet defined a scope of work. Other projects fall in this category because they did not receive the appropriations necessary from the local community for the project to move forward. The majority of payments in this category represent reimbursements for feasibility studies.

Spending Across Programs

Between FY2005 and FY2015, the MSBA made payments to school districts totaling \$11.2 billion. These payments represent funding for projects approved under the MSBA's new program, projects the MSBA inherited and moved forward under the waiting list, and projects authorized and approved under the Commonwealth's prior school building program. For the purposes of this study, \$3.63 billion of spending related to the prior program will be excluded as those grants were authorized and approved prior to the creation of the MSBA. This brings the total funding provided by the MSBA between FY2005 and FY2015 to \$7.58 billion.

Table 1 breakdowns the \$7.58 billion in spending by program and fiscal year. The Addition/Renovation and New Construction programs accounted for 86 percent of total spending. Spending by fiscal year ranged from \$343 million in FY2009 to \$1,684 million in FY2006 with 38 percent of total spending occurring in fiscal years 2006 and 2007. In the last four fiscal years spending has ranged between \$571 million and \$727 million.

The spending figures in **Table 1** include waitlist annual payments that vary from year to year, comprising about 4 percent of total spending. These payments actually reflect construction activity that occurred in fiscal years 2010 and earlier, and so were allocated to these earlier fiscal years. The spending totals by fiscal year before and after the allocation of waitlist payments are presented in the first two columns of **Table 2**.

In order to use the RIMS model, the spending data have to be deflated to 2013 dollars, the base year of the RIMS model. Spending was deflated using the New School Construction Producer Price Index from the Bureau of Labor Statistics. This deflator was not available prior to January 2006, so the Nonresidential Structures GDP deflator from the U.S. Bureau of Economic Analysis was used prior to 2006. The deflator indicates that construction cost inflation was quite high in

fiscal years 2005 through 2007, exceeding 10 percent in each year. This reflects the high demand for construction inputs in those years. The last column of **Table 2** contains the real spending in 2013 dollars used in the RIMS model. In 2013 dollars, MSBA spending in fiscal years 2005 through 2015 totaled \$9.23 billion.

Part II Methodology for Calculating Economic Impact of MSBA Funding³

The estimates for the impacts of spending on school building construction on the Massachusetts economy were derived using economic impact multipliers from the U.S. Bureau of Economic Analysis' Regional Input-Output Modeling System (RIMS II)⁴. Input-output modeling allows one to track the spending for an MSBA-funded project from the district to the prime contractor to the subcontractors and onto the range of suppliers who supply building materials and services to the project including all of the inputs that go into the production of these supplies. As such it permits a full accounting of the impacts of MSBA funding.

This type of model is widely-used by analysts to estimate the economic impact of development projects on a region. Vocabulary terms that are specific to input-output models are highlighted in bold the first time they appear below.

The BEA's Input-Output Model and RIMS II

The economic impact multipliers provided by the RIMS II model are derived by the BEA from the U.S. national input-output accounts. These accounts show the goods and services produced by each industry and the use of these goods and services by final users. These accounts are used to construct an input-output (I-O) model of the U.S. economy. This model is then adjusted to a regional level to account for the fact that many inputs at the regional level are imported from

outside the region. Finally, the BEA uses the regional model to construct the impact multipliers used in this study.

To understand how I-O accounts can be used to estimate an industry's economic impact on an economy, consider the workhorse of I-O analysis, the **direct requirements table**.

This table, derived from inter-industry transactions, is a two-dimensional table where the columns consist of producing industries, and the rows consist of supplying industries or sectors. Each column of the table describes the inputs required from each industry or sector to produce one dollar of output in the column industry. **Table 3** is a version of this BEA input-output table, aggregated to the sector level, taken directly from the U.S. I-O model. Notice that the sum of each column adds to one (1.0000), which reflects how each dollar of output – equivalent to gross revenue – is distributed to suppliers of goods and services to the producing sector.

Focus on the construction industry column (column 23), and consider an increase in **final demand** spending of \$10,000 on construction – say, of new schools. For the U.S., for the construction industry as a whole, each \$10,000 (multiplying all the figures in the column by 10,000) of construction output requires purchases of \$12 from industries supplying agriculture, forestry, fishing, and hunting products – probably clearing land of trees and so on. That \$10,000 of construction final demand also requires, according to the table, \$95 of mining products, \$21 dollars of utility services, and so on. Notice that the majority of purchases come from the manufacturing sector, \$2,325, and labor services, \$3,673. Gross profits in the construction industry are \$1,978 for each \$10,000 of output, and taxes paid to governments at all levels are \$71 per \$10,000 of output. All these purchases exhaust the \$10,000; that is, each dollar of output is accounted for.

This table is aggregated to the sector level. The BEA accounts actually contain much more detail, for example that the \$2,325 in manufacturing inputs consist of \$334 in non-metallic mineral products (such as cement), \$495 in fabricated metal products (such as steel), \$210 in electrical equipment, appliances, and components, etc. The input detail in the RIMS II accounts used for this analysis consists of 406 supplying industries in all.

The three highlighted rows at the bottom of the table with codes V001, V002, and V003 represent the “**value-added**” components of output. They are called “value-added” because these three components comprise the net addition to gross domestic output that result from each dollar of spending in the construction industry. Each \$10,000 of spending on construction adds \$3,673 in new wage and salary compensation to construction workers, \$71 in new tax revenues for governments, and \$1,978 in new profits to construction industry owners. These value-added components, \$5,712 in all, comprise what is called the “**direct impact**” on value added or gross domestic product in the economy. It represents the additional value of goods and services produced in the construction industry by an increase of \$10,000 in construction output. Equivalently, the direct impact is .5712 per dollar of construction spending.

The effect of \$10,000 in spending on construction output on the economy does not end there, however. Each of the inputs purchased by the construction industry must be supplied – and therefore produced – by the supplying industry, and this creates additional value added (or gross domestic product) in the economy. For example, using the manufacturing column of the direct requirements table, the \$2,325 of purchases from the manufacturing industry generates an **indirect impact** in the manufacturing industry of an additional \$781 in value-added ($=\$2325* [.1446+.0116+.1796]$). Each other supplying industry generates additional indirect impacts. Accounting for all of these supplying industries generates the first round of indirect

impacts. These indirect impacts continue for many rounds. For example, the manufacturing industry that supplies the construction industry generates additional value added in the industries that supply *it*, generating a second round of indirect impacts. Conceptually, these rounds of indirect impacts continue forever, but mathematically, each subsequent round adds less and less to value added, so that the sum of these rounds approaches an easily calculated limit – using matrix algebra. The sum of all these rounds of indirect impacts is simply called the indirect impact. It represents the total value added in the economy necessary to produce the initial increase in final demand for construction spending of \$10,000.

These impacts, expressed per dollar of the initial increase in final demand, are called **multipliers**. RIMS II produces three sets of **Type I** multipliers (see **Table 4**) for each industry, one for *value added*, one for *earnings* (the earnings part of value added), and one for *employment*, which is scaled to jobs per million dollars of the initial increase in demand. Continuing with the example of the construction industry, each set of the three multipliers for nonresidential construction contains one multiplier for each supplying industry. For example, the value-added multiplier for the construction industry reflects the direct and indirect impacts on value-added in the construction industry, while the value-added multiplier for the manufacturing sector and each other industry reflects the indirect impacts on value-added in that industry.

Based on the RIMS model, \$10,000 spent on the construction of a high school in Massachusetts results in total in-state direct and indirect value-added of \$7,589. The total direct and indirect value-added substantially exceeds the \$10,000, but much of it is received by workers and owners from out-of-state suppliers. Of the \$7,589 of value-added generated in Massachusetts, \$6,038 is generated in the construction industry itself. Another \$422 is generated by Massachusetts durable goods manufacturing companies; \$293 in wholesale trade services; almost

\$200 by professional, scientific, and technical services such as architects, designers, accountants, and lawyers; \$128 in real estate, rental, and leasing services; and nearly \$100 in nondurable goods manufacturing. Smaller amounts are generated in a range of industries from mining, utilities, transportation and warehousing, finance, waste services, and even health care, accommodations, and food service. When all of these are added up, one obtains the Type I multiplier for the high school construction project in the state.

The Type I earnings multipliers reflect the direct and indirect impacts of each dollar of spending in construction on the earnings part of value-added. Of the \$7,589 in value-added created by \$10,000 in final demand spending on construction, \$5,317 would be in the form of earnings paid to workers, and \$4,543 of that amount would be in earnings paid in the construction industry itself.

The Type I employment multipliers translate the earnings multipliers into jobs. This is accomplished by dividing the earnings impact in each industry by the ratio of annual earnings to average annual employment in that industry and region. These ratios are taken from the quarterly census of employment and wages (QCEW) and other sources. The QCEW data are taken from quarterly reports required by each employer that contributes to the unemployment insurance system. In order to avoid decimals with a large number of leading zeroes, these multipliers are scaled to jobs per million dollars of final demand spending. For example, the direct and indirect impact of a million dollars (\$1,000,000) of final demand spending in construction would result in the creation of 9.34 jobs, 7.93 of them in the construction industry itself.

Since the translation from earnings to jobs involves the ratio of annual earnings to average annual employment, the employment multipliers have the interpretation of job-years. For example, if the final demand spending were \$1 million per year, then the employment impact

would be to increase annual employment by 9.34 jobs. On the other hand, if it were \$1 million per month, then the annual employment impact would instead be 112 jobs (12×9.34); or if it were \$1 million spread over a period of 10 years, then the annual employment impact would instead be .934 jobs ($9.34/10$). In the case of this study, the direct and indirect impacts of \$9,228 million in spending by the MSBA (in 2013 dollars) would be the creation of 86,000 job-years. Since this spending occurred over a period of 11 years, the average annual employment impact would be about 7,800 jobs.

These Type I multipliers account for only the inter-industry effects (direct and indirect) of a final demand change. I-O models also can be used to estimate what the BEA calls the **induced impact**. This impact is the result of changes in final demand by households for consumption purchases that follow from households' increases in incomes due to the employment and earnings impacts given by the Type I multipliers. Thus, for example, induced spending includes the additional jobs and income generated within the region as a result of a construction worker buying a pickup truck, work clothing, or a restaurant meal with the income earned on the construction job.

The I-O model accomplishes this by adding a **household** column to the direct requirements table shown in **Table 3**. This column represents consumer spending per dollar of income. Unlike the other columns in the direct requirements table, the entries do not add to one because of income that goes to savings. The induced impacts are conceptually calculated in the same manner as the indirect impact. Each additional dollar of household income results in a change in final demand for each industry that "supplies" consumer spending. These impacts can also be expressed per dollar of the initial increase in final demand.

The **Type II** multipliers include these induced impacts in addition to the direct and indirect impacts given by the Type I multipliers. For school construction, the RIMS model estimates a

Type II valued-added multiplier of 1.1235 (see **Table 4**). For every \$10,000 originally spent on the construction of the high school, an additional \$524 of value-added accrues to the health care and social assistance sector as the result of purchases by both the construction workers on the school project as well as those whose incomes increased as a result of spending by the construction workers from the income they earned. Similarly, there is an increase of nearly \$469 in the value-added in the durable goods manufacturing sector; another \$430 in retail trade; and another \$119 in restaurants and drinking places.

The Type II earnings multipliers indicate that for each \$10,000 in final demand spending on construction, the direct, indirect and induced impacts increase earnings by \$7,100. Of that amount, \$4,562, or 64 percent, accrues to construction workers, while the remaining 36 percent of earnings are received by workers in other industries and sectors.

The Type II employment multipliers indicate that for each \$1 million in final demand spending on construction, the direct, indirect and induced employment impacts amount to 13.78 job-years, with about 58 percent of these in construction.

It is this induced spending that makes the original MSBA investments in school construction, renovation, and repair so valuable in terms of generating employment, earnings, and state tax revenue far beyond the construction project itself.

In sum, the impact of MSBA spending has three impacts on the economy. The **first** is the value-added, earnings, and employment *direct* impact of the initial spending on a construction, renovation, or repair project. This occurs through the construction industry itself and directly benefits construction workers, managers, and construction firms. The **second** is *indirect* and effects the workers, managers, and owners of firms in other industries that supply goods and services to the construction firms building or remodeling the district schools. This also includes

firms that supply the supplying firms such as the coal mine that supplies coal to a steel industry blast furnace which produces i-beams or re-bar for the school built in Massachusetts. Finally, the **third** impact is the *induced* effect that occurs when workers, managers, or investors building or renovating a school spend some of their earnings to buy all the things they purchase for their families. The assumption here is that if the worker was not employed, he or she would have less to spend and therefore the induced impact would not exist.

Accounting for Leakages to Other Regions

Since I-O models are usually used to estimate economic impacts of a change in final demand on a *region*, some account has to be made for demand that is fulfilled by suppliers *outside* the region. Demand that **leaks** to other regions affect those other regions' economies, but not the economy in the "originating" region. At the national level, this is handled by international trade accounts, so the numbers in the adjusted direct requirements table reflect only demand that is filled by suppliers located in the U.S. This means that the columns in this table no longer sum to one, but rather, to less than one, depending on how important imports are in each industry.⁵

At the subnational regional level (RIMS II provides multipliers at the level of states and counties), accounts that measure inter-regional flows within the U.S. do not exist, so the BEA uses another method to account for leakages to other regions. For each entry in the national adjusted direct requirements table (which has already been adjusted for leakages to other countries), the BEA applies a **location coefficient** for that supplying industry. The location coefficient for a regional industry is the ratio of that industry's share of regional wages and salaries divided by that industry's share of national wages and salaries. Thus a location coefficient of one indicates that the share of that industry's activity in the regional economy is the same as in the national economy, while a location coefficient greater than one indicates that that industry is more concentrated in the

region than the nation as a whole, and a location coefficient of less than one indicates that that industry is less concentrated in the region than the nation as a whole. If the industry's location coefficient is less than one, the entry in the regional direct requirements table is equal to the national adjusted direct requirements table multiplied by the location coefficient. If the industry's location coefficient is greater than or equal to one, the entry in the regional direct requirements table is equal to the national adjusted direct requirements table. The implication of this methodology is that, in supplying industries that are less concentrated than the nation as a whole, some proportion of the domestically (U.S.) produced inputs purchased from that industry originate from suppliers located outside the region, that proportion being one minus the location quotient.

The upshot is that both the **Type I** and **Type II** multipliers in **Table 4** reflect leakages to other states and countries. This simply reflects the reality that a large proportion of final demand is supplied by firms located outside the state.

The Assumption of No Supply Constraints

The RIMS II model assumes that there are no supply constraints. This means that inputs to production – labor, other services, and materials – can be obtained at the going market price without having to draw inputs away from other productive uses. For example, construction workers can be obtained without taking them away from other jobs; or if they do leave other jobs, the openings they create when they leave are filled by construction workers who are not working elsewhere in the economy. The same goes for material inputs. They are created with unused or new capacity. This assumption of no supply constraints is reasonable if the economy has unemployed resources: unemployed workers and excess production capacity. When this assumption is met, the impact estimates given by the model – for valued added, employment, and earnings – represent “new” economic activity.

Contrast this situation with one of a fully-employed economy. In this situation, resources can only be obtained by drawing them away from other uses. Hiring a construction worker, for example, means that he or she has to leave another job, for which there is no one to fill the now vacant position in their old job. Suppliers of materials have no excess capacity, so in order to supply one customer, they have to deny another. Similarly, capacity cannot be expanded without drawing the resources to build that capacity from other already-employed resources. Total employment, (real) value-added, and (real) earnings cannot increase, they are simply redistributed from some uses to other uses. Money incomes and prices may rise because projects are competing to hire inputs from other uses, but this is simply the result of inflation. When resources are already fully-employed, there cannot be new employment or new real output created. When the economy is fully-employed, the RIMS impact estimates due to a project for employment, value-added, and earnings are completely and exactly offset by equal reductions in employment, valued-added, and earnings in the rest of the economy.

These two situations and the effects on employment, real output and real incomes are displayed in **Figure 1**. The horizontal axis represents the quantity of inputs supplied, either labor, other services, materials; or a “composite” of all inputs. The vertical axis represents the price of the inputs. This figure applies to any or all inputs, but for clarity, simply consider labor for now.

In this figure, S_0 represents the economy’s aggregate supply curve. In the case of labor, it is the supply curve of labor. The horizontal portion reflects an economy with unemployed resources, and is consistent with the assumption of no supply constraints. The vertical portion of the supply curve represents a fully-employed economy. In such an economy the maximum possible amount of employment is the amount represented by the point E.

The figure includes several alternative demand curves. As spending on a project increases, the demand curve shifts toward the right. The demand curve D_0 is consistent with the RIMS assumption of no supply constraints. In this situation, the quantity of labor demanded and employed is given by the point A. If demand were to increase, the demand curve would shift right by amount of new labor demanded. As long as demand did not exceed that given by the demand curve D_1 , prices would not change – labor could be obtained at the going market price – and the RIMS labor impact of AB would reflect new employment.

