

Economic Impacts of the Affordable Homes Act

Technical Memo on Findings and Methods

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Prepared by the UMass Donahue Institute's Economic and Public Policy Research Group

Project Leader

Rod Motamedi, Assistant Director

Unit Director

Mark Melnik, PhD

Project Staff

Carrie Bernstein, Research Manager

Rye McKenzie, Research Analyst

Kerry Spitzer, Research Manager

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Introduction

The Executive Office of Housing and Livable Communities (EOHLC) commissioned the Economic and Public Policy Research group of the UMass Donahue Institute (UMDI) to estimate the economic impacts of the proposed Affordable Homes Act (AHA). Together EOHLC and UMDI developed assumptions about the amount of new spending authorized, leveraged, enabled, and unlocked by the AHA. That spending was then run through an economic impact model to estimate the direct, indirect, and induced economic impacts of the AHA and its associated activities and programs.

In October 2023, Governor Healey filed the Affordable Homes Act, a comprehensive housing bond bill with more than two dozen policy sections. For the purposes of this analysis, EOHLC and UMDI selected a subset of the bill's most prominent provisions and grouped them into the program categories listed below:

- **Housing Development**, which includes eight distinct line items that fund the production and preservation of affordable housing for low-income households. (\$1.675 billion)
- **Public Housing Capital**, which supports maintenance, upgrades, and decarbonization of state-supported public housing units. (\$1.5 billion)
- **Housing Development Incentive Program (HDIP)**, a program to incentivize market-rate housing in Gateway Cities. While HDIP was reauthorized in the October 2023 tax relief bill, it was initially included in the Affordable Homes Act and has been incorporated into estimates of the bill's impacts. (\$207 million)
- **HousingWorks** line items that enable or subsidize new development: HousingWorks Infrastructure Program grants and the 40R Smart Growth Incentive Program. (\$195 million)
- **Public Housing Demonstration**, which provides subsidies to support the redevelopment of aging public housing developments into higher-density mixed-income developments with no net loss of deeply affordable units. (\$100 million)
- **Commonwealth Builder**, which subsidizes development of affordable housing for first-time homebuyers and socially and economically disadvantaged individuals. (\$100 million)
- **Home Modification Loan Program**, which provides grants to modify the homes of seniors or of individuals or families with disabilities so that they may maintain residency or return home from institutional settings. (\$60 million)
- **Neighborhood Stabilization Fund**, which funds the acquisition, rehabilitation, and sale of distressed properties. (\$50 million)

- **Surplus Land Disposition** is the Healey-Driscoll Administration’s initiative to identify state-owned land that could be made available for housing development. (policy proposal; \$30 million of state support proposed but not incorporated in this analysis)
- **Local Option Real Estate Transfer Fee**, a provision that would grant municipalities the authority to implement a real estate transfer fee on certain high-value transactions. (Policy proposal, no state spending)
- **Accessory Dwelling Units**, a provision that would legalize such units as-of-right on single-family parcels statewide. (Policy proposal, no state spending)

While these line items in the Affordable Homes Act comprise \$3.7 billion of requested bonding authorization, they do not represent the total of all spending associated with the bill’s implementation. For example, bond sources used for affordable housing development are only one component of the financing “stack” that funds such projects. Developers also rely on state and federal low-income housing tax credits as well as commercial and private funding in the form of debt or equity investments. Programs such as Commonwealth Builder, the proposed Public Housing Demonstration Program, the Housing Development Incentive Program, and the 40R Smart Growth Zoning program all provide supporting subsidies to developments that are principally financed by private sources. Meanwhile, the policy sections involving state land, ADUs, and transfer fees do not involve any significant state spending but create opportunities for substantial private investment or locally raised revenue.

Therefore, any effort to estimate the economic impact of the Affordable Homes Act should also account for all the other state, federal, local, and private spending that would be leveraged or unlocked by the bill’s provisions. Over the bill’s five-year timeline, total spending is estimated to comprise \$1.2 billion from state LIHTC, \$207 million of HDIP subsidies, \$2.28 billion of federal LIHTC, \$1.13 billion of local transfer fee revenues, and \$6.6 billion of private capital or commercial loans. Therefore, the total spending associated with the line items listed above is estimated to be nearly \$15.1 billion over five years.