In the region between B and E, the supply curve is neither horizontal nor vertical, representing an economy in which resources acquired for a project are neither fully unemployed nor fully employed. If demand were to increase from D_1 to D_2 , the RIMS employment impact would be BD – that is, employment estimated by the RIMS model would increase by the difference between D and B, but the actual increase in employment would only be BC. The RIMS estimate would overstate the actual impact on new jobs for two reasons:

1. Some of the employment would come from already employment workers who switch jobs. These job changers do not represent new employment.
2. Some of the new employment could only be obtained by higher wages needed to coax existing workers to work longer hours, or to attract new workers into the labor force. Since wages are higher, the budget for employment will pay for fewer workers than at the wage rate on the horizontal part of the supply curve.

In the region beyond E, the supply curve is vertical, representing a fully-employed economy. At point E, the aggregate demand curve is given by D_3 . Project spending would shift the demand curve to the right, but this would only result in higher prices (wage rates) and no new

employment. All employment for the project would simply reflect a shift of workers from other jobs to the project.

In fiscal years 2005-2008, the Massachusetts economy experienced nearly full employment, followed by several years of recession and recovery from the recession, FY2008-FY2014. By the end of the FY2015, the economy was approaching full employment once again. This means that aggregate demand during these years was shifting back and forth along the aggregate supply curve, from the region between E and B in the early years of the period, then in the region below B for most of the rest of the period, and finally back in the region between B and E in FY2015.

If we knew what the actual supply curves for labor and other inputs were, we could adjust RIMS impact estimates to obtain reliable estimates of the actual impacts on new employment, new (real) value-added, and new (real) earnings. Unfortunately, it would be a massive undertaking to estimate the supply curves needed. In the absence of this information, we have made a simple but reasonable assumption to enable a range of RIMS impact estimates, using the state's unemployment rate as a proxy for where aggregate demand lies on the aggregate supply curve. The upper bound of these estimates is given by the RIMS model impacts themselves. The lower bound of these estimates is determined by the unemployment rate in the following manner:

- At unemployment rates above 6 percent, we assume that the economy is on the horizontal portion of the supply curve, with sufficient unemployed labor and other inputs (excess production capacity) so that the RIMS model requirement of no supply constraints is very reasonably satisfied. At these high unemployment rates, the lower bound is the RIMS estimate itself.

- At unemployment rates below 4 percent, we assume that the economy is fully-employed on the vertical portion of the supply curve. At full employment, the lower bound of the RIMS estimate is zero for all impacts.

- For unemployment rates between 6 percent and 4 percent, we assume the economy is in the region between B and E on the aggregate supply curve. The lower-bound estimate is given by the proportional difference between the actual unemployment rate and 4 percent, relative to the difference between 6 percent and 4 percent. For example, if the unemployment rate were 5 percent, that is half-way between 6 percent and 4 percent, the lower-bound estimate would be half of the RIMS impact estimate. At an unemployment rate of 4.5 percent, the lower-bound estimate would be one-quarter of the RIMS impact estimate, etc.

The lower bound estimate is a very conservative estimate, since a vertical supply curve is an extreme that the economy has probably rarely achieved, if ever; and 4 percent is a conservatively high estimate for this lower bound⁶. For example, the state's unemployment rate dipped to 3.0 percent in 1987 and 2.6 percent in 2000. Yet, even at these very low unemployment rates, real economic output was still growing, if only for a brief period of time.

Moreover, as the economy approaches full employment, resources may pour into the state from other states or countries, shifting the supply curve to the right, as represented by the aggregate supply curve S1. Net in-migration to Massachusetts – and most other states – is typically procyclical. Workers tend to move to states where job opportunities are better; and private investment in productive inputs also tends to shift to regions where demand is increasing. So even if aggregate demand was on the vertical portion of the supply curve, as the situation given by D3 and S0, this high-demand situation could lead to an outward shift of the supply curve, for example, to S1, increasing the real economic impact on the economy from zero to EF.

For these reasons the lower-bound estimates given in this report should be interpreted literally as the lower limit of possible impacts. It is highly unlikely that the actual impacts would be lower or even as low as the lower bound. They are likely to be substantially higher. However, we cannot be certain where, between the lower and upper bounds, the actual impacts would lie.

Part III Economic Impacts on Value-Added (Real State Gross Domestic Product), Employment, and Earnings

The economic impacts of the MSBA funding during the FY2005-FY2015 period are summarized in the following tables. The total impacts for each table are calculated by applying the RIMS II multipliers in **Table 4** to the total MSBA funding in 2013 dollars of \$9,228 million. Impacts are displayed by economic sector and by fiscal year. In each table, the total impact is separated into two components:⁷

1. The direct impact on the construction industry in Massachusetts.
2. The sum of the indirect and induced impacts on the Massachusetts economy.

These estimates are presented in more detail in the Appendix Tables.

The Value-Added (Real Massachusetts Gross Domestic Product) Impact of MSBA Funding

The direct impact of total MSBA spending of \$9.23 billion (in 2013 dollars) between FY2005 and FY2015 reflects an addition to Massachusetts real gross domestic product of between \$3.49 billion and \$5.56 billion (also in 2013 dollars) by the construction industry during this period due directly to the construction, renovation, and repair of schools (see **Tables 5A** and **5B**). This is comprised primarily of wages and salaries paid to Massachusetts construction workers,

secondarily of profits to construction firm owners, and lastly of tax revenue paid to all levels of governments by the construction industry.

But that direct spending within the Commonwealth induced between another \$3.02 and \$4.81 billion in in-state value-added between FY2005 and FY2015. This represents value-added in industries supplying construction – the indirect impacts, plus value-added in industries providing goods and services to:

- workers in the construction industry,
- workers in the industries supplying construction, and
- workers in the industries supplying goods and services to these other workers.

These last three items comprise the induced impacts. The total direct, indirect, and induced value-added in Massachusetts amounted to between \$6.52 and \$10.37 billion. According to the input-output model, durable goods manufacturing firms in Massachusetts benefited to the tune of between \$272 million and \$433 million in value-added. Retailers value-added was increased by between \$250 and \$397 million; finance and insurance firms increased their value-added by between \$286 and \$455 million; while real estate, rental and leasing firms experienced a boost of between \$561 and \$892 million. Other winners were professional, scientific, and technical services (between \$233 and \$371 million); health care and social service providers (between \$304 and \$484 million); and wholesale trade (between \$283 and \$449 million).

The impacts by fiscal year are presented in **Table 5B**. The largest impacts occurred in fiscal years 2005 through 2007, due to the massive amount of construction activity in those years. Those were also years in which aggregate demand was relatively high and in which unemployment rates were the lowest in this 11-year period. Consequently, the range between the lower and upper bound

estimates is wide. In fiscal years 2007 and 2008, just prior to the Great Recession, the unemployment rate was 4.8 percent, so consequently the lower bound estimate is only about 40 percent of the upper bound estimate. During the years of the Great Recession and the first several years of the recovery, aggregate demand was weak, and unemployment rates exceeded 6 percent. There were no supply constraints during this time and so the upper and lower bounds estimates are the same. In FY2015, the sixth year of the economic expansion, the economy was beginning to approach full employment and supply constraints were beginning to kick in. The lower bound estimate in FY2015 is 62 percent of the upper bound estimate.

Because the RIMS model is linear, the ratios of the lower bound to upper bound estimates in the next to last column in **Table 5B** are the same for all the RIMS estimates. That is, these ratios by fiscal year are the same for employment and earnings; and also the same for direct, indirect, and induced impacts.

The Employment Impact of MSBA Funding

With such a large increment in value-added across a broad array of industries, the spending generated by MSBA-funded projects has created a large number of jobs during the 2005 to 2015 period. The additional jobs in construction were particularly critical during the period which included the Great Recession, in which total construction employment in Massachusetts plummeted from 141,200 in 2006 to 107,100 in 2010. As such, the large number of construction workers employed to construct, renovate, or repair district schools as a result of MSBA funding would likely have been otherwise unemployed. These workers would have had reduced purchasing power and many would be receiving state unemployment benefits rather than contributing income and sales tax revenue.

Tables 6A and 6B provide the input-output generated data for employment resulting from MSBA funding during this period. According to this analysis, between 45,900 and 73,100 construction job-years were created on these MSBA-funded projects between FY2005 and FY2015. Over this period, this would have raised construction employment by an average of

between 4,200 and 6,600 per year over what it would have been otherwise, which means that construction employment would have been about 4 percent lower during this time without MSBA funding. Reflecting the large amount of spending in the early years of this period, the highest annual job impacts occurred in fiscal years 2005 through 2007. In FY2006, the peak year for spending, between 8,900 and 20,100 new construction jobs were created building schools. During the Great Recession and the recovery, in fiscal years 2009-2014, the annual number of construction jobs created varied between 2,900 in FY2009 to 5,400 in FY2013. In FY2015, as supply constraints began to become effective, the number of new construction jobs created was between 2,600 and 4,200.

But these construction jobs comprised only about 57 percent of all jobs that were ultimately generated as a result of MSBA funding. The value-added generated in other sectors as a result of the indirect and induced impacts of MSBA funding provided between another 34,000 and 54,100 job-years in the Commonwealth for a total of between 80,000 and 127,200 job-years statewide. These included between 4,600 and 7,300 jobs in health care and social assistance⁸; between 4,500 and 7,200 jobs in retail trade; between 4,500 and 7,100 jobs in real estate and rental and leasing; and between 2,500 and 4,000 jobs in durable goods manufacturing.

In FY2006, the peak year for job impacts, between 15,500 and 35,000 new jobs were created throughout the economy. In every year of the Great Recession and the recovery that followed it, in fiscal years 2009 through 2014, more than 5,000 new jobs were created, ranging from between 5,000 in FY2009 to 9,400 jobs in FY2013. In FY2015, between 4,600 and 7,300 new jobs were created.

The Earnings Impact of MBSA Funding

Tables 7A and **7B** show that, of the \$9.23 billion of funding for school construction projects, between \$2.63 billion and \$4.18 billion went to pay workers in new construction jobs. This represents 75 percent of the direct impact value added created by MSBA spending. Indirect and induced earnings added between \$1.49 and \$2.37 billion, for total additional earnings generation of between \$4.12 and \$6.55 billion to Massachusetts workers during the 11-year period. Of the total of indirect plus induced earnings, between \$224 and \$356 million went to those who

worked in health care and social assistance; between \$156 and \$248 million went to those who worked in professional, scientific, and technical services; between \$143 and \$228 million went to workers in finance and insurance; and between \$133 and \$212 million went to durable goods manufacturing workers.

In line with the distribution of the value added and employment impacts over time, the biggest impacts were in fiscal years 2006 and 2007, with between \$796 million and \$1,803 million in additional total statewide earnings in FY2006 alone. In the most recent year of the analysis, FY2015, between \$235 and \$378 million in additional earnings income can be attributed to MSBA spending.

Part IV Impacts on State Tax Revenues

All of this economic activity generated a large amount of additional tax revenue for the Commonwealth. For this analysis, state tax revenue estimates are based on average relationships between tax revenue components and corresponding income and product account relationships over the 2005 through 2015 period, with special treatment for profit income, and for the sales tax exemption for spending on the construction of school building materials. Withholding revenues are based on the average ratio of state withholding tax revenues to wage and salary income. Sales tax revenues – with the exception of direct spending on school building materials – are based on the average ratio of state sales and excise tax collections to state gross domestic product. Business tax collections are based on the average ratio of state business taxes to state gross domestic product. The methodology for the estimation of these tax revenue impacts is given in more detail in an appendix.

Total state tax revenues generated in Massachusetts flowing from the MSBA funding between FY2005 and FY2015 are shown in **Table 8**. As a result of this infusion of direct and

induced earnings in the state, the Commonwealth's coffers benefited as well. Over this 11-year period, we estimate that additional income tax revenues of between \$264.4 million and \$420.6 million were generated. Of that amount, between \$199.3 million and \$317.1 million were from additional income withholding tax revenue, and between \$65.1 million and \$103.5 million were from non-withholding tax revenue, such as self-employed income; interest, dividends, and rent; or capital gains.

Additional sales tax revenues generated over the 11-year period amounted to between \$44.2 million and \$70.3 million. We assume that all construction spending for materials on new schools was exempt from the sales tax. The additional sales tax revenues derive from the indirect and induced economic activity generated by this construction.

Finally, there are business taxes based on the profits of Massachusetts firms. Based on historical relationships between state business tax revenues and state GDP, we estimate that new business tax revenues of between \$37.4 million and \$59.5 million were generated during the FY2005 - FY2015 period.

Adding all of these revenue streams together suggests that MSBA funding generated between \$346.0 million and \$550.3 million in tax revenue to the Commonwealth. As such, the net cost to the state of its investment in district schools was smaller by this amount than the gross cost.

Summary and Conclusions

Generally, when economists consider the economic impact of government programs on the aggregate economy, they focus on the role of federal policies. A good example of such "fiscal policy" would be the impact of federal highway dollars or the stimulus spending associated with the American Recovery and Reinvestment Act (ARRA) on national gross domestic product and

employment. But large-scale spending by state governments can have an impact at least on a regional economy. As this report has demonstrated, the \$7.6 billion infusion of funds into the construction, renovation, and repair of Massachusetts elementary, secondary, and vocational schools has had a large positive impact on output, employment, and earnings in the state.

Using input-output analysis the research described here was able to measure the direct, indirect, and induced effect of the funds granted to individual school districts by the Massachusetts School Building Authority over the period FY2005 through FY2015.

The \$7.58 billion in spending by the MSBA represented \$9.23 billion in real, 2013 dollars of spending. In real terms – all of the remaining figures below are in real 2013 dollars – this spending added between \$3.49 and \$5.56 billion of Massachusetts-supplied economic activity directly into the construction industry and its workforce within the state of Massachusetts. The remaining funds went to purchase construction materials and other necessary goods and services from firms operating in other states.

But that direct spending within the Commonwealth was responsible for indirect and induced spending of between another \$3.02 billion and \$4.81 billion spread across a wide variety of Massachusetts industries from manufacturing to retail trade providing a total addition to value-added within the state of between \$6.52 and \$10.37 billion.

With the economy in recession during much of this period and construction employment plummeting from 141,200 jobs in 2005 to 107,100 in 2010, the large infusion of MSBA funding provided an enormous boost in employment to what would have in many cases been unemployed workers. Altogether, between 45,900 and 73,100 job-years of employment were created on an MSBA project. According to our analysis, at any one time during the FY2005 to FY2015 period, there were approximately 5,000 Massachusetts construction workers on a school construction,

renovation, or repair site because of MSBA funding – roughly four percent of the total number of construction workers employed on all private and public construction projects in the state. And this was only about 60 percent of all the direct, indirect, and induced jobs that can be credited to MSBA projects. Between 34,000 and 54,100 other new jobs-years were generated in the course of supplying goods and services to these projects or were the result of spending by workers in construction, employees of firms supplying the construction industry, or employees of firms providing goods and services to these workers. Our best estimate of the total number of job-years that can be credited to MSBA programs is between 80,000 and 127,200. These are new jobs that were created as a result of the MSBA spending.

Such a large boost in employment obviously resulted in a substantial boost in total wages, salaries, and benefits earned by workers in the state, both those working on MSBA-funded construction sites or the indirect and induced result of spending on these projects. We estimate construction workers and managers working directly on MSBA-funded projects earned between \$2.63 billion and \$4.18 billion in wages, salaries, and benefits during the FY2005 to FY2015 period. Induced earnings from their spending of this income generated between another \$1.49 billion and \$2.37 billion in earnings for total new employment earnings of between \$4.12 and \$6.55 billion. These earnings went to workers in virtually all industrial sectors in the Commonwealth.

Finally, some of the MSBA funding came back to state coffers as a result of increased personal, sales, and business taxes. Our best estimate is that over the FY2005 to FY2015 period, the Massachusetts treasury received between \$264.4 million and \$420.6 million in additional personal income tax revenue, between \$44.2 million and \$70.3 million in additional sales and excise tax revenue, and between \$37.4 million and \$59.5 million in added business tax

revenue for a total of between \$346.0 and \$550.3 million. As such, the long term net cost to the state for MSBA programs is somewhat smaller than the gross cost.

It should also be pointed out that these estimates may be underestimates of the total economic impact of MSBA funding. If the existence of MSBA funds permitted local school districts to invest their own funds in school construction, renovation, or repair that would not have otherwise been undertaken, the total impact of MSBA funding could be even larger.

The bottom line is that MSBA funding activity not only leaves the Commonwealth with better schools for our children, but continues to play a not insignificant role in boosting the economy of the state, providing jobs for thousands and thousands of our workers.

Appendix: Methodology for Estimating State Tax Revenue Impacts

For this analysis, state tax revenue estimates are based on average relationships between tax revenue components and corresponding income and product account relationships over the 2005-2015 period, with special treatment for profit income, and for the sales tax exemption for spending on the construction of school building materials. Withholding revenues are based on the average ratio of state withholding tax revenues to wage and salary income. Sales tax revenues – with the exception of direct spending on school building materials – are based on the average ratio of state sales and excise tax collections to state gross domestic product. Business tax collections are based on the average ratio of state business taxes to state gross domestic product.

Massachusetts wage and salary income, and Massachusetts gross domestic product are from the U.S. Bureau of Economic Analysis, and Massachusetts state tax revenues are from the Massachusetts Department of Revenue. All estimates reported in the tables are in 2013 dollars.

Withholding Tax Revenue

The withholding tax revenue impact is equal to the average ratio of state withholding taxes to state wage and salary income over the 2005-2015 period, .048394, times the total earnings impact estimates.

Non-Withholding Personal Income Tax Revenue

The personal income impacts generated from construction spending are comprised of two components: wage and salary earnings, and profit income. Tax revenues derived from earnings are captured in withholding tax revenues. What remains are tax revenues derived from profit income. The profit income impact is calculated as the ratio of gross operating surplus (profits) to value-added, .3786⁹, times the total valued-added impact estimates. It is assumed that half of this profit income generated in Massachusetts was received by Massachusetts residents and therefore was taxable at the Part B state income tax rate. This rate averaged .05275 over the FY2005-FY2015 period.

Sales and Excise Tax Revenues

Sales and excise taxes are estimated as the average ratio of sales and excise tax revenues to state gross domestic product over the 2005-2015 period, .014619, times the indirect plus induced value-added impact. This excludes the direct value-added impact since that reflects direct spending on school construction which is exempt from state sales taxes.

Business Taxes

The business tax revenue impact is estimated as the average ratio of business tax revenues to state gross domestic product over the 2005-2015 period, of .005735, times the total value-added impact.

Figure 1
Aggregate Demand and Supply for Inputs to Production

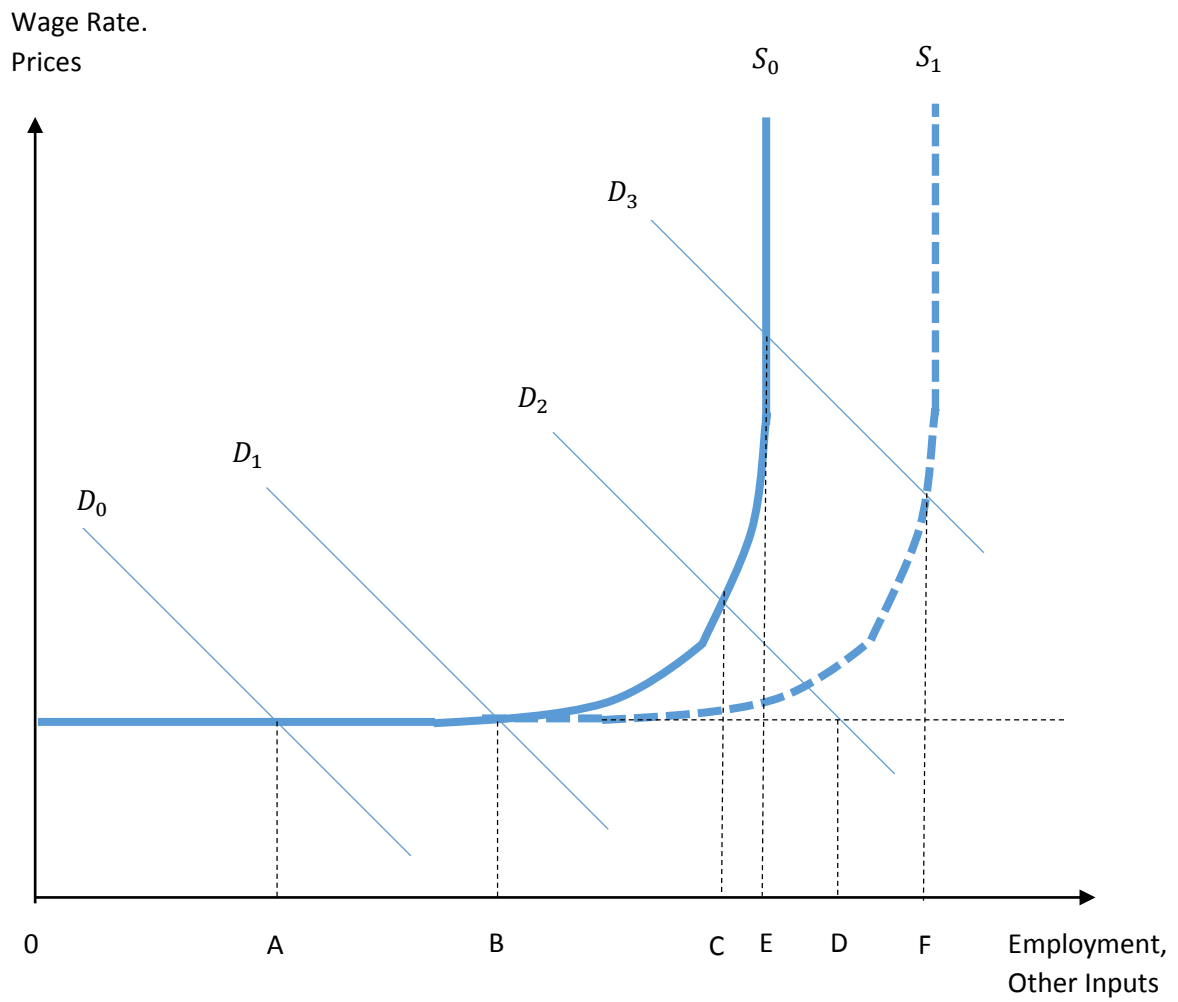


Table 1
MSBA Spending by Program Type and Fiscal Year

Project Type	FY05	FY06	FY07	FY08	FY09	FY10
Addition/Renovation	\$ 381,014,898.08	\$ 902,909,359.18	\$ 613,468,061.00	\$ 141,313,449.19	\$ 197,987,158.00	\$ 194,500,761.00
Accelerated Repair	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Green Repair	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 21,258.00
N/A	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 254,667.00
New Construction	\$ 285,287,739.80	\$ 762,100,150.67	\$ 529,511,366.00	\$ 205,918,954.59	\$ 128,581,481.00	\$ 149,418,421.00
New Construction - Model School	\$ -	\$ -	\$ -	\$ -	\$ 1,547,093.00	\$ 18,317,510.00
Repair-Major	\$ -	\$ 19,319,175.00	\$ 44,066,116.00	\$ 14,704,778.00	\$ 14,556,805.00	\$ 22,223,665.00
FY Total	\$ 666,302,637.88	\$ 1,684,328,684.85	\$ 1,187,045,543.00	\$ 361,937,181.78	\$ 342,672,537.00	\$ 384,736,282.00

Project Type	FY11	FY12	FY13	FY14	FY15	Grand Total
Addition/Renovation	\$ 121,837,389.00	\$ 169,268,302.00	\$ 185,988,030.00	\$ 203,636,694.00	\$ 199,630,418.00	\$ 3,311,554,519.45
Accelerated Repair	\$ -	\$ -	\$ 278,817.00	\$ 18,044,368.00	\$ 34,182,671.00	\$ 52,505,856.00
Green Repair	\$ 5,932,802.00	\$ 61,898,165.00	\$ 90,757,535.00	\$ 18,407,643.00	\$ 2,438,118.00	\$ 179,455,521.00
N/A	\$ 382,941.00	\$ 13,475.00	\$ 469,624.00	\$ 195,624.00	\$ 3,076,080.11	\$ 4,392,411.11
New Construction	\$ 180,482,982.00	\$ 271,928,091.00	\$ 245,135,094.00	\$ 216,221,060.00	\$ 265,341,500.06	\$ 3,239,926,840.13
New Construction - Model School	\$ 53,923,545.00	\$ 99,928,662.00	\$ 180,319,980.00	\$ 181,023,897.00	\$ 45,042,018.00	\$ 580,102,705.00
Repair-Major	\$ 18,670,609.00	\$ 11,481,914.00	\$ 24,220,185.00	\$ 20,380,304.00	\$ 21,342,013.00	\$ 210,965,564.00
FY Total	\$ 381,230,268.00	\$ 614,518,609.00	\$ 727,169,265.00	\$ 657,909,590.00	\$ 571,052,818.17	\$ 7,578,903,416.68

Source: Massachusetts School Building Authority

Table 2

MSBA Spending Adjusted for Waitlist Annual Payments and Construction Cost Inflation

Fiscal Year	Nominal Unallocated	Nominal Allocated	Price Deflator, 2013=100	Inflation Rate	Real Allocated
2005	666,302,638	696,895,356	0.6170	10.7%	1,129,441,728
2006	1,684,328,685	1,779,900,594	0.7010	13.6%	2,539,233,857
2007	1,187,045,543	1,236,157,730	0.7973	13.7%	1,550,410,423
2008	361,937,182	355,064,664	0.8418	5.6%	421,777,086
2009	342,672,537	335,864,546	0.9170	8.9%	366,260,793
2010	384,736,282	374,967,656	0.9225	0.6%	406,455,676
2011	381,230,268	355,787,304	0.9339	1.2%	380,959,351
2012	614,518,609	576,654,546	0.9740	4.3%	592,059,356
2013	727,169,265	671,711,710	0.9882	1.5%	679,736,319
2014	657,909,590	641,138,655	1.0195	3.2%	628,875,835
2015	571,052,818	554,760,656	1.0421	2.2%	532,342,610
Sum	7,578,903,417	7,578,903,417			9,227,553,034

Sources: MSBA; New School Construction Producer Price Index, BLS (2006 and later);
Nonresidential Structures GDP Deflator, BEA (pre 2006).

Table 3

Commodity-by-Industry Direct Requirements, After Redefinitions (selected industries)								
(in producers' prices)								
Bureau of Economic Analysis								
2012								
	Commodities/Industries	11	21	22	23	31G	81	G
IOCode	Name	Agriculture, forestry, fishing, and hunting	Mining	Utilities	Construction	Manufacturing	Other services, except government	Government
11	Agriculture, forestry, fishing, and hunting	0.1939	0.0002	0.0000	0.0012	0.0479	0.0001	0.0009
21	Mining	0.0046	0.0778	0.0757	0.0095	0.1017	0.0009	0.0057
22	Utilities	0.0089	0.0052	0.0064	0.0021	0.0103	0.0060	0.0090
23	Construction	0.0050	0.0083	0.0083	0.0001	0.0029	0.0055	0.0207
31G	Manufacturing	0.1797	0.0693	0.0622	0.2325	0.3374	0.0892	0.1140
42	Wholesale trade	0.0474	0.0105	0.0098	0.0365	0.0475	0.0141	0.0126
44RT	Retail trade	0.0003	0.0003	0.0007	0.0575	0.0023	0.0100	0.0001
48TW	Transportation and warehousing	0.0260	0.0167	0.0401	0.0166	0.0251	0.0086	0.0194
51	Information	0.0009	0.0012	0.0025	0.0036	0.0038	0.0132	0.0259
FIRE	Finance, insurance, real estate, rental, and leasing	0.0663	0.0223	0.0210	0.0240	0.0133	0.1150	0.0295
PROF	Professional and business services	0.0097	0.0418	0.0379	0.0357	0.0585	0.0605	0.0891
6	Educational services, health care, and social assistance	0.0008	0.0000	0.0003	0.0000	0.0000	0.0032	0.0108
7	Arts, entertainment, recreation, accommodation, and food services	0.0009	0.0011	0.0046	0.0018	0.0033	0.0050	0.0095
81	Other services, except government	0.0019	0.0008	0.0013	0.0041	0.0029	0.0098	0.0083
G	Government	0.0001	0.0000	0.0009	0.0000	0.0010	0.0027	0.0029
Used	Scrap, used and secondhand goods	-0.0001	0.0001	0.0002	0.0001	0.0029	0.0036	0.0000
Other	Noncomparable imports and rest-of-the-world adjustment	0.0018	0.0022	0.0029	0.0025	0.0035	0.0006	0.0056
V001	Compensation of employees	0.0968	0.1448	0.1847	0.3673	0.1446	0.4722	0.5113
V002	Taxes on production and imports, less subsidies	0.0058	0.0754	0.1608	0.0071	0.0116	0.0385	-0.0069
V003	Gross operating surplus	0.3494	0.5221	0.3797	0.1978	0.1796	0.1414	0.1317
	Total	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Legend / Footnotes:

Note. Detail may not add to total due to rounding.

Source: BEA RIMS II Input Output Model

Table 4
RIMS II Construction Industry Multipliers for Nonresidential Construction, Massachusetts, 2013

Sector	Value Added		Employment		Earnings	
	Type I	Type II	Type I	Type II	Type I	Type II
Agriculture, forestry, fishing, and hunting	0.0000	0.0005	0.0005	0.0069	0.0000	0.0003
Mining	0.0004	0.0005	0.0033	0.0036	0.0001	0.0001
Utilities	0.0018	0.0086	0.0043	0.0209	0.0005	0.0024
Construction	0.6038	0.6071	7.9302	7.9635	0.4543	0.4562
Durable goods manufacturing	0.0422	0.0469	0.3967	0.4349	0.0208	0.0230
Nondurable goods manufacturing	0.0098	0.0225	0.0858	0.1875	0.0049	0.0107
Wholesale trade	0.0293	0.0487	0.1690	0.2808	0.0125	0.0208
Retail trade	0.0072	0.0430	0.1264	0.7805	0.0037	0.0221
Transportation and warehousing	0.0052	0.0120	0.0635	0.1582	0.0032	0.0075
Information	0.0047	0.0215	0.0251	0.1050	0.0018	0.0075
Finance and insurance	0.0077	0.0493	0.0569	0.3823	0.0039	0.0247
Real estate and rental and leasing	0.0128	0.0967	0.0825	0.7686	0.0032	0.0213
Professional, scientific, and technical services	0.0199	0.0402	0.1873	0.3793	0.0136	0.0269
Management of companies and enterprises	0.0051	0.0114	0.0308	0.0685	0.0034	0.0075
Administrative and waste management services	0.0051	0.0159	0.0986	0.3098	0.0032	0.0100
Educational services	0.0001	0.0070	0.0020	0.1598	0.0001	0.0052
Health care and social assistance	0.0003	0.0524	0.0045	0.7930	0.0003	0.0386
Arts, entertainment, and recreation	0.0004	0.0047	0.0098	0.1314	0.0003	0.0030
Accommodation	0.0005	0.0049	0.0072	0.0654	0.0002	0.0021
Food services and drinking places	0.0008	0.0119	0.0252	0.3743	0.0005	0.0074
Other services	0.0018	0.0169	0.0300	0.3342	0.0012	0.0118
Households	0.0000	0.0009	0.0000	0.0727	0.0000	0.0009
Sum	0.7589	1.1235	9.3396	13.7811	0.5317	0.7100

Source: BEA RIMS II Input Output Model 2013

Table 5A
Value-Added Impacts by Sector
(Millions of 2013 Dollars)

Sector	Direct		Indirect + Induced		Total	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Agriculture, forestry, fishing, and hunting	0.0	0.0	2.9	4.6	2.9	4.6
Mining	0.0	0.0	2.9	4.6	2.9	4.6
Utilities	0.0	0.0	49.9	79.4	49.9	79.4
Construction	3,494.9	5,558.5	27.4	43.5	3,522.2	5,602.0
Durable goods manufacturing	0.0	0.0	272.1	432.8	272.1	432.8
Nondurable goods manufacturing	0.0	0.0	130.5	207.6	130.5	207.6
Wholesale trade	0.0	0.0	282.5	449.4	282.5	449.4
Retail trade	0.0	0.0	249.5	396.8	249.5	396.8
Transportation and warehousing	0.0	0.0	69.6	110.7	69.6	110.7
Information	0.0	0.0	124.7	198.4	124.7	198.4
Finance and insurance	0.0	0.0	286.0	454.9	286.0	454.9
Real estate and rental and leasing	0.0	0.0	561.0	892.3	561.0	892.3
Professional, scientific, and technical services	0.0	0.0	233.2	370.9	233.2	370.9
Management of companies and enterprises	0.0	0.0	66.1	105.2	66.1	105.2
Administrative and waste management services	0.0	0.0	92.2	146.7	92.2	146.7
Educational services	0.0	0.0	40.6	64.6	40.6	64.6
Health care and social assistance	0.0	0.0	304.0	483.5	304.0	483.5
Arts, entertainment, and recreation	0.0	0.0	27.3	43.4	27.3	43.4
Accommodation	0.0	0.0	28.4	45.2	28.4	45.2
Food services and drinking places	0.0	0.0	69.0	109.8	69.0	109.8
Other services	0.0	0.0	98.0	155.9	98.0	155.9
Households	0.0	0.0	5.2	8.3	5.2	8.3
Sum	3,494.9	5,558.5	3,023.4	4,808.6	6,518.2	10,367.2

Source: RIMS II model, MSBA, and authors' calculations.