The estimated expenditures for each program were further broken down into four spending categories that are used by IMPLAN: construction, soft costs (architecture, engineering, legal, etc.), maintenance, and finance costs (fees, interest, etc.). The largest share of spending is expected in the construction category (\$9.7 billion), followed by soft costs (\$2.3 billion), finance (\$1 billion), and maintenance (\$511 million.) These categories make up about 89% of the \$15.1 billion total. The remainder is anticipated to be used for land acquisition, repayment of loan principle, or other so-called “asset transfers” that have no direct economic impact in the IMPLAN model.

The following sections describe the results of the impact analysis and conclude with a methodology and caveats, explanation of economic terms, and a description of the IMPLAN model. Details about how the total spending associated with the AHA was calculated and how it was allocated to spending categories are included in the methodology appendix.

Summary State-Level Economic Impacts

Table 1: Summary Economic Impacts, Average Annual Impact over Five Years

Impact	Employment	Labor Income (\$Mil.)	Value Added (\$Mil.)	Intermediate Inputs (\$Mil.)
Direct	18,800	\$1,743	\$2,041	\$648
Indirect	2,500	\$226	\$345	\$232
Induced	8,300	\$633	\$1,073	\$615
Total	29,700	\$2,603	\$3,460	\$1,495

Source: EOHLC, UMDI, IMPLAN Note: Employment rounded to nearest 100 jobs. Totals may not match due to rounding.

In combination with LIHTC and HDIP funding already approved by the legislature, the AHA constitutes about \$5.1 billion in state investments in housing. Along with policy changes in the bill, EOHLC estimates this will unlock more than \$10 billion in local, federal, and private investments in housing, for a total of \$15.1 billion, of which approximately \$13.4 billion will be spent on housing construction, maintenance, and related soft costs (see methods for line-item details). The research team ran this spending through the IMPLAN economic impact model, which estimates the ripple effects of a policy or other economic change.

IMPLAN produces results across two dimensions. The first is the impact type. Here there are three categories: direct, indirect, and induced. Direct impacts are those that can be traced directly to the economic change being measured. In this case, it represents the impacts experienced by the businesses providing construction and related services. Indirect impacts capture vendor and supplier relationships not just for the directly impacted firms, but also the suppliers of the suppliers all the way down the supply chain. Finally, induced impacts represent the economic impacts of employees spending their earnings. As the direct and indirect impacted firms gear up to respond to their new demand, they also hire and pay more workers who spend their paychecks in their communities.

The other dimension of results is the indicator. In this report we mainly present five. The first three, employment, labor income, and revenues, are defined in largely the same way as most people understand them though with some small differences. Employment is a count of jobs not people, such that one person could occupy multiple jobs. Labor income includes both monetary remuneration from work and the value of benefits. Revenues are the same as total sales or production. To produce goods and services to sell, firms must first purchase other goods and services. For example, a construction contractor buys lumber, sheetrock, and accounting services, among other things. Those purchases are called intermediate inputs because they are a step along the way to making the final good or service purchased by the end consumer. The value of those final goods and services is called value added because it represents the net new value that the economy has created after accounting for the value of inputs used up in production.

As noted above, EOHLC estimates that AHA would result in approximately \$13.4 billion of spending toward new housing. This spending will directly create or support an additional 18,800 jobs in firms providing the design, engineering, construction, maintenance, and financing of the new housing units. Those industries then redirect some of their revenues to purchases from their suppliers. These activities create or support 2,500 jobs in industries such as building material supply stores, employment services, architectural and engineering services, truck transportation, and landscaping. Together, direct and indirect employment account for 21,300 jobs earning nearly \$2 billion per year. This spending supports a further 8,300 jobs and \$633 million in income. These induced jobs reflect the composition of the typical consumption basket and include industries like various health care sectors, dining and entertainment, retail, and education.

All told, full implementation of the AHA and associated programs will help create or support roughly 29,700 new jobs. These workers are expected to collectively earn \$2.6 billion per year over the analysis period. In addition to workers, firms will also benefit. The construction and maintenance enabled by the AHA will add nearly \$3.5 billion per year to the Commonwealth’s economy over the analysis period. In addition, firms throughout the Commonwealth’s supply chain are estimated to gain \$1.5 billion of revenues by providing the goods and services needed to complete the new or improved housing.

Table 2: Summary Tax Impacts, Average Annual Impact over Five Years

Impact	Local (\$Mil.)	State (\$Mil.)	Federal (\$Mil.)	Total (\$Mil.)
Direct	\$8	\$81	\$407	\$496
Indirect	\$12	\$17	\$56	\$85
Induced	\$38	\$54	\$162	\$254
Total	\$58	\$152	\$624	\$834

Source: EOHLC, UMDI, IMPLAN Note: Totals may not match due to rounding. Direct impacts to local taxes were reduced by 47% to reflect the deed-restricted share of housing.

As the overall economy grows and households receive new income, governments also benefit through new tax revenues, including local property and meals taxes; state income, sales, and corporate taxes; and federal income and corporate taxes. Because nearly half of the new housing units are expected to be deed restricted and owed by nonprofits, they will be exempt from property taxes, the principal source of local tax revenue. This has the effect of reducing the direct impacts on taxes relative to a purely for-profit buildout. (Taxes are still levied on the personal income as well as the corporate profits of contractors and suppliers.) To account for this, the direct tax revenue associated with the development was discounted by 47 percent. With this adjustment, local governments are estimated to bring in nearly \$58 million of new revenue per year over five years of buildout, or \$290 million in total. Another \$152 million per year is expected to flow to the state for a five-year total of nearly \$760 million. The federal government is estimated to receive \$624 million per year for \$3.1 billion over the analysis period. About three-fifths, or \$6.00 of every \$10.00, of tax revenues are directly related to the building activity with most of the remainder supported by household consumption.

State-Level Impacts by Program

Table 3: Economic Impacts by Program, State, Annual Impact over Five Years

Impact	Employment	Labor Income (\$Mil.)	Value Added (\$Mil.)	Intermediate Inputs (\$Mil.)
Direct	18,800	\$1,743	\$2,041	\$648
Housing Development	8,200	\$764	\$900	\$268
Surplus Land	2,800	\$256	\$302	\$90
Transfer Fee	1,800	\$166	\$196	\$58
Housing Works	1,400	\$129	\$153	\$45
ADU	1,100	\$93	\$103	\$25
HDIP	500	\$43	\$51	\$15
Commonwealth Builder	200	\$21	\$24	\$7
All Else	2,900	\$270	\$313	\$139
Indirect	2,500	\$226	\$345	\$232
Housing Development	1,100	\$96	\$145	\$97
Surplus Land	400	\$32	\$49	\$33
Transfer Fee	200	\$21	\$32	\$21
Housing Works	200	\$16	\$25	\$16
ADU	100	\$8	\$12	\$8
HDIP	100	\$5	\$8	\$5
Commonwealth Builder	0	\$3	\$4	\$3
All Else	500	\$46	\$71	\$48
Induced	8,300	\$633	\$1,073	\$615
Housing Development	3,600	\$276	\$468	\$268
Surplus Land	1,200	\$93	\$157	\$90
Transfer Fee	800	\$60	\$102	\$58
Housing Works	600	\$47	\$79	\$45
ADU	400	\$33	\$55	\$32
HDIP	200	\$16	\$26	\$15
Commonwealth Builder	100	\$7	\$13	\$7
All Else	1,300	\$102	\$173	\$99

Table 3: Economic Impacts by Program, State, Annual Impact over Five Years (continued)

Total	29,700	\$2,603	\$3,460	\$1,495
Housing Development	12,900	\$1,136	\$1,513	\$633
Surplus Land	4,300	\$381	\$508	\$213
Transfer Fee	2,800	\$247	\$330	\$138
Housing Works	2,200	\$193	\$256	\$107
ADU	1,600	\$133	\$170	\$65
HDIP	700	\$64	\$85	\$36
Commonwealth Builder	400	\$31	\$41	\$17
All Else	4,800	\$418	\$556	\$286

Source: EOHLC, UMDI, IMPLAN Note: Employment rounded to nearest 100 jobs. Totals may not match due to rounding.