Table 5B
Value Added Impacts by Fiscal Year
(Millions of 2013 Dollars)

Fiscal Year	Direct		Indirect + Induced		Total		Lower Bound as a % of Upper Bound	Unemployment Rate (%)
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound		
2005	309.0	680.4	267.3	588.6	576.3	1,268.9	45.4	4.9
2006	675.6	1,529.6	584.4	1,323.2	1,260.0	2,852.8	44.2	4.9
2007	369.7	933.9	319.8	807.9	689.5	1,741.9	39.6	4.8
2008	101.6	254.1	87.9	219.8	189.5	473.9	40.0	4.8
2009	220.6	220.6	190.9	190.9	411.5	411.5	100.0	7.0
2010	244.8	244.8	211.8	211.8	456.7	456.7	100.0	8.7
2011	229.5	229.5	198.5	198.5	428.0	428.0	100.0	7.7
2012	356.6	356.6	308.5	308.5	665.2	665.2	100.0	6.8
2013	409.5	409.5	354.2	354.2	763.7	763.7	100.0	6.7
2014	378.8	378.8	327.7	327.7	706.5	706.5	100.0	6.2
2015	199.1	320.7	172.2	277.4	371.3	598.1	62.1	5.2
Sum	3,494.9	5,558.5	3,023.4	4,808.6	6,518.2	10,367.2	62.9	

Source: RIMS II model, MSBA, and authors' calculations.

Table 6A
Employment Impacts by Sector
(Person Years)

Sector	Direct		Indirect + Induced		Total	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Agriculture, forestry, fishing, and hunting	0.0	0.0	40.0	63.7	40.0	63.7
Mining	0.0	0.0	20.9	33.2	20.9	33.2
Utilities	0.0	0.0	121.3	192.9	121.3	192.9
Construction	45,946.9	73,078.1	255.0	405.5	46,201.9	73,483.6
Durable goods manufacturing	0.0	0.0	2,523.2	4,013.1	2,523.2	4,013.1
Nondurable goods manufacturing	0.0	0.0	1,087.8	1,730.2	1,087.8	1,730.2
Wholesale trade	0.0	0.0	1,629.1	2,591.1	1,629.1	2,591.1
Retail trade	0.0	0.0	4,528.2	7,202.1	4,528.2	7,202.1
Transportation and warehousing	0.0	0.0	917.8	1,459.8	917.8	1,459.8
Information	0.0	0.0	609.2	968.9	609.2	968.9
Finance and insurance	0.0	0.0	2,218.0	3,527.7	2,218.0	3,527.7
Real estate and rental and leasing	0.0	0.0	4,459.2	7,092.3	4,459.2	7,092.3
Professional, scientific, and technical services	0.0	0.0	2,200.6	3,500.0	2,200.6	3,500.0
Management of companies and enterprises	0.0	0.0	397.4	632.1	397.4	632.1
Administrative and waste management services	0.0	0.0	1,797.4	2,858.7	1,797.4	2,858.7
Educational services	0.0	0.0	927.1	1,474.6	927.1	1,474.6
Health care and social assistance	0.0	0.0	4,600.8	7,317.4	4,600.8	7,317.4
Arts, entertainment, and recreation	0.0	0.0	762.3	1,212.5	762.3	1,212.5
Accommodation	0.0	0.0	379.4	603.5	379.4	603.5
Food services and drinking places	0.0	0.0	2,171.6	3,453.9	2,171.6	3,453.9
Other services	0.0	0.0	1,938.9	3,083.8	1,938.9	3,083.8
Households	0.0	0.0	421.8	670.8	421.8	670.8
Sum	45,946.9	73,078.1	34,007.0	54,087.7	79,953.9	127,165.8
Average Annual Employment Impact	4,177.0	6,643.5	3,091.5	4,917.1	7,268.5	11,560.5

Source: RIMS II model, MSBA, and authors' calculations.

Table 6B
 Employment Impacts by Fiscal Year
 (Person Years)

Fiscal Year	Direct		Indirect + Induced		Total	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
2005	4,062.4	8,944.7	3,006.7	6,620.3	7,069.1	15,564.9
2006	8,881.7	20,109.6	6,573.7	14,883.8	15,455.4	34,993.4
2007	4,860.3	12,278.6	3,597.3	9,087.8	8,457.5	21,366.4
2008	1,336.1	3,340.3	988.9	2,472.3	2,325.0	5,812.6
2009	2,900.6	2,900.6	2,146.9	2,146.9	5,047.5	5,047.5
2010	3,218.9	3,218.9	2,382.5	2,382.5	5,601.4	5,601.4
2011	3,017.0	3,017.0	2,233.0	2,233.0	5,250.0	5,250.0
2012	4,688.8	4,688.8	3,470.4	3,470.4	8,159.2	8,159.2
2013	5,383.2	5,383.2	3,984.3	3,984.3	9,367.5	9,367.5
2014	4,980.4	4,980.4	3,686.2	3,686.2	8,666.6	8,666.6
2015	2,617.4	4,215.9	1,937.2	3,120.4	4,554.6	7,336.3
Sum	45,946.9	73,078.1	34,007.0	54,087.7	79,953.9	127,165.8

Source: RIMS II model, MSBA, and authors' calculations.

Table 7A
Earnings Impacts by Sector
(Millions of 2013 Dollars)

Sector	Direct		Indirect + Induced		Total	
	Lower Bound	Uppper Bound	Lower Bound	Uppper Bound	Lower Bound	Uppper Bound
Agriculture, forestry, fishing, and hunting	0.0	0.0	1.7	2.8	1.7	2.8
Mining	0.0	0.0	0.6	0.9	0.6	0.9
Utilities	0.0	0.0	13.9	22.1	13.9	22.1
Construction	2,630.9	4,184.4	15.9	25.2	2,646.7	4,209.6
Durable goods manufacturing	0.0	0.0	133.4	212.2	133.4	212.2
Nondurable goods manufacturing	0.0	0.0	62.1	98.7	62.1	98.7
Wholesale trade	0.0	0.0	120.7	191.9	120.7	191.9
Retail trade	0.0	0.0	128.2	203.9	128.2	203.9
Transportation and warehousing	0.0	0.0	43.5	69.2	43.5	69.2
Information	0.0	0.0	43.5	69.2	43.5	69.2
Finance and insurance	0.0	0.0	143.3	227.9	143.3	227.9
Real estate and rental and leasing	0.0	0.0	123.6	196.5	123.6	196.5
Professional, scientific, and technical services	0.0	0.0	156.1	248.2	156.1	248.2
Management of companies and enterprises	0.0	0.0	43.5	69.2	43.5	69.2
Administrative and waste management services	0.0	0.0	58.0	92.3	58.0	92.3
Educational services	0.0	0.0	30.2	48.0	30.2	48.0
Health care and social assistance	0.0	0.0	223.9	356.2	223.9	356.2
Arts, entertainment, and recreation	0.0	0.0	17.4	27.7	17.4	27.7
Accommodation	0.0	0.0	12.2	19.4	12.2	19.4
Food services and drinking places	0.0	0.0	42.9	68.3	42.9	68.3
Other services	0.0	0.0	68.5	108.9	68.5	108.9
Households	0.0	0.0	5.2	8.3	5.2	8.3
Sum	2,630.9	4,184.4	1,488.3	2,367.2	4,119.2	6,551.6

Source: RIMS II model, MSBA, and authors' calculations.

Table 7B
Earnings Impacts by Fiscal Year
(Millions of 2013 Dollars)

Fiscal Year	Direct		Indirect + Induced		Total	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
2005	232.6	512.2	131.6	289.7	364.2	801.9
2006	508.6	1,151.5	287.7	651.4	796.3	1,802.9
2007	278.3	703.1	157.4	397.7	435.7	1,100.8
2008	76.5	191.3	43.3	108.2	119.8	299.5
2009	166.1	166.1	94.0	94.0	260.0	260.0
2010	184.3	184.3	104.3	104.3	288.6	288.6
2011	172.8	172.8	97.7	97.7	270.5	270.5
2012	268.5	268.5	151.9	151.9	420.4	420.4
2013	308.2	308.2	174.4	174.4	482.6	482.6
2014	285.2	285.2	161.3	161.3	446.5	446.5
2015	149.9	241.4	84.8	136.6	234.7	378.0
Sum	2,630.9	4,184.4	1,488.3	2,367.2	4,119.2	6,551.6

Source: RIMS II model, MSBA, and authors' calculations.

Table 8
 Massachusetts State Tax Revenue Generated by MSBA Spending (Millions of 2013 Dollars)

Fiscal Year	Withholding Tax		Non-Withholding Income		Sales and Excise		Business		Total	
	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
	2005	17.6	38.8	5.8	12.7	3.9	8.6	3.3	7.3	30.6
2006	38.5	87.2	12.6	28.5	8.5	19.3	7.2	16.4	66.9	151.4
2007	21.1	53.3	6.9	17.4	4.7	11.8	4.0	10.0	36.6	92.5
2008	5.8	14.5	1.9	4.7	1.3	3.2	1.1	2.7	10.1	25.2
2009	12.6	12.6	4.1	4.1	2.8	2.8	2.4	2.4	21.8	21.8
2010	14.0	14.0	4.6	4.6	3.1	3.1	2.6	2.6	24.2	24.2
2011	13.1	13.1	4.3	4.3	2.9	2.9	2.5	2.5	22.7	22.7
2012	20.3	20.3	6.6	6.6	4.5	4.5	3.8	3.8	35.3	35.3
2013	23.4	23.4	7.6	7.6	5.2	5.2	4.4	4.4	40.5	40.5
2014	21.6	21.6	7.1	7.1	4.8	4.8	4.1	4.1	37.5	37.5
2015	11.4	18.3	3.7	6.0	2.5	4.1	2.1	3.4	19.7	31.7
Sum	199.3	317.1	65.1	103.5	44.2	70.3	37.4	59.5	346.0	550.3

Addendum	Total Income Taxes	
	Lower Bound	Upper Bound
	264.4	420.6

Source:

Massachusetts School Building Authority, Massachusetts Department of Revenue, RIMS II, authors' calculations.

Appendix Tables

Value Added (Millions of 2013 Dollars) Lower Bound Total Impacts by Sector and Project Type

Sector	Addition/Renov ation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction	New Construction Model School	Repair Major	TOTAL
Agriculture, forestry, fishing, and hunting	1.2	0.0	0.1	0.0	1.2	0.3	0.1	2.9
Mining	1.2	0.0	0.1	0.0	1.2	0.3	0.1	2.9
Utilities	21.2	0.3	1.5	0.0	20.8	4.6	1.4	49.9
Construction	1,495.6	22.6	102.9	1.9	1,471.5	327.1	100.6	3,522.2
Durable goods manufacturing	115.5	1.7	7.9	0.1	113.7	25.3	7.8	272.1
Nondurable goods manufacturing	55.4	0.8	3.8	0.1	54.5	12.1	3.7	130.5
Wholesale trade	120.0	1.8	8.3	0.1	118.0	26.2	8.1	282.5
Retail trade	105.9	1.6	7.3	0.1	104.2	23.2	7.1	249.5
Transportation and warehousing	29.6	0.4	2.0	0.0	29.1	6.5	2.0	69.6
Information	53.0	0.8	3.6	0.1	52.1	11.6	3.6	124.7
Finance and insurance	121.5	1.8	8.4	0.2	119.5	26.6	8.2	286.0
Real estate and rental and leasing	238.2	3.6	16.4	0.3	234.4	52.1	16.0	561.0
Professional, scientific, and technical services	99.0	1.5	6.8	0.1	97.4	21.7	6.7	233.2
Management of companies and enterprises	28.1	0.4	1.9	0.0	27.6	6.1	1.9	66.1
Administrative and waste management services	39.2	0.6	2.7	0.0	38.5	8.6	2.6	92.2
Educational services	17.2	0.3	1.2	0.0	17.0	3.8	1.2	40.6
Health care and social assistance	129.1	2.0	8.9	0.2	127.0	28.2	8.7	304.0
Arts, entertainment, and recreation	11.6	0.2	0.8	0.0	11.4	2.5	0.8	27.3
Accommodation	12.1	0.2	0.8	0.0	11.9	2.6	0.8	28.4
Food services and drinking places	29.3	0.4	2.0	0.0	28.8	6.4	2.0	69.0
Other services	41.6	0.6	2.9	0.1	41.0	9.1	2.8	98.0
Households	2.2	0.0	0.2	0.0	2.2	0.5	0.1	5.2
TOTAL	2,767.8	41.9	190.4	3.5	2,723.2	605.4	186.2	6,518.2

Value Added (Millions of 2013 Dollars) Lower Bound Direct Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	1,484.0	22.5	102.1	1.8	1,460.1	324.6	99.8	3,494.9
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1,484.0	22.5	102.1	1.8	1,460.1	324.6	99.8	3,494.9

Value Added (Millions of 2013 Dollars) Lower Bound Indirect + Induced Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction	New Construction		Repair Major	TOTAL
						Model School			
Agriculture, forestry, fishing, and hunting	1.2	0.0	0.1	0.0	1.2	0.3		0.1	2.9
Mining	1.2	0.0	0.1	0.0	1.2	0.3		0.1	2.9
Utilities	21.2	0.3	1.5	0.0	20.8	4.6		1.4	49.9
Construction	11.6	0.2	0.8	0.0	11.4	2.5		0.8	27.4
Durable goods manufacturing	115.5	1.7	7.9	0.1	113.7	25.3		7.8	272.1
Nondurable goods manufacturing	55.4	0.8	3.8	0.1	54.5	12.1		3.7	130.5
Wholesale trade	120.0	1.8	8.3	0.1	118.0	26.2		8.1	282.5
Retail trade	105.9	1.6	7.3	0.1	104.2	23.2		7.1	249.5
Transportation and warehousing	29.6	0.4	2.0	0.0	29.1	6.5		2.0	69.6
Information	53.0	0.8	3.6	0.1	52.1	11.6		3.6	124.7
Finance and insurance	121.5	1.8	8.4	0.2	119.5	26.6		8.2	286.0
Real estate and rental and leasing	238.2	3.6	16.4	0.3	234.4	52.1		16.0	561.0
Professional, scientific, and technical services	99.0	1.5	6.8	0.1	97.4	21.7		6.7	233.2
Management of companies and enterprises	28.1	0.4	1.9	0.0	27.6	6.1		1.9	66.1
Administrative and waste management services	39.2	0.6	2.7	0.0	38.5	8.6		2.6	92.2
Educational services	17.2	0.3	1.2	0.0	17.0	3.8		1.2	40.6
Health care and social assistance	129.1	2.0	8.9	0.2	127.0	28.2		8.7	304.0
Arts, entertainment, and recreation	11.6	0.2	0.8	0.0	11.4	2.5		0.8	27.3
Accommodation	12.1	0.2	0.8	0.0	11.9	2.6		0.8	28.4
Food services and drinking places	29.3	0.4	2.0	0.0	28.8	6.4		2.0	69.0
Other services	41.6	0.6	2.9	0.1	41.0	9.1		2.8	98.0
Households	2.2	0.0	0.2	0.0	2.2	0.5		0.1	5.2
TOTAL	1,283.8	19.4	88.3	1.6	1,263.1	280.8		86.4	3,023.4

Employment (Person Years) Lower Bound Total Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	17.0	0.3	1.2	0.0	16.7	3.7	1.1	40.0
Mining	8.9	0.1	0.6	0.0	8.7	1.9	0.6	20.9
Utilities	51.5	0.8	3.5	0.1	50.7	11.3	3.5	121.3
Construction	19,618.3	297.0	1,349.3	24.5	19,302.2	4,291.0	1,319.8	46,201.9
Durable goods manufacturing	1,071.4	16.2	73.7	1.3	1,054.1	234.3	72.1	2,523.2
Nondurable goods manufacturing	461.9	7.0	31.8	0.6	454.5	101.0	31.1	1,087.8
Wholesale trade	691.8	10.5	47.6	0.9	680.6	151.3	46.5	1,629.1
Retail trade	1,922.8	29.1	132.2	2.4	1,891.8	420.6	129.4	4,528.2
Transportation and warehousing	389.7	5.9	26.8	0.5	383.5	85.2	26.2	917.8
Information	258.7	3.9	17.8	0.3	254.5	56.6	17.4	609.2
Finance and insurance	941.8	14.3	64.8	1.2	926.6	206.0	63.4	2,218.0
Real estate and rental and leasing	1,893.5	28.7	130.2	2.4	1,863.0	414.1	127.4	4,459.2
Professional, scientific, and technical services	934.4	14.1	64.3	1.2	919.4	204.4	62.9	2,200.6
Management of companies and enterprises	168.8	2.6	11.6	0.2	166.0	36.9	11.4	397.4
Administrative and waste management services	763.2	11.6	52.5	1.0	750.9	166.9	51.3	1,797.4
Educational services	393.7	6.0	27.1	0.5	387.3	86.1	26.5	927.1
Health care and social assistance	1,953.6	29.6	134.4	2.4	1,922.1	427.3	131.4	4,600.8
Arts, entertainment, and recreation	323.7	4.9	22.3	0.4	318.5	70.8	21.8	762.3
Accommodation	161.1	2.4	11.1	0.2	158.5	35.2	10.8	379.4
Food services and drinking places	922.1	14.0	63.4	1.1	907.2	201.7	62.0	2,171.6
Other services	823.3	12.5	56.6	1.0	810.0	180.1	55.4	1,938.9
Households	179.1	2.7	12.3	0.2	176.2	39.2	12.0	421.8
TOTAL	33,950.1	513.9	2,334.9	42.3	33,403.1	7,425.6	2,283.9	79,953.9

Employment (Person Years) Lower Bound Direct Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	19,510.0	295.3	1,341.8	24.3	19,195.7	4,267.3	1,312.5	45,946.9
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	19,510.0	295.3	1,341.8	24.3	19,195.7	4,267.3	1,312.5	45,946.9

Employment (Person Years) Lower Bound Indirect + Induced Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	17.0	0.3	1.2	0.0	16.7	3.7	1.1	40.0
Mining	8.9	0.1	0.6	0.0	8.7	1.9	0.6	20.9
Utilities	51.5	0.8	3.5	0.1	50.7	11.3	3.5	121.3
Construction	108.3	1.6	7.4	0.1	106.5	23.7	7.3	255.0
Durable goods manufacturing	1,071.4	16.2	73.7	1.3	1,054.1	234.3	72.1	2,523.2
Nondurable goods manufacturing	461.9	7.0	31.8	0.6	454.5	101.0	31.1	1,087.8
Wholesale trade	691.8	10.5	47.6	0.9	680.6	151.3	46.5	1,629.1
Retail trade	1,922.8	29.1	132.2	2.4	1,891.8	420.6	129.4	4,528.2
Transportation and warehousing	389.7	5.9	26.8	0.5	383.5	85.2	26.2	917.8
Information	258.7	3.9	17.8	0.3	254.5	56.6	17.4	609.2
Finance and insurance	941.8	14.3	64.8	1.2	926.6	206.0	63.4	2,218.0
Real estate and rental and leasing	1,893.5	28.7	130.2	2.4	1,863.0	414.1	127.4	4,459.2
Professional, scientific, and technical services	934.4	14.1	64.3	1.2	919.4	204.4	62.9	2,200.6
Management of companies and enterprises	168.8	2.6	11.6	0.2	166.0	36.9	11.4	397.4
Administrative and waste management services	763.2	11.6	52.5	1.0	750.9	166.9	51.3	1,797.4
Educational services	393.7	6.0	27.1	0.5	387.3	86.1	26.5	927.1
Health care and social assistance	1,953.6	29.6	134.4	2.4	1,922.1	427.3	131.4	4,600.8
Arts, entertainment, and recreation	323.7	4.9	22.3	0.4	318.5	70.8	21.8	762.3
Accommodation	161.1	2.4	11.1	0.2	158.5	35.2	10.8	379.4
Food services and drinking places	922.1	14.0	63.4	1.1	907.2	201.7	62.0	2,171.6
Other services	823.3	12.5	56.6	1.0	810.0	180.1	55.4	1,938.9
Households	179.1	2.7	12.3	0.2	176.2	39.2	12.0	421.8
TOTAL	14,440.1	218.6	993.1	18.0	14,207.4	3,158.4	971.4	34,007.0

Earnings (Millions of 2013 Dollars) Lower Bound Total Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	0.7	0.0	0.1	0.0	0.7	0.2	0.0	1.7
Mining	0.2	0.0	0.0	0.0	0.2	0.1	0.0	0.6
Utilities	5.9	0.1	0.4	0.0	5.8	1.3	0.4	13.9
Construction	1,123.9	17.0	77.3	1.4	1,105.8	245.8	75.6	2,646.7
Durable goods manufacturing	56.7	0.9	3.9	0.1	55.7	12.4	3.8	133.4
Nondurable goods manufacturing	26.4	0.4	1.8	0.0	25.9	5.8	1.8	62.1
Wholesale trade	51.2	0.8	3.5	0.1	50.4	11.2	3.4	120.7
Retail trade	54.4	0.8	3.7	0.1	53.6	11.9	3.7	128.2
Transportation and warehousing	18.5	0.3	1.3	0.0	18.2	4.0	1.2	43.5
Information	18.5	0.3	1.3	0.0	18.2	4.0	1.2	43.5
Finance and insurance	60.8	0.9	4.2	0.1	59.9	13.3	4.1	143.3
Real estate and rental and leasing	52.5	0.8	3.6	0.1	51.6	11.5	3.5	123.6
Professional, scientific, and technical services	66.3	1.0	4.6	0.1	65.2	14.5	4.5	156.1
Management of companies and enterprises	18.5	0.3	1.3	0.0	18.2	4.0	1.2	43.5
Administrative and waste management services	24.6	0.4	1.7	0.0	24.2	5.4	1.7	58.0
Educational services	12.8	0.2	0.9	0.0	12.6	2.8	0.9	30.2
Health care and social assistance	95.1	1.4	6.5	0.1	93.6	20.8	6.4	223.9
Arts, entertainment, and recreation	7.4	0.1	0.5	0.0	7.3	1.6	0.5	17.4
Accommodation	5.2	0.1	0.4	0.0	5.1	1.1	0.3	12.2
Food services and drinking places	18.2	0.3	1.3	0.0	17.9	4.0	1.2	42.9
Other services	29.1	0.4	2.0	0.0	28.6	6.4	2.0	68.5
Households	2.2	0.0	0.2	0.0	2.2	0.5	0.1	5.2
TOTAL	1,749.1	26.5	120.3	2.2	1,720.9	382.6	117.7	4,119.2

Earnings (Millions of 2013 Dollars) Lower Bound Direct Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction	New Construction		TOTAL
						Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	1,117.1	16.9	76.8	1.4	1,099.1	244.3	75.2	2,630.9
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1,117.1	16.9	76.8	1.4	1,099.1	244.3	75.2	2,630.9

Earnings (Millions of 2013 Dollars) Lower Bound Indirect + Induced Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	0.7	0.0	0.1	0.0	0.7	0.2	0.0	1.7
Mining	0.2	0.0	0.0	0.0	0.2	0.1	0.0	0.6
Utilities	5.9	0.1	0.4	0.0	5.8	1.3	0.4	13.9
Construction	6.7	0.1	0.5	0.0	6.6	1.5	0.5	15.9
Durable goods manufacturing	56.7	0.9	3.9	0.1	55.7	12.4	3.8	133.4
Nondurable goods manufacturing	26.4	0.4	1.8	0.0	25.9	5.8	1.8	62.1
Wholesale trade	51.2	0.8	3.5	0.1	50.4	11.2	3.4	120.7
Retail trade	54.4	0.8	3.7	0.1	53.6	11.9	3.7	128.2
Transportation and warehousing	18.5	0.3	1.3	0.0	18.2	4.0	1.2	43.5
Information	18.5	0.3	1.3	0.0	18.2	4.0	1.2	43.5
Finance and insurance	60.8	0.9	4.2	0.1	59.9	13.3	4.1	143.3
Real estate and rental and leasing	52.5	0.8	3.6	0.1	51.6	11.5	3.5	123.6
Professional, scientific, and technical services	66.3	1.0	4.6	0.1	65.2	14.5	4.5	156.1
Management of companies and enterprises	18.5	0.3	1.3	0.0	18.2	4.0	1.2	43.5
Administrative and waste management services	24.6	0.4	1.7	0.0	24.2	5.4	1.7	58.0
Educational services	12.8	0.2	0.9	0.0	12.6	2.8	0.9	30.2
Health care and social assistance	95.1	1.4	6.5	0.1	93.6	20.8	6.4	223.9
Arts, entertainment, and recreation	7.4	0.1	0.5	0.0	7.3	1.6	0.5	17.4
Accommodation	5.2	0.1	0.4	0.0	5.1	1.1	0.3	12.2
Food services and drinking places	18.2	0.3	1.3	0.0	17.9	4.0	1.2	42.9
Other services	29.1	0.4	2.0	0.0	28.6	6.4	2.0	68.5
Households	2.2	0.0	0.2	0.0	2.2	0.5	0.1	5.2
TOTAL	632.0	9.6	43.5	0.8	621.8	138.2	42.5	1,488.3

Value Added (Millions of 2013 Dollars) Lower Bound Total Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.3	0.6	0.3	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	2.9
Mining	0.3	0.6	0.3	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	2.9
Utilities	4.4	9.6	5.3	1.5	3.1	3.5	3.3	5.1	5.8	5.4	2.8	49.9
Construction	311.4	680.9	372.6	102.4	222.4	246.8	231.3	359.4	412.7	381.8	200.6	3,522.2
Durable goods manufacturing	24.1	52.6	28.8	7.9	17.2	19.1	17.9	27.8	31.9	29.5	15.5	272.1
Nondurable goods manufacturing	11.5	25.2	13.8	3.8	8.2	9.1	8.6	13.3	15.3	14.1	7.4	130.5
Wholesale trade	25.0	54.6	29.9	8.2	17.8	19.8	18.6	28.8	33.1	30.6	16.1	282.5
Retail trade	22.1	48.2	26.4	7.3	15.7	17.5	16.4	25.5	29.2	27.0	14.2	249.5
Transportation and warehousing	6.2	13.5	7.4	2.0	4.4	4.9	4.6	7.1	8.2	7.5	4.0	69.6
Information	11.0	24.1	13.2	3.6	7.9	8.7	8.2	12.7	14.6	13.5	7.1	124.7
Finance and insurance	25.3	55.3	30.3	8.3	18.1	20.0	18.8	29.2	33.5	31.0	16.3	286.0
Real estate and rental and leasing	49.6	108.4	59.3	16.3	35.4	39.3	36.8	57.3	65.7	60.8	32.0	561.0
Professional, scientific, and technical services	20.6	45.1	24.7	6.8	14.7	16.3	15.3	23.8	27.3	25.3	13.3	233.2
Management of companies and enterprises	5.8	12.8	7.0	1.9	4.2	4.6	4.3	6.7	7.7	7.2	3.8	66.1
Administrative and waste management services	8.2	17.8	9.8	2.7	5.8	6.5	6.1	9.4	10.8	10.0	5.3	92.2
Educational services	3.6	7.9	4.3	1.2	2.6	2.8	2.7	4.1	4.8	4.4	2.3	40.6
Health care and social assistance	26.9	58.8	32.2	8.8	19.2	21.3	20.0	31.0	35.6	33.0	17.3	304.0
Arts, entertainment, and recreation	2.4	5.3	2.9	0.8	1.7	1.9	1.8	2.8	3.2	3.0	1.6	27.3
Accommodation	2.5	5.5	3.0	0.8	1.8	2.0	1.9	2.9	3.3	3.1	1.6	28.4
Food services and drinking places	6.1	13.3	7.3	2.0	4.4	4.8	4.5	7.0	8.1	7.5	3.9	69.0
Other services	8.7	19.0	10.4	2.9	6.2	6.9	6.4	10.0	11.5	10.6	5.6	98.0
Households	0.5	1.0	0.6	0.2	0.3	0.4	0.3	0.5	0.6	0.6	0.3	5.2
TOTAL	576.3	1,260.0	689.5	189.5	411.5	456.7	428.0	665.2	763.7	706.5	371.3	6,518.2

Value Added (Millions of 2013 Dollars) Lower Bound Direct Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	309.0	675.6	369.7	101.6	220.6	244.8	229.5	356.6	409.5	378.8	199.1	3,494.9
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	309.0	675.6	369.7	101.6	220.6	244.8	229.5	356.6	409.5	378.8	199.1	3,494.9

Value Added (Millions of 2013 Dollars) Lower Bound Indirect + Induced Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.3	0.6	0.3	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	2.9
Mining	0.3	0.6	0.3	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	2.9
Utilities	4.4	9.6	5.3	1.5	3.1	3.5	3.3	5.1	5.8	5.4	2.8	49.9
Construction	2.4	5.3	2.9	0.8	1.7	1.9	1.8	2.8	3.2	3.0	1.6	27.4
Durable goods manufacturing	24.1	52.6	28.8	7.9	17.2	19.1	17.9	27.8	31.9	29.5	15.5	272.1
Nondurable goods manufacturing	11.5	25.2	13.8	3.8	8.2	9.1	8.6	13.3	15.3	14.1	7.4	130.5
Wholesale trade	25.0	54.6	29.9	8.2	17.8	19.8	18.6	28.8	33.1	30.6	16.1	282.5
Retail trade	22.1	48.2	26.4	7.3	15.7	17.5	16.4	25.5	29.2	27.0	14.2	249.5
Transportation and warehousing	6.2	13.5	7.4	2.0	4.4	4.9	4.6	7.1	8.2	7.5	4.0	69.6
Information	11.0	24.1	13.2	3.6	7.9	8.7	8.2	12.7	14.6	13.5	7.1	124.7
Finance and insurance	25.3	55.3	30.3	8.3	18.1	20.0	18.8	29.2	33.5	31.0	16.3	286.0
Real estate and rental and leasing	49.6	108.4	59.3	16.3	35.4	39.3	36.8	57.3	65.7	60.8	32.0	561.0
Professional, scientific, and technical services	20.6	45.1	24.7	6.8	14.7	16.3	15.3	23.8	27.3	25.3	13.3	233.2
Management of companies and enterprises	5.8	12.8	7.0	1.9	4.2	4.6	4.3	6.7	7.7	7.2	3.8	66.1
Administrative and waste management services	8.2	17.8	9.8	2.7	5.8	6.5	6.1	9.4	10.8	10.0	5.3	92.2
Educational services	3.6	7.9	4.3	1.2	2.6	2.8	2.7	4.1	4.8	4.4	2.3	40.6
Health care and social assistance	26.9	58.8	32.2	8.8	19.2	21.3	20.0	31.0	35.6	33.0	17.3	304.0
Arts, entertainment, and recreation	2.4	5.3	2.9	0.8	1.7	1.9	1.8	2.8	3.2	3.0	1.6	27.3
Accommodation	2.5	5.5	3.0	0.8	1.8	2.0	1.9	2.9	3.3	3.1	1.6	28.4
Food services and drinking places	6.1	13.3	7.3	2.0	4.4	4.8	4.5	7.0	8.1	7.5	3.9	69.0
Other services	8.7	19.0	10.4	2.9	6.2	6.9	6.4	10.0	11.5	10.6	5.6	98.0
Households	0.5	1.0	0.6	0.2	0.3	0.4	0.3	0.5	0.6	0.6	0.3	5.2
TOTAL	267.3	584.4	319.8	87.9	190.9	211.8	198.5	308.5	354.2	327.7	172.2	3,023.4