Table 3 above takes the information that was presented in Table 1 and expands it by program. The programs are ordered by the number of direct jobs. The total spending on housing unlocked and enabled by each program was estimated by EOHLC as was the distribution of that spending between construction, design and engineering, financing costs, and maintenance. Because each program is impacting the same combination of industry sectors, the ranking by total direct jobs is also repeated in the order of income, value added, and intermediate inputs. In essence, the programs' order by impact reflects the amount of spending attributed to each program.

Note that the order of programs, and thus the spending amounts, is generally independent of whether each initiative is new or a furtherance of an existing program or policy. Housing development, HousingWorks, HDIP, and Commonwealth Builder are all existing initiatives with proposed funding expansions while surplus land, transfer fee, and ADUs are new policies. It is also worth noting that the programs differ in the mix of public and private money involved, and within the pool of public money, local, state, and federal sources. That said, generally the new programs rely less on public money than the existing programs.

State-Level Impacts by Industry

Table 4: Top 10 Industries by Change in Employment, State, Annual Impact over Five Years

Rank	Industry	Employment	Revenues (\$Mil.)	Est. Growth Percentage
1	Construction of new multifamily residential structures	16,150	\$1,933	78.3%
2	Architectural, engineering, and related services	2,000	\$479	3.5%
3	Retail - Building material and garden equipment and supplies stores	550	\$85	2.1%
4	Hospitals	550	\$118	0.3%
5	Maintenance and repair construction of residential structures	500	\$110	4.9%
6	Monetary authorities and depository credit intermediation	450	\$286	1.2%
7	Full-service restaurants	450	\$49	0.3%
8	Other real estate	450	\$105	0.2%
9	Individual and family services	400	\$18	0.3%
10	Employment services	350	\$49	0.4%

Source: EOHL, UMDI, IMPLAN Note: Employment rounded to nearest 50 jobs.

Table 4 shows the top ten industries by total employment impact and their corresponding change in revenues and growth percentage. In a small way, this table tells the larger story of the impacts of the AHA. First, there are the industries that play a direct role in producing the new housing units, namely construction, architectural services, maintenance and repair, and monetary authorities (i.e., banks). Though these sectors are the first recipients of money through the Act's programs, they are not the top four industries by impact; they rank first, second, fifth, and sixth, respectively. Also among the top few sectors are building supply stores and hospitals. Rounding out the top 10 are restaurants, other real estate services, individual and family services, and employment services.

What the top 10 industries by employment shows is a mix of industries that feature prominently in each of the three impact types: direct, indirect, and induced. The direct industries were discussed in the preceding paragraph and are those designing, building and maintaining, and financing homes. Building supply stores, other real estate, and employment services are prominent indirect industries. They supply the building materials needed to build and fit out the structures including lumber, wiring, pipes, flooring, and so on; provide appraisal, title, mortgage, and related services; and provide employer-employee matching services.

The remaining industries reflect the induced effects. Hospitals and individual and family services increase not because the IMPLAN model expects there to be an increase in injuries or demand for social services. Rather, these industries grow because they are already a significant part of the consumption

basket of American households. As more people have jobs and receive paychecks and benefits, these already-prominent industries will receive a share of that income and gain from wider health insurance coverage. A similar logic applies to restaurants, where more employed people and generally higher total income will lead to additional spending on dining out.

Finally, the impacts on the construction sector require some context. The stimulus provided by the AHA is large and is anticipated to occur over an accelerated timeline. As such, meeting these demands will require a large and rapid expansion of the construction sector. This pressure will come with downsides, most especially delays and higher costs. On the other hand, a reliable source of multiyear demand will also incentivize business formation, investment, and workforce development. How these two opposing forces will ultimately balance is beyond the scope of the IMPLAN model and this analysis.