Employment (Person Years) Lower Bound Total Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	3.5	7.7	4.2	1.2	2.5	2.8	2.6	4.1	4.7	4.3	2.3	40.0
Mining	1.8	4.0	2.2	0.6	1.3	1.5	1.4	2.1	2.4	2.3	1.2	20.9
Utilities	10.7	23.4	12.8	3.5	7.7	8.5	8.0	12.4	14.2	13.1	6.9	121.3
Construction	4,084.9	8,931.0	4,887.2	1,343.5	2,916.7	3,236.8	3,033.8	4,714.9	5,413.1	5,008.1	2,631.9	46,201.9
Durable goods manufacturing	223.1	487.7	266.9	73.4	159.3	176.8	165.7	257.5	295.6	273.5	143.7	2,523.2
Nondurable goods manufacturing	96.2	210.3	115.1	31.6	68.7	76.2	71.4	111.0	127.5	117.9	62.0	1,087.8
Wholesale trade	144.0	314.9	172.3	47.4	102.8	114.1	107.0	166.3	190.9	176.6	92.8	1,629.1
Retail trade	400.4	875.3	479.0	131.7	285.9	317.2	297.3	462.1	530.5	490.8	258.0	4,528.2
Transportation and warehousing	81.1	177.4	97.1	26.7	57.9	64.3	60.3	93.7	107.5	99.5	52.3	917.8
Information	53.9	117.8	64.4	17.7	38.5	42.7	40.0	62.2	71.4	66.0	34.7	609.2
Finance and insurance	196.1	428.7	234.6	64.5	140.0	155.4	145.6	226.3	259.9	240.4	126.3	2,218.0
Real estate and rental and leasing	394.3	862.0	471.7	129.7	281.5	312.4	292.8	455.1	522.4	483.4	254.0	4,459.2
Professional, scientific, and technical services	194.6	425.4	232.8	64.0	138.9	154.2	144.5	224.6	257.8	238.5	125.4	2,200.6
Management of companies and enterprises	35.1	76.8	42.0	11.6	25.1	27.8	26.1	40.6	46.6	43.1	22.6	397.4
Administrative and waste management services	158.9	347.4	190.1	52.3	113.5	125.9	118.0	183.4	210.6	194.8	102.4	1,797.4
Educational services	82.0	179.2	98.1	27.0	58.5	65.0	60.9	94.6	108.6	100.5	52.8	927.1
Health care and social assistance	406.8	889.3	486.7	133.8	290.4	322.3	302.1	469.5	539.0	498.7	262.1	4,600.8
Arts, entertainment, and recreation	67.4	147.4	80.6	22.2	48.1	53.4	50.1	77.8	89.3	82.6	43.4	762.3
Accommodation	33.5	73.3	40.1	11.0	24.0	26.6	24.9	38.7	44.5	41.1	21.6	379.4
Food services and drinking places	192.0	419.8	229.7	63.1	137.1	152.1	142.6	221.6	254.4	235.4	123.7	2,171.6
Other services	171.4	374.8	205.1	56.4	122.4	135.8	127.3	197.9	227.2	210.2	110.5	1,938.9
Households	37.3	81.5	44.6	12.3	26.6	29.5	27.7	43.0	49.4	45.7	24.0	421.8
TOTAL	7,069.1	15,455.4	8,457.5	2,325.0	5,047.5	5,601.4	5,250.0	8,159.2	9,367.5	8,666.6	4,554.6	79,953.9

Employment (Person Years) Lower Bound Direct Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	4,062.4	8,881.7	4,860.3	1,336.1	2,900.6	3,218.9	3,017.0	4,688.8	5,383.2	4,980.4	2,617.4	45,946.9
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	4,062.4	8,881.7	4,860.3	1,336.1	2,900.6	3,218.9	3,017.0	4,688.8	5,383.2	4,980.4	2,617.4	45,946.9

Employment (Person Years) Lower Bound Indirect + Induced Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	3.5	7.7	4.2	1.2	2.5	2.8	2.6	4.1	4.7	4.3	2.3	40.0
Mining	1.8	4.0	2.2	0.6	1.3	1.5	1.4	2.1	2.4	2.3	1.2	20.9
Utilities	10.7	23.4	12.8	3.5	7.7	8.5	8.0	12.4	14.2	13.1	6.9	121.3
Construction	22.5	49.3	27.0	7.4	16.1	17.9	16.7	26.0	29.9	27.6	14.5	255.0
Durable goods manufacturing	223.1	487.7	266.9	73.4	159.3	176.8	165.7	257.5	295.6	273.5	143.7	2,523.2
Nondurable goods manufacturing	96.2	210.3	115.1	31.6	68.7	76.2	71.4	111.0	127.5	117.9	62.0	1,087.8
Wholesale trade	144.0	314.9	172.3	47.4	102.8	114.1	107.0	166.3	190.9	176.6	92.8	1,629.1
Retail trade	400.4	875.3	479.0	131.7	285.9	317.2	297.3	462.1	530.5	490.8	258.0	4,528.2
Transportation and warehousing	81.1	177.4	97.1	26.7	57.9	64.3	60.3	93.7	107.5	99.5	52.3	917.8
Information	53.9	117.8	64.4	17.7	38.5	42.7	40.0	62.2	71.4	66.0	34.7	609.2
Finance and insurance	196.1	428.7	234.6	64.5	140.0	155.4	145.6	226.3	259.9	240.4	126.3	2,218.0
Real estate and rental and leasing	394.3	862.0	471.7	129.7	281.5	312.4	292.8	455.1	522.4	483.4	254.0	4,459.2
Professional, scientific, and technical services	194.6	425.4	232.8	64.0	138.9	154.2	144.5	224.6	257.8	238.5	125.4	2,200.6
Management of companies and enterprises	35.1	76.8	42.0	11.6	25.1	27.8	26.1	40.6	46.6	43.1	22.6	397.4
Administrative and waste management services	158.9	347.4	190.1	52.3	113.5	125.9	118.0	183.4	210.6	194.8	102.4	1,797.4
Educational services	82.0	179.2	98.1	27.0	58.5	65.0	60.9	94.6	108.6	100.5	52.8	927.1
Health care and social assistance	406.8	889.3	486.7	133.8	290.4	322.3	302.1	469.5	539.0	498.7	262.1	4,600.8
Arts, entertainment, and recreation	67.4	147.4	80.6	22.2	48.1	53.4	50.1	77.8	89.3	82.6	43.4	762.3
Accommodation	33.5	73.3	40.1	11.0	24.0	26.6	24.9	38.7	44.5	41.1	21.6	379.4
Food services and drinking places	192.0	419.8	229.7	63.1	137.1	152.1	142.6	221.6	254.4	235.4	123.7	2,171.6
Other services	171.4	374.8	205.1	56.4	122.4	135.8	127.3	197.9	227.2	210.2	110.5	1,938.9
Households	37.3	81.5	44.6	12.3	26.6	29.5	27.7	43.0	49.4	45.7	24.0	421.8
TOTAL	3,006.7	6,573.7	3,597.3	988.9	2,146.9	2,382.5	2,233.0	3,470.4	3,984.3	3,686.2	1,937.2	34,007.0

Earnings (Millions of 2013 Dollars) Lower Bound Total Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	1.7
Mining	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.6
Utilities	1.2	2.7	1.5	0.4	0.9	1.0	0.9	1.4	1.6	1.5	0.8	13.9
Construction	234.0	511.6	280.0	77.0	167.1	185.4	173.8	270.1	310.1	286.9	150.8	2,646.7
Durable goods manufacturing	11.8	25.8	14.1	3.9	8.4	9.3	8.8	13.6	15.6	14.5	7.6	133.4
Nondurable goods manufacturing	5.5	12.0	6.6	1.8	3.9	4.3	4.1	6.3	7.3	6.7	3.5	62.1
Wholesale trade	10.7	23.3	12.8	3.5	7.6	8.5	7.9	12.3	14.1	13.1	6.9	120.7
Retail trade	11.3	24.8	13.6	3.7	8.1	9.0	8.4	13.1	15.0	13.9	7.3	128.2
Transportation and warehousing	3.8	8.4	4.6	1.3	2.7	3.0	2.9	4.4	5.1	4.7	2.5	43.5
Information	3.8	8.4	4.6	1.3	2.7	3.0	2.9	4.4	5.1	4.7	2.5	43.5
Finance and insurance	12.7	27.7	15.2	4.2	9.0	10.0	9.4	14.6	16.8	15.5	8.2	143.3
Real estate and rental and leasing	10.9	23.9	13.1	3.6	7.8	8.7	8.1	12.6	14.5	13.4	7.0	123.6
Professional, scientific, and technical services	13.8	30.2	16.5	4.5	9.9	10.9	10.2	15.9	18.3	16.9	8.9	156.1
Management of companies and enterprises	3.8	8.4	4.6	1.3	2.7	3.0	2.9	4.4	5.1	4.7	2.5	43.5
Administrative and waste management services	5.1	11.2	6.1	1.7	3.7	4.1	3.8	5.9	6.8	6.3	3.3	58.0
Educational services	2.7	5.8	3.2	0.9	1.9	2.1	2.0	3.1	3.5	3.3	1.7	30.2
Health care and social assistance	19.8	43.3	23.7	6.5	14.1	15.7	14.7	22.9	26.2	24.3	12.8	223.9
Arts, entertainment, and recreation	1.5	3.4	1.8	0.5	1.1	1.2	1.1	1.8	2.0	1.9	1.0	17.4
Accommodation	1.1	2.4	1.3	0.4	0.8	0.9	0.8	1.2	1.4	1.3	0.7	12.2
Food services and drinking places	3.8	8.3	4.5	1.2	2.7	3.0	2.8	4.4	5.0	4.7	2.4	42.9
Other services	6.1	13.2	7.2	2.0	4.3	4.8	4.5	7.0	8.0	7.4	3.9	68.5
Households	0.5	1.0	0.6	0.2	0.3	0.4	0.3	0.5	0.6	0.6	0.3	5.2
TOTAL	364.2	796.3	435.7	119.8	260.0	288.6	270.5	420.4	482.6	446.5	234.7	4,119.2

Earnings (Millions of 2013 Dollars) Lower Bound Direct Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	232.6	508.6	278.3	76.5	166.1	184.3	172.8	268.5	308.2	285.2	149.9	2,630.9
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	232.6	508.6	278.3	76.5	166.1	184.3	172.8	268.5	308.2	285.2	149.9	2,630.9

Earnings (Millions of 2013 Dollars) Lower Bound Indirect + Induced Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	1.7
Mining	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.6
Utilities	1.2	2.7	1.5	0.4	0.9	1.0	0.9	1.4	1.6	1.5	0.8	13.9
Construction	1.4	3.1	1.7	0.5	1.0	1.1	1.0	1.6	1.9	1.7	0.9	15.9
Durable goods manufacturing	11.8	25.8	14.1	3.9	8.4	9.3	8.8	13.6	15.6	14.5	7.6	133.4
Nondurable goods manufacturing	5.5	12.0	6.6	1.8	3.9	4.3	4.1	6.3	7.3	6.7	3.5	62.1
Wholesale trade	10.7	23.3	12.8	3.5	7.6	8.5	7.9	12.3	14.1	13.1	6.9	120.7
Retail trade	11.3	24.8	13.6	3.7	8.1	9.0	8.4	13.1	15.0	13.9	7.3	128.2
Transportation and warehousing	3.8	8.4	4.6	1.3	2.7	3.0	2.9	4.4	5.1	4.7	2.5	43.5
Information	3.8	8.4	4.6	1.3	2.7	3.0	2.9	4.4	5.1	4.7	2.5	43.5
Finance and insurance	12.7	27.7	15.2	4.2	9.0	10.0	9.4	14.6	16.8	15.5	8.2	143.3
Real estate and rental and leasing	10.9	23.9	13.1	3.6	7.8	8.7	8.1	12.6	14.5	13.4	7.0	123.6
Professional, scientific, and technical services	13.8	30.2	16.5	4.5	9.9	10.9	10.2	15.9	18.3	16.9	8.9	156.1
Management of companies and enterprises	3.8	8.4	4.6	1.3	2.7	3.0	2.9	4.4	5.1	4.7	2.5	43.5
Administrative and waste management services	5.1	11.2	6.1	1.7	3.7	4.1	3.8	5.9	6.8	6.3	3.3	58.0
Educational services	2.7	5.8	3.2	0.9	1.9	2.1	2.0	3.1	3.5	3.3	1.7	30.2
Health care and social assistance	19.8	43.3	23.7	6.5	14.1	15.7	14.7	22.9	26.2	24.3	12.8	223.9
Arts, entertainment, and recreation	1.5	3.4	1.8	0.5	1.1	1.2	1.1	1.8	2.0	1.9	1.0	17.4
Accommodation	1.1	2.4	1.3	0.4	0.8	0.9	0.8	1.2	1.4	1.3	0.7	12.2
Food services and drinking places	3.8	8.3	4.5	1.2	2.7	3.0	2.8	4.4	5.0	4.7	2.4	42.9
Other services	6.1	13.2	7.2	2.0	4.3	4.8	4.5	7.0	8.0	7.4	3.9	68.5
Households	0.5	1.0	0.6	0.2	0.3	0.4	0.3	0.5	0.6	0.6	0.3	5.2
TOTAL	131.6	287.7	157.4	43.3	94.0	104.3	97.7	151.9	174.4	161.3	84.8	1,488.3

Value Added (Millions of 2013 Dollars) Upper Bound Total Impacts by Sector and Project Type

Sector	Addition/Renov ation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction	New Construction		TOTAL
						Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	2.1	0.0	0.1	0.0	2.0	0.3	0.1	4.6
Mining	2.1	0.0	0.1	0.0	2.0	0.3	0.1	4.6
Utilities	36.4	0.4	1.5	0.0	34.3	4.8	2.0	79.4
Construction	2,567.7	30.0	103.4	2.5	2,419.2	336.8	142.4	5,602.0
Durable goods manufacturing	198.4	2.3	8.0	0.2	186.9	26.0	11.0	432.8
Nondurable goods manufacturing	95.2	1.1	3.8	0.1	89.7	12.5	5.3	207.6
Wholesale trade	206.0	2.4	8.3	0.2	194.1	27.0	11.4	449.4
Retail trade	181.9	2.1	7.3	0.2	171.3	23.9	10.1	396.8
Transportation and warehousing	50.8	0.6	2.0	0.0	47.8	6.7	2.8	110.7
Information	90.9	1.1	3.7	0.1	85.7	11.9	5.0	198.4
Finance and insurance	208.5	2.4	8.4	0.2	196.5	27.3	11.6	454.9
Real estate and rental and leasing	409.0	4.8	16.5	0.4	385.3	53.6	22.7	892.3
Professional, scientific, and technical services	170.0	2.0	6.8	0.2	160.2	22.3	9.4	370.9
Management of companies and enterprises	48.2	0.6	1.9	0.0	45.4	6.3	2.7	105.2
Administrative and waste management services	67.2	0.8	2.7	0.1	63.4	8.8	3.7	146.7
Educational services	29.6	0.3	1.2	0.0	27.9	3.9	1.6	64.6
Health care and social assistance	221.6	2.6	8.9	0.2	208.8	29.1	12.3	483.5
Arts, entertainment, and recreation	19.9	0.2	0.8	0.0	18.7	2.6	1.1	43.4
Accommodation	20.7	0.2	0.8	0.0	19.5	2.7	1.1	45.2
Food services and drinking places	50.3	0.6	2.0	0.0	47.4	6.6	2.8	109.8
Other services	71.5	0.8	2.9	0.1	67.3	9.4	4.0	155.9
Households	3.8	0.0	0.2	0.0	3.6	0.5	0.2	8.3
TOTAL	4,751.9	55.5	191.3	4.7	4,477.0	623.3	263.6	10,367.2

Value Added (Millions of 2013 Dollars) Upper Bound Direct Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	2,547.8	29.7	102.6	2.5	2,400.4	334.2	141.3	5,558.5
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	2,547.8	29.7	102.6	2.5	2,400.4	334.2	141.3	5,558.5

Value Added (Millions of 2013 Dollars) Upper Bound Indirect + Induced Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction	New Construction		Repair Major	TOTAL
						Model School			
Agriculture, forestry, fishing, and hunting	2.1	0.0	0.1	0.0	2.0	0.3		0.1	4.6
Mining	2.1	0.0	0.1	0.0	2.0	0.3		0.1	4.6
Utilities	36.4	0.4	1.5	0.0	34.3	4.8		2.0	79.4
Construction	19.9	0.2	0.8	0.0	18.8	2.6		1.1	43.5
Durable goods manufacturing	198.4	2.3	8.0	0.2	186.9	26.0		11.0	432.8
Nondurable goods manufacturing	95.2	1.1	3.8	0.1	89.7	12.5		5.3	207.6
Wholesale trade	206.0	2.4	8.3	0.2	194.1	27.0		11.4	449.4
Retail trade	181.9	2.1	7.3	0.2	171.3	23.9		10.1	396.8
Transportation and warehousing	50.8	0.6	2.0	0.0	47.8	6.7		2.8	110.7
Information	90.9	1.1	3.7	0.1	85.7	11.9		5.0	198.4
Finance and insurance	208.5	2.4	8.4	0.2	196.5	27.3		11.6	454.9
Real estate and rental and leasing	409.0	4.8	16.5	0.4	385.3	53.6		22.7	892.3
Professional, scientific, and technical services	170.0	2.0	6.8	0.2	160.2	22.3		9.4	370.9
Management of companies and enterprises	48.2	0.6	1.9	0.0	45.4	6.3		2.7	105.2
Administrative and waste management services	67.2	0.8	2.7	0.1	63.4	8.8		3.7	146.7
Educational services	29.6	0.3	1.2	0.0	27.9	3.9		1.6	64.6
Health care and social assistance	221.6	2.6	8.9	0.2	208.8	29.1		12.3	483.5
Arts, entertainment, and recreation	19.9	0.2	0.8	0.0	18.7	2.6		1.1	43.4
Accommodation	20.7	0.2	0.8	0.0	19.5	2.7		1.1	45.2
Food services and drinking places	50.3	0.6	2.0	0.0	47.4	6.6		2.8	109.8
Other services	71.5	0.8	2.9	0.1	67.3	9.4		4.0	155.9
Households	3.8	0.0	0.2	0.0	3.6	0.5		0.2	8.3
TOTAL	2,204.1	25.7	88.7	2.2	2,076.6	289.1		122.2	4,808.6