While their balance may yet be unknown, advanced knowledge that these challenges and opportunities exist should provide state policymakers, local governments, and businesses time to prepare responses that minimize the price pressures and maximize opportunities. Local governments can ensure that they are prepared for increased demand for permits, inspections, and zoning waivers as well as considering the highest and best use for any surplus state lands that may be in their communities. State agencies and their quasi-public counterparts play many critical roles in preparing the groundwork and supporting the implementation of housing expansion. Examples of supports include the community college and MassHire systems helping to find and train new workers; agencies like MassDevelopment, Massachusetts Housing Finance Agency, and Massachusetts Housing Partnership playing their roles in financing and supporting housing projects, especially through financial support for homebuilders; and the Executive Offices of Housing and Livable Communities, Economic Development, and Labor and Workforce development monitoring the policy environment, providing expert guidance to communities and the legislature, and propagating best practices.

County-Level Total Impacts

Table 5: Economic Impacts by County, Annual Average over Five Years

County	Employment	Value Added (\$Mil.)
Barnstable	700	\$67
Berkshire	650	\$61
Bristol	3,250	\$307
Dukes	50	\$4
Essex	3,650	\$389
Franklin	350	\$30
Hampden	2,550	\$239
Hampshire	750	\$65
Middlesex	5,800	\$763
Nantucket	50	\$4
Norfolk	2,450	\$314
Plymouth	1,700	\$183
Suffolk	3,600	\$619
Worcester	4,150	\$414
Total	29,700	\$3,460

Source: EOHLC, UMDI, IMPLAN Note: Employment rounded to nearest 50 jobs. Totals may not match due to rounding.

Total statewide spending was allocated to the counties based roughly on the number of households (see methods section for details). As a result, the county totals above generally reflect the population distribution of the Commonwealth. The deviation from a simple population share occurs because the distribution also considers the percentage of households in various income brackets which is not uniform from county to county.

The research team also expects that in practice the impacts in Suffolk, Nantucket, and Dukes Counties will be somewhat higher, and the other counties proportionately lower, than is currently estimated. This is due to the impact related to the transfer fee. Because that fee will only be levied on high-value transactions, it will disproportionately occur in the counties with the most expensive housing. Because it is currently unknown which communities will choose to adopt the transfer fee, the research team chose to apportion it like the other programs.

Appendix: Methodology

Development of Spending Amounts and Categories

Spending inputs for the IMPLAN model were developed by EOHLC in consultation with UMDI. These inputs consisted of total estimated expenditures (from all sources) by program category as well as estimated distribution of spending across four areas: construction, maintenance, financing (fees and interest), and “soft costs” (architecture, engineering, legal, etc.) The analysis focused on 16 authorizations within the AHA totaling \$3.68 billion as well as three key policy provisions. EOHLC determined it would be difficult to confidently estimate spending patterns of the remaining policy proposals and authorizations (totaling \$485 million), so these were excluded from the analysis. Therefore, the spending inputs do not include the full complement of spending or policy changes sought by the bill.

As noted previously, the HDIP program was initially planned for inclusion in the Affordable Homes Act but was reauthorized by the legislature, along with the state Low Income Housing Tax Credit, in the tax relief bill adopted in October 2023. Given the strong alignment of these two programs with the elements of the Affordable Homes Act, EOHLC has continued to incorporate HDIP and state LIHTC in the analysis of the bond bill’s impact, a practice which is continued here.

Ultimately, the various programs and line items were grouped into 11 program categories for the development of IMPLAN spending inputs. As noted in the memo’s introduction, the requested authorizations are only a part of the total spending associated with implementation of the bill. Housing development activities leverage federal tax credits and attract private capital; the transfer fee provision enables local revenue creation; and policy changes can unlock the opportunity for private sector investment. The assumptions underlying the total spending estimates for each program category are summarized in the bulleted list below. The spending estimates are consistent with previously developed unit production estimates prepared by EOHLC and assume total development costs of \$450,000 per unit for both market-rate and subsidized units.

- **Housing Development:** Eight line items in the Affordable Homes Act constitute \$1.675 billion of authorizations for affordable housing development and preservation. In practice, these funds will be combined with previously authorized state LIHTC (\$1.2 billion over five years) and anticipated federal LIHTC (\$2.28 billion over five years), for a total of \$5.155 billion. EOHLC data on projects recently completed, underway, or proposed indicate the total development cost for such projects averages \$450,000 per unit. About \$350,000 of the development costs are covered by state or federal subsidies, with the remainder covered by commercial debt or private equity. These figures suggest that the combination of bond bill, state LIHTC, and federal LIHTC could support creation or preservation of nearly 15,000 units, entailing an additional \$1.5 billion of private debt or equity funding. All told, it is expected that housing development activities will result in \$6.638 billion in total spending.

- **Public Housing Capital:** The bill seeks \$1.35 billion for public housing maintenance and modernization and \$150 million for decarbonization of public housing, for a total of \$1.5 billion. These activities are not anticipated to involve a significant amount of local, federal, or private funding.
- **Housing Development Incentive Program (HDIP):** Prior analysis by EOHLC estimated that the new \$207 million HDIP authorization could support creation of approximately 830 market rate units. It is expected that private sector investment in these developments would total at least \$200,000 per unit, for a total of nearly \$373 million of spending.
- **HousingWorks:** The HousingWorks Infrastructure program would provide \$175 million in funding for public construction projects. It is not anticipated that these projects will involve a substantial amount of federal or private funding. Data to estimate the local contribution to these projects were not readily available, so these local funding sources are not accounted for. The 40R Smart Growth Incentive Program provides a small local incentive to municipalities to zone for as-of-right higher density development. Based on past years, EOHLC estimates that this program could stimulate the development of 2,500 housing units over five years. Using a conservative estimate of \$450,000 per unit, this implies total spending of \$1.1 billion dollars, almost all of which is private funding.
- **Public Housing Demonstration:** EOHLC previously estimated that this \$100 million program could stimulate construction of 1,200 units. Using a conservative development cost estimate of \$450,000 per unit, this implies total spending of \$540 million, of which more than 80% would be private funding.
- **Commonwealth Builder:** Prior analysis by EOHLC estimated that a \$100 million authorization could support the creation of approximately 400 middle-income units. It is expected that private sector investment in these developments would total at least \$200,000 per unit, for a total of \$180 million of spending.
- **Home Modification Loan Program:** The Home Modification Loan program would provide \$60 million in funding to individual homeowners. It is not anticipated that these projects will involve a substantial amount of state or federal funding. Information about the amount of spending by homeowners for these improvements was not available, so these contributions are not accounted for in the analysis.
- **Neighborhood Stabilization Fund:** EOHLC estimated that 25 percent of the program funds (\$12.5 million out of \$50 million) would go toward renovation of previously distressed properties. It is not anticipated that these projects will involve a substantial amount of state or federal funding. Information about homeowner contributions to these improvements was not available, so these contributions are not accounted for in the analysis. The remaining 75 percent of the program funds may be directed toward property acquisition (which does not have an economic impact in IMPLAN) or other programs whose economic impacts are difficult to measure.

- Surplus Land Disposition:** EOHLC previously estimated that more proactive reuse of underutilized state land could enable the development of 9,900 units over five years. It was assumed that half of these would be privately financed, and half would utilize subsidy programs already described in the housing development program category. To prevent double counting, the subsidized units are not considered here. Approximately 5,000 privately financed units at a (conservative) average development cost of \$450,000 per unit implies total investment of \$2.23 billion.
- Local Option Real Estate Transfer Fee:** EOHLC previously estimated that if 50 percent of municipalities adopted a one percent levy, the transfer fee could raise an estimated \$1.125 billion over a five-year period. This is 29% of the theoretical maximum fund-raising capacity of a 2% fee adopted in every city and town. Assuming a \$350,000 per-unit subsidy, this could support the creation of 3,200 units involving \$321 million of private finance (\$100,000 per unit.) In total, this would result in \$1.4 billion in total spending.
- Accessory Dwelling Units:** EOHLC previously estimated that even modest ADU adoption rates could produce 8,000 to 10,000 such units over five years. Based on a literature review, EOHLC estimated a per-unit cost of \$100,000 per unit. Adopting the more conservative production estimate of 8,000 units, this implies \$800 million of private finance to produce these units (no local, state, or federal funding will be involved).