Employment (Person Years) Upper Bound Total Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	29.2	0.3	1.2	0.0	27.5	3.8	1.6	63.7
Mining	15.2	0.2	0.6	0.0	14.3	2.0	0.8	33.2
Utilities	88.4	1.0	3.6	0.1	83.3	11.6	4.9	192.9
Construction	33,681.7	393.2	1,356.1	33.1	31,733.6	4,417.7	1,868.2	73,483.6
Durable goods manufacturing	1,839.4	21.5	74.1	1.8	1,733.0	241.3	102.0	4,013.1
Nondurable goods manufacturing	793.0	9.3	31.9	0.8	747.2	104.0	44.0	1,730.2
Wholesale trade	1,187.6	13.9	47.8	1.2	1,119.0	155.8	65.9	2,591.1
Retail trade	3,301.1	38.5	132.9	3.2	3,110.2	433.0	183.1	7,202.1
Transportation and warehousing	669.1	7.8	26.9	0.7	630.4	87.8	37.1	1,459.8
Information	444.1	5.2	17.9	0.4	418.4	58.2	24.6	968.9
Finance and insurance	1,616.9	18.9	65.1	1.6	1,523.4	212.1	89.7	3,527.7
Real estate and rental and leasing	3,250.8	37.9	130.9	3.2	3,062.8	426.4	180.3	7,092.3
Professional, scientific, and technical services	1,604.3	18.7	64.6	1.6	1,511.5	210.4	89.0	3,500.0
Management of companies and enterprises	289.7	3.4	11.7	0.3	273.0	38.0	16.1	632.1
Administrative and waste management services	1,310.3	15.3	52.8	1.3	1,234.5	171.9	72.7	2,858.7
Educational services	675.9	7.9	27.2	0.7	636.8	88.6	37.5	1,474.6
Health care and social assistance	3,354.0	39.2	135.0	3.3	3,160.0	439.9	186.0	7,317.4
Arts, entertainment, and recreation	555.8	6.5	22.4	0.5	523.6	72.9	30.8	1,212.5
Accommodation	276.6	3.2	11.1	0.3	260.6	36.3	15.3	603.5
Food services and drinking places	1,583.1	18.5	63.7	1.6	1,491.5	207.6	87.8	3,453.9
Other services	1,413.5	16.5	56.9	1.4	1,331.7	185.4	78.4	3,083.8
Households	307.5	3.6	12.4	0.3	289.7	40.3	17.1	670.8
TOTAL	58,287.4	680.4	2,346.8	57.3	54,916.0	7,645.0	3,232.9	127,165.8

Employment (Person Years) Upper Bound Direct Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction	New Construction		TOTAL
						Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	33,495.9	391.0	1,348.6	32.9	31,558.4	4,393.4	1,857.8	73,078.1
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	33,495.9	391.0	1,348.6	32.9	31,558.4	4,393.4	1,857.8	73,078.1

Employment (Person Years) Upper Bound Indirect + Induced Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	29.2	0.3	1.2	0.0	27.5	3.8	1.6	63.7
Mining	15.2	0.2	0.6	0.0	14.3	2.0	0.8	33.2
Utilities	88.4	1.0	3.6	0.1	83.3	11.6	4.9	192.9
Construction	185.9	2.2	7.5	0.2	175.1	24.4	10.3	405.5
Durable goods manufacturing	1,839.4	21.5	74.1	1.8	1,733.0	241.3	102.0	4,013.1
Nondurable goods manufacturing	793.0	9.3	31.9	0.8	747.2	104.0	44.0	1,730.2
Wholesale trade	1,187.6	13.9	47.8	1.2	1,119.0	155.8	65.9	2,591.1
Retail trade	3,301.1	38.5	132.9	3.2	3,110.2	433.0	183.1	7,202.1
Transportation and warehousing	669.1	7.8	26.9	0.7	630.4	87.8	37.1	1,459.8
Information	444.1	5.2	17.9	0.4	418.4	58.2	24.6	968.9
Finance and insurance	1,616.9	18.9	65.1	1.6	1,523.4	212.1	89.7	3,527.7
Real estate and rental and leasing	3,250.8	37.9	130.9	3.2	3,062.8	426.4	180.3	7,092.3
Professional, scientific, and technical services	1,604.3	18.7	64.6	1.6	1,511.5	210.4	89.0	3,500.0
Management of companies and enterprises	289.7	3.4	11.7	0.3	273.0	38.0	16.1	632.1
Administrative and waste management services	1,310.3	15.3	52.8	1.3	1,234.5	171.9	72.7	2,858.7
Educational services	675.9	7.9	27.2	0.7	636.8	88.6	37.5	1,474.6
Health care and social assistance	3,354.0	39.2	135.0	3.3	3,160.0	439.9	186.0	7,317.4
Arts, entertainment, and recreation	555.8	6.5	22.4	0.5	523.6	72.9	30.8	1,212.5
Accommodation	276.6	3.2	11.1	0.3	260.6	36.3	15.3	603.5
Food services and drinking places	1,583.1	18.5	63.7	1.6	1,491.5	207.6	87.8	3,453.9
Other services	1,413.5	16.5	56.9	1.4	1,331.7	185.4	78.4	3,083.8
Households	307.5	3.6	12.4	0.3	289.7	40.3	17.1	670.8
TOTAL	24,791.5	289.4	998.2	24.4	23,357.5	3,251.7	1,375.1	54,087.7

Earnings (Millions of 2013 Dollars) Upper Bound Total Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction			TOTAL
					New Construction	Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	1.3	0.0	0.1	0.0	1.2	0.2	0.1	2.8
Mining	0.4	0.0	0.0	0.0	0.4	0.1	0.0	0.9
Utilities	10.2	0.1	0.4	0.0	9.6	1.3	0.6	22.1
Construction	1,929.5	22.5	77.7	1.9	1,817.9	253.1	107.0	4,209.6
Durable goods manufacturing	97.3	1.1	3.9	0.1	91.7	12.8	5.4	212.2
Nondurable goods manufacturing	45.3	0.5	1.8	0.0	42.6	5.9	2.5	98.7
Wholesale trade	88.0	1.0	3.5	0.1	82.9	11.5	4.9	191.9
Retail trade	93.5	1.1	3.8	0.1	88.1	12.3	5.2	203.9
Transportation and warehousing	31.7	0.4	1.3	0.0	29.9	4.2	1.8	69.2
Information	31.7	0.4	1.3	0.0	29.9	4.2	1.8	69.2
Finance and insurance	104.5	1.2	4.2	0.1	98.4	13.7	5.8	227.9
Real estate and rental and leasing	90.1	1.1	3.6	0.1	84.9	11.8	5.0	196.5
Professional, scientific, and technical services	113.8	1.3	4.6	0.1	107.2	14.9	6.3	248.2
Management of companies and enterprises	31.7	0.4	1.3	0.0	29.9	4.2	1.8	69.2
Administrative and waste management services	42.3	0.5	1.7	0.0	39.8	5.5	2.3	92.3
Educational services	22.0	0.3	0.9	0.0	20.7	2.9	1.2	48.0
Health care and social assistance	163.3	1.9	6.6	0.2	153.8	21.4	9.1	356.2
Arts, entertainment, and recreation	12.7	0.1	0.5	0.0	12.0	1.7	0.7	27.7
Accommodation	8.9	0.1	0.4	0.0	8.4	1.2	0.5	19.4
Food services and drinking places	31.3	0.4	1.3	0.0	29.5	4.1	1.7	68.3
Other services	49.9	0.6	2.0	0.0	47.0	6.5	2.8	108.9
Households	3.8	0.0	0.2	0.0	3.6	0.5	0.2	8.3
TOTAL	3,003.0	35.1	120.9	3.0	2,829.3	393.9	166.6	6,551.6

Earnings (Millions of 2013 Dollars) Upper Bound Direct Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated Repair	Green Repair	Other No Fixed Scope	New Construction	New Construction		TOTAL
						Model School	Repair Major	
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	1,917.9	22.4	77.2	1.9	1,807.0	251.6	106.4	4,184.4
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1,917.9	22.4	77.2	1.9	1,807.0	251.6	106.4	4,184.4

Earnings (Millions of 2013 Dollars) Upper Bound Indirect + Induced Impacts by Sector and Project Type

Sector	Addition/Renovation	Accelerated			Other No Fixed Scope	New Construction	New Construction		TOTAL
		Repair	Green Repair	Repair Major			Model School		
Agriculture, forestry, fishing, and hunting	1.3	0.0	0.1	0.0	1.2	0.2	0.1	2.8	
Mining	0.4	0.0	0.0	0.0	0.4	0.1	0.0	0.9	
Utilities	10.2	0.1	0.4	0.0	9.6	1.3	0.6	22.1	
Construction	11.6	0.1	0.5	0.0	10.9	1.5	0.6	25.2	
Durable goods manufacturing	97.3	1.1	3.9	0.1	91.7	12.8	5.4	212.2	
Nondurable goods manufacturing	45.3	0.5	1.8	0.0	42.6	5.9	2.5	98.7	
Wholesale trade	88.0	1.0	3.5	0.1	82.9	11.5	4.9	191.9	
Retail trade	93.5	1.1	3.8	0.1	88.1	12.3	5.2	203.9	
Transportation and warehousing	31.7	0.4	1.3	0.0	29.9	4.2	1.8	69.2	
Information	31.7	0.4	1.3	0.0	29.9	4.2	1.8	69.2	
Finance and insurance	104.5	1.2	4.2	0.1	98.4	13.7	5.8	227.9	
Real estate and rental and leasing	90.1	1.1	3.6	0.1	84.9	11.8	5.0	196.5	
Professional, scientific, and technical services	113.8	1.3	4.6	0.1	107.2	14.9	6.3	248.2	
Management of companies and enterprises	31.7	0.4	1.3	0.0	29.9	4.2	1.8	69.2	
Administrative and waste management services	42.3	0.5	1.7	0.0	39.8	5.5	2.3	92.3	
Educational services	22.0	0.3	0.9	0.0	20.7	2.9	1.2	48.0	
Health care and social assistance	163.3	1.9	6.6	0.2	153.8	21.4	9.1	356.2	
Arts, entertainment, and recreation	12.7	0.1	0.5	0.0	12.0	1.7	0.7	27.7	
Accommodation	8.9	0.1	0.4	0.0	8.4	1.2	0.5	19.4	
Food services and drinking places	31.3	0.4	1.3	0.0	29.5	4.1	1.7	68.3	
Other services	49.9	0.6	2.0	0.0	47.0	6.5	2.8	108.9	
Households	3.8	0.0	0.2	0.0	3.6	0.5	0.2	8.3	
TOTAL	1,085.0	12.7	43.7	1.1	1,022.3	142.3	60.2	2,367.2	

Value Added (Millions of 2013 Dollars) Upper Bound Total Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.6	1.3	0.8	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	4.6
Mining	0.6	1.3	0.8	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	4.6
Utilities	9.7	21.8	13.3	3.6	3.1	3.5	3.3	5.1	5.8	5.4	4.6	79.4
Construction	685.7	1,541.6	941.3	256.1	222.4	246.8	231.3	359.4	412.7	381.8	323.2	5,602.0
Durable goods manufacturing	53.0	119.1	72.7	19.8	17.2	19.1	17.9	27.8	31.9	29.5	25.0	432.8
Nondurable goods manufacturing	25.4	57.1	34.9	9.5	8.2	9.1	8.6	13.3	15.3	14.1	12.0	207.6
Wholesale trade	55.0	123.7	75.5	20.5	17.8	19.8	18.6	28.8	33.1	30.6	25.9	449.4
Retail trade	48.6	109.2	66.7	18.1	15.7	17.5	16.4	25.5	29.2	27.0	22.9	396.8
Transportation and warehousing	13.6	30.5	18.6	5.1	4.4	4.9	4.6	7.1	8.2	7.5	6.4	110.7
Information	24.3	54.6	33.3	9.1	7.9	8.7	8.2	12.7	14.6	13.5	11.4	198.4
Finance and insurance	55.7	125.2	76.4	20.8	18.1	20.0	18.8	29.2	33.5	31.0	26.2	454.9
Real estate and rental and leasing	109.2	245.5	149.9	40.8	35.4	39.3	36.8	57.3	65.7	60.8	51.5	892.3
Professional, scientific, and technical services	45.4	102.1	62.3	17.0	14.7	16.3	15.3	23.8	27.3	25.3	21.4	370.9
Management of companies and enterprises	12.9	28.9	17.7	4.8	4.2	4.6	4.3	6.7	7.7	7.2	6.1	105.2
Administrative and waste management services	18.0	40.4	24.7	6.7	5.8	6.5	6.1	9.4	10.8	10.0	8.5	146.7
Educational services	7.9	17.8	10.9	3.0	2.6	2.8	2.7	4.1	4.8	4.4	3.7	64.6
Health care and social assistance	59.2	133.1	81.2	22.1	19.2	21.3	20.0	31.0	35.6	33.0	27.9	483.5
Arts, entertainment, and recreation	5.3	11.9	7.3	2.0	1.7	1.9	1.8	2.8	3.2	3.0	2.5	43.4
Accommodation	5.5	12.4	7.6	2.1	1.8	2.0	1.9	2.9	3.3	3.1	2.6	45.2
Food services and drinking places	13.4	30.2	18.4	5.0	4.4	4.8	4.5	7.0	8.1	7.5	6.3	109.8
Other services	19.1	42.9	26.2	7.1	6.2	6.9	6.4	10.0	11.5	10.6	9.0	155.9
Households	1.0	2.3	1.4	0.4	0.3	0.4	0.3	0.5	0.6	0.6	0.5	8.3
TOTAL	1,268.9	2,852.8	1,741.9	473.9	411.5	456.7	428.0	665.2	763.7	706.5	598.1	10,367.2
Lower Bound	576.3	1,260.0	689.5	189.5	411.5	456.7	428.0	665.2	763.7	706.5	371.3	6,518.2
Ratio	0.45	0.44	0.40	0.40	1.00	1.00	1.00	1.00	1.00	1.00	0.62	0.63

Value Added (Millions of 2013 Dollars) Upper Bound Direct Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	680.4	1,529.6	933.9	254.1	220.6	244.8	229.5	356.6	409.5	378.8	320.7	5,558.5
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	680.4	1,529.6	933.9	254.1	220.6	244.8	229.5	356.6	409.5	378.8	320.7	5,558.5

Value Added (Millions of 2013 Dollars) Upper Bound Indirect + Induced Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.6	1.3	0.8	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	4.6
Mining	0.6	1.3	0.8	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	4.6
Utilities	9.7	21.8	13.3	3.6	3.1	3.5	3.3	5.1	5.8	5.4	4.6	79.4
Construction	5.3	12.0	7.3	2.0	1.7	1.9	1.8	2.8	3.2	3.0	2.5	43.5
Durable goods manufacturing	53.0	119.1	72.7	19.8	17.2	19.1	17.9	27.8	31.9	29.5	25.0	432.8
Nondurable goods manufacturing	25.4	57.1	34.9	9.5	8.2	9.1	8.6	13.3	15.3	14.1	12.0	207.6
Wholesale trade	55.0	123.7	75.5	20.5	17.8	19.8	18.6	28.8	33.1	30.6	25.9	449.4
Retail trade	48.6	109.2	66.7	18.1	15.7	17.5	16.4	25.5	29.2	27.0	22.9	396.8
Transportation and warehousing	13.6	30.5	18.6	5.1	4.4	4.9	4.6	7.1	8.2	7.5	6.4	110.7
Information	24.3	54.6	33.3	9.1	7.9	8.7	8.2	12.7	14.6	13.5	11.4	198.4
Finance and insurance	55.7	125.2	76.4	20.8	18.1	20.0	18.8	29.2	33.5	31.0	26.2	454.9
Real estate and rental and leasing	109.2	245.5	149.9	40.8	35.4	39.3	36.8	57.3	65.7	60.8	51.5	892.3
Professional, scientific, and technical services	45.4	102.1	62.3	17.0	14.7	16.3	15.3	23.8	27.3	25.3	21.4	370.9
Management of companies and enterprises	12.9	28.9	17.7	4.8	4.2	4.6	4.3	6.7	7.7	7.2	6.1	105.2
Administrative and waste management services	18.0	40.4	24.7	6.7	5.8	6.5	6.1	9.4	10.8	10.0	8.5	146.7
Educational services	7.9	17.8	10.9	3.0	2.6	2.8	2.7	4.1	4.8	4.4	3.7	64.6
Health care and social assistance	59.2	133.1	81.2	22.1	19.2	21.3	20.0	31.0	35.6	33.0	27.9	483.5
Arts, entertainment, and recreation	5.3	11.9	7.3	2.0	1.7	1.9	1.8	2.8	3.2	3.0	2.5	43.4
Accommodation	5.5	12.4	7.6	2.1	1.8	2.0	1.9	2.9	3.3	3.1	2.6	45.2
Food services and drinking places	13.4	30.2	18.4	5.0	4.4	4.8	4.5	7.0	8.1	7.5	6.3	109.8
Other services	19.1	42.9	26.2	7.1	6.2	6.9	6.4	10.0	11.5	10.6	9.0	155.9
Households	1.0	2.3	1.4	0.4	0.3	0.4	0.3	0.5	0.6	0.6	0.5	8.3
TOTAL	588.6	1,323.2	807.9	219.8	190.9	211.8	198.5	308.5	354.2	327.7	277.4	4,808.6