A summary of the assumed spending by program category and funding source is presented in the table below.

Table 6: Spending Assumptions by Source and Program Category (\$Mil.)

Program Category	Affordable Homes Act	State LIHTC & HDIP	Local Transfer Fee	Federal LIHTC	Private Finance	Total Spending
Housing Development	\$1,675	\$1,200	N/A	\$2,280	\$1,483	\$6,638
Public Housing	\$1,500	N/A	N/A	N/A	N/A	\$1,500
HDIP	N/A	\$207	N/A	N/A	\$166	\$373
HousingWorks (Infrastructure & 40R)	\$195	N/A	N/A	N/A	\$1,105	\$1,300
Public Housing Demonstration	\$100	N/A	N/A	N/A	\$440	\$540
Commonwealth Builder	\$100	N/A	N/A	N/A	\$80	\$180
Home Modification Loan Program	\$60	N/A	N/A	N/A	N/A	\$60
Neighborhood Stabilization fund	\$13	N/A	N/A	N/A	N/A	\$13

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Program Category	Affordable Homes Act	State LIHTC & HDIP	Local Transfer Fee	Federal LIHTC	Private Finance	Total Spending
Surplus Land Disposition	N/A	N/A	N/A	N/A	\$2,228	\$2,228
Transfer fee	N/A	N/A	\$1,125	N/A	\$321	\$1,446
Accessory Dwelling Units	N/A	N/A	N/A	N/A	\$800	\$800
Total	\$3,643	\$1,407	\$1,125	\$2,280	\$6,645	\$15,077

Source: EOHLC

Once the total estimated spending associated with each program category is determined, it must be allocated into spending categories for modeling. UMDI and EOHLC decided to use the four following categories that best fit the data and available IMPLAN industry sectors: construction, maintenance, financing (fees and interest), and “soft costs” (architecture, engineering, legal, etc.) It should be noted that land acquisition, repayment of loan principle, capitalization of reserve funds, and other so-called “asset transfers” do not directly result in labor activity and have no direct economic impact in the IMPLAN model.

Spending allocation for housing development programs was based on EOHLC’s review of the Housing Development Division grant management system data about 458 active applications totaling 26,538 units of affordable housing production and preservation. This review found that total development cost (TDC) averaged \$450,681 per unit, with 65 percent of the total going to construction activities, 15 percent to soft costs, eight percent to interest and finance fees, and 12 percent to acquisition or capital reserves. This allocation of spending categories was applied to the other program categories focused on housing production or preservation (e.g., Surplus Land, Commonwealth Builder, etc.). Distribution of funds for the other categories was based on consultation with EOHLC program staff and professional judgement. Assumptions about spending within each program category are presented in the table below.

Table 7: Allocation of Total Program Spending to Spending Categories

Program Category	Construction	Soft Costs	Interest and Finance	Maintenance	Other (not in IMPLAN)
Housing Development	65%	15%	8%	0%	12%
Public Housing	48%	25%	0%	28%	0%
HDIP	65%	15%	8%	0%	12%
HousingWorks (Infrastructure and 40R)	66%	13%	7%	0%	14%
Public Housing Demonstration	65%	15%	8%	0%	12%

Program Category	Construction	Soft Costs	Interest and Finance	Maintenance	Other (not in IMPLAN)
Commonwealth Builder	65%	15%	8%	0%	12%
Home Modification Loan Program	50%	25%	0%	25%	0%
Neighborhood Stabilization Fund	50%	25%	0%	25%	0%
Surplus Land Disposition	65%	15%	8%	0%	12%
Transfer fee	65%	15%	8%	0%	12%
Accessory Dwelling Units	80%	0%	0%	10%	10%
Total