Employment (Person Years) Upper Bound Total Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	7.8	17.5	10.7	2.9	2.5	2.8	2.6	4.1	4.7	4.3	3.7	63.7
Mining	4.1	9.1	5.6	1.5	1.3	1.5	1.4	2.1	2.4	2.3	1.9	33.2
Utilities	23.6	53.1	32.4	8.8	7.7	8.5	8.0	12.4	14.2	13.1	11.1	192.9
Construction	8,994.3	20,221.2	12,346.7	3,358.8	2,916.7	3,236.8	3,033.8	4,714.9	5,413.1	5,008.1	4,239.3	73,483.6
Durable goods manufacturing	491.2	1,104.3	674.3	183.4	159.3	176.8	165.7	257.5	295.6	273.5	231.5	4,013.1
Nondurable goods manufacturing	211.8	476.1	290.7	79.1	68.7	76.2	71.4	111.0	127.5	117.9	99.8	1,730.2
Wholesale trade	317.1	713.0	435.4	118.4	102.8	114.1	107.0	166.3	190.9	176.6	149.5	2,591.1
Retail trade	881.5	1,981.9	1,210.1	329.2	285.9	317.2	297.3	462.1	530.5	490.8	415.5	7,202.1
Transportation and warehousing	178.7	401.7	245.3	66.7	57.9	64.3	60.3	93.7	107.5	99.5	84.2	1,459.8
Information	118.6	266.6	162.8	44.3	38.5	42.7	40.0	62.2	71.4	66.0	55.9	968.9
Finance and insurance	431.8	970.7	592.7	161.2	140.0	155.4	145.6	226.3	259.9	240.4	203.5	3,527.7
Real estate and rental and leasing	868.1	1,951.7	1,191.6	324.2	281.5	312.4	292.8	455.1	522.4	483.4	409.2	7,092.3
Professional, scientific, and technical services	428.4	963.1	588.1	160.0	138.9	154.2	144.5	224.6	257.8	238.5	201.9	3,500.0
Management of companies and enterprises	77.4	173.9	106.2	28.9	25.1	27.8	26.1	40.6	46.6	43.1	36.5	632.1
Administrative and waste management services	349.9	786.7	480.3	130.7	113.5	125.9	118.0	183.4	210.6	194.8	164.9	2,858.7
Educational services	180.5	405.8	247.8	67.4	58.5	65.0	60.9	94.6	108.6	100.5	85.1	1,474.6
Health care and social assistance	895.6	2,013.6	1,229.5	334.5	290.4	322.3	302.1	469.5	539.0	498.7	422.1	7,317.4
Arts, entertainment, and recreation	148.4	333.7	203.7	55.4	48.1	53.4	50.1	77.8	89.3	82.6	69.9	1,212.5
Accommodation	73.9	166.1	101.4	27.6	24.0	26.6	24.9	38.7	44.5	41.1	34.8	603.5
Food services and drinking places	422.8	950.4	580.3	157.9	137.1	152.1	142.6	221.6	254.4	235.4	199.3	3,453.9
Other services	377.5	848.6	518.1	141.0	122.4	135.8	127.3	197.9	227.2	210.2	177.9	3,083.8
Households	82.1	184.6	112.7	30.7	26.6	29.5	27.7	43.0	49.4	45.7	38.7	670.8
TOTAL	15,564.9	34,993.4	21,366.4	5,812.6	5,047.5	5,601.4	5,250.0	8,159.2	9,367.5	8,666.6	7,336.3	127,165.8

Employment (Person Years) Upper Bound Direct Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	8,944.7	20,109.6	12,278.6	3,340.3	2,900.6	3,218.9	3,017.0	4,688.8	5,383.2	4,980.4	4,215.9	73,078.1
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	8,944.7	20,109.6	12,278.6	3,340.3	2,900.6	3,218.9	3,017.0	4,688.8	5,383.2	4,980.4	4,215.9	73,078.1

Employment (Person Years) Upper Bound Indirect + Induced Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	7.8	17.5	10.7	2.9	2.5	2.8	2.6	4.1	4.7	4.3	3.7	63.7
Mining	4.1	9.1	5.6	1.5	1.3	1.5	1.4	2.1	2.4	2.3	1.9	33.2
Utilities	23.6	53.1	32.4	8.8	7.7	8.5	8.0	12.4	14.2	13.1	11.1	192.9
Construction	49.6	111.6	68.1	18.5	16.1	17.9	16.7	26.0	29.9	27.6	23.4	405.5
Durable goods manufacturing	491.2	1,104.3	674.3	183.4	159.3	176.8	165.7	257.5	295.6	273.5	231.5	4,013.1
Nondurable goods manufacturing	211.8	476.1	290.7	79.1	68.7	76.2	71.4	111.0	127.5	117.9	99.8	1,730.2
Wholesale trade	317.1	713.0	435.4	118.4	102.8	114.1	107.0	166.3	190.9	176.6	149.5	2,591.1
Retail trade	881.5	1,981.9	1,210.1	329.2	285.9	317.2	297.3	462.1	530.5	490.8	415.5	7,202.1
Transportation and warehousing	178.7	401.7	245.3	66.7	57.9	64.3	60.3	93.7	107.5	99.5	84.2	1,459.8
Information	118.6	266.6	162.8	44.3	38.5	42.7	40.0	62.2	71.4	66.0	55.9	968.9
Finance and insurance	431.8	970.7	592.7	161.2	140.0	155.4	145.6	226.3	259.9	240.4	203.5	3,527.7
Real estate and rental and leasing	868.1	1,951.7	1,191.6	324.2	281.5	312.4	292.8	455.1	522.4	483.4	409.2	7,092.3
Professional, scientific, and technical services	428.4	963.1	588.1	160.0	138.9	154.2	144.5	224.6	257.8	238.5	201.9	3,500.0
Management of companies and enterprises	77.4	173.9	106.2	28.9	25.1	27.8	26.1	40.6	46.6	43.1	36.5	632.1
Administrative and waste management services	349.9	786.7	480.3	130.7	113.5	125.9	118.0	183.4	210.6	194.8	164.9	2,858.7
Educational services	180.5	405.8	247.8	67.4	58.5	65.0	60.9	94.6	108.6	100.5	85.1	1,474.6
Health care and social assistance	895.6	2,013.6	1,229.5	334.5	290.4	322.3	302.1	469.5	539.0	498.7	422.1	7,317.4
Arts, entertainment, and recreation	148.4	333.7	203.7	55.4	48.1	53.4	50.1	77.8	89.3	82.6	69.9	1,212.5
Accommodation	73.9	166.1	101.4	27.6	24.0	26.6	24.9	38.7	44.5	41.1	34.8	603.5
Food services and drinking places	422.8	950.4	580.3	157.9	137.1	152.1	142.6	221.6	254.4	235.4	199.3	3,453.9
Other services	377.5	848.6	518.1	141.0	122.4	135.8	127.3	197.9	227.2	210.2	177.9	3,083.8
Households	82.1	184.6	112.7	30.7	26.6	29.5	27.7	43.0	49.4	45.7	38.7	670.8
TOTAL	6,620.3	14,883.8	9,087.8	2,472.3	2,146.9	2,382.5	2,233.0	3,470.4	3,984.3	3,686.2	3,120.4	54,087.7

Earnings (Millions of 2013 Dollars) Upper Bound Total Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.3	0.8	0.5	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	2.8
Mining	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.9
Utilities	2.7	6.1	3.7	1.0	0.9	1.0	0.9	1.4	1.6	1.5	1.3	22.1
Construction	515.3	1,158.4	707.3	192.4	167.1	185.4	173.8	270.1	310.1	286.9	242.9	4,209.6
Durable goods manufacturing	26.0	58.4	35.7	9.7	8.4	9.3	8.8	13.6	15.6	14.5	12.2	212.2
Nondurable goods manufacturing	12.1	27.2	16.6	4.5	3.9	4.3	4.1	6.3	7.3	6.7	5.7	98.7
Wholesale trade	23.5	52.8	32.2	8.8	7.6	8.5	7.9	12.3	14.1	13.1	11.1	191.9
Retail trade	25.0	56.1	34.3	9.3	8.1	9.0	8.4	13.1	15.0	13.9	11.8	203.9
Transportation and warehousing	8.5	19.0	11.6	3.2	2.7	3.0	2.9	4.4	5.1	4.7	4.0	69.2
Information	8.5	19.0	11.6	3.2	2.7	3.0	2.9	4.4	5.1	4.7	4.0	69.2
Finance and insurance	27.9	62.7	38.3	10.4	9.0	10.0	9.4	14.6	16.8	15.5	13.1	227.9
Real estate and rental and leasing	24.1	54.1	33.0	9.0	7.8	8.7	8.1	12.6	14.5	13.4	11.3	196.5
Professional, scientific, and technical services	30.4	68.3	41.7	11.3	9.9	10.9	10.2	15.9	18.3	16.9	14.3	248.2
Management of companies and enterprises	8.5	19.0	11.6	3.2	2.7	3.0	2.9	4.4	5.1	4.7	4.0	69.2
Administrative and waste management services	11.3	25.4	15.5	4.2	3.7	4.1	3.8	5.9	6.8	6.3	5.3	92.3
Educational services	5.9	13.2	8.1	2.2	1.9	2.1	2.0	3.1	3.5	3.3	2.8	48.0
Health care and social assistance	43.6	98.0	59.8	16.3	14.1	15.7	14.7	22.9	26.2	24.3	20.5	356.2
Arts, entertainment, and recreation	3.4	7.6	4.7	1.3	1.1	1.2	1.1	1.8	2.0	1.9	1.6	27.7
Accommodation	2.4	5.3	3.3	0.9	0.8	0.9	0.8	1.2	1.4	1.3	1.1	19.4
Food services and drinking places	8.4	18.8	11.5	3.1	2.7	3.0	2.8	4.4	5.0	4.7	3.9	68.3
Other services	13.3	30.0	18.3	5.0	4.3	4.8	4.5	7.0	8.0	7.4	6.3	108.9
Households	1.0	2.3	1.4	0.4	0.3	0.4	0.3	0.5	0.6	0.6	0.5	8.3
TOTAL	801.9	1,802.9	1,100.8	299.5	260.0	288.6	270.5	420.4	482.6	446.5	378.0	6,551.6

Earnings (Millions of 2013 Dollars) Upper Bound Direct Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	512.2	1,151.5	703.1	191.3	166.1	184.3	172.8	268.5	308.2	285.2	241.4	4,184.4
Durable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nondurable goods manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Information	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental and leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific, and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and waste management services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Educational services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health care and social assistance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food services and drinking places	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Households	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	512.2	1,151.5	703.1	191.3	166.1	184.3	172.8	268.5	308.2	285.2	241.4	4,184.4

Earnings (Millions of 2013 Dollars) Upper Bound Indirect + Induced Impacts by Sector and Fiscal Year

Sector	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	TOTAL
Agriculture, forestry, fishing, and hunting	0.3	0.8	0.5	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	2.8
Mining	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.9
Utilities	2.7	6.1	3.7	1.0	0.9	1.0	0.9	1.4	1.6	1.5	1.3	22.1
Construction	3.1	6.9	4.2	1.2	1.0	1.1	1.0	1.6	1.9	1.7	1.5	25.2
Durable goods manufacturing	26.0	58.4	35.7	9.7	8.4	9.3	8.8	13.6	15.6	14.5	12.2	212.2
Nondurable goods manufacturing	12.1	27.2	16.6	4.5	3.9	4.3	4.1	6.3	7.3	6.7	5.7	98.7
Wholesale trade	23.5	52.8	32.2	8.8	7.6	8.5	7.9	12.3	14.1	13.1	11.1	191.9
Retail trade	25.0	56.1	34.3	9.3	8.1	9.0	8.4	13.1	15.0	13.9	11.8	203.9
Transportation and warehousing	8.5	19.0	11.6	3.2	2.7	3.0	2.9	4.4	5.1	4.7	4.0	69.2
Information	8.5	19.0	11.6	3.2	2.7	3.0	2.9	4.4	5.1	4.7	4.0	69.2
Finance and insurance	27.9	62.7	38.3	10.4	9.0	10.0	9.4	14.6	16.8	15.5	13.1	227.9
Real estate and rental and leasing	24.1	54.1	33.0	9.0	7.8	8.7	8.1	12.6	14.5	13.4	11.3	196.5
Professional, scientific, and technical services	30.4	68.3	41.7	11.3	9.9	10.9	10.2	15.9	18.3	16.9	14.3	248.2
Management of companies and enterprises	8.5	19.0	11.6	3.2	2.7	3.0	2.9	4.4	5.1	4.7	4.0	69.2
Administrative and waste management services	11.3	25.4	15.5	4.2	3.7	4.1	3.8	5.9	6.8	6.3	5.3	92.3
Educational services	5.9	13.2	8.1	2.2	1.9	2.1	2.0	3.1	3.5	3.3	2.8	48.0
Health care and social assistance	43.6	98.0	59.8	16.3	14.1	15.7	14.7	22.9	26.2	24.3	20.5	356.2
Arts, entertainment, and recreation	3.4	7.6	4.7	1.3	1.1	1.2	1.1	1.8	2.0	1.9	1.6	27.7
Accommodation	2.4	5.3	3.3	0.9	0.8	0.9	0.8	1.2	1.4	1.3	1.1	19.4
Food services and drinking places	8.4	18.8	11.5	3.1	2.7	3.0	2.8	4.4	5.0	4.7	3.9	68.3
Other services	13.3	30.0	18.3	5.0	4.3	4.8	4.5	7.0	8.0	7.4	6.3	108.9
Households	1.0	2.3	1.4	0.4	0.3	0.4	0.3	0.5	0.6	0.6	0.5	8.3
TOTAL	289.7	651.4	397.7	108.2	94.0	104.3	97.7	151.9	174.4	161.3	136.6	2,367.2

ENDNOTES

¹ See the MSBA website <http://www.massschoolbuildings.org/>.

² MSBA funds have also been used for the purchase of school equipment.

³ For an excellent explanation of the RIMS II Input-Output Model, see Rebecca Bass and Zoë Ambargis, “Input-Output Models for Impact Analysis: Suggestions for Practitioners Using RIMS II Multipliers,” 50th Southern Regional Science Association Conference, March 23-27, 2011, New Orleans, Louisiana.

⁴ Bureau of Economic Analysis, U.S. Department of Commerce. 2012. RIMS II: An Essential Tool for Regional Developers and Planners. (November 2012). Available at: http://www.bea.gov/regional/pdf/rims/RIMSII_User_Guide.pdf

⁵ Note: This also applies to the household column. For example, the coefficient in the row representing automobile purchases by households would only represent the purchases of automobiles produced in the U.S.

⁶ Four percent is a conservatively high proxy for full employment. National estimates of the NAIRU (non-accelerating inflation rate unemployment) rate are roughly 5 percent. The state’s NAIRU would be substantially lower, given its highly-educated labor force. Furthermore, the NAIRU rate would correspond to a point on a rising supply curve, somewhere in the region between B and E. Full employment in the sense of a vertical supply curve would occur at a substantially lower unemployment rate than the NAIRU.

⁷ This division is accomplished by a simple mathematical manipulation of the Type I and Type II multipliers. The induced impact is given by the difference between the Type II and Type I multipliers. For non-construction industries, the indirect impact is given by the Type I multipliers. For the construction industry, the Type I multiplier consists of both the direct and the indirect impact. Of these two parts, the indirect part is relatively small and can be approximated by the proportion of the induced impact attributed to construction times the non-construction indirect impact. The direct impact multiplier for construction is then estimated as the Type I multiplier for the construction industry minus the indirect part.

⁸ For simplicity, the word “job” will be used instead of “job-years” in the remainder of this section, and “job” should be interpreted as “job-years”, unless explicitly stated otherwise.

⁹ This ratio of gross operating surplus to value-added is not available at the regional level because RIMS II only provides the regional multipliers, not the whole regional I-O model. This ratio is calculated from the U.S. I-O accounts, as a weighted average of the ratio for the construction industry and the entire economy, with the weights reflecting the proportion of total value-added received by the construction industry in this study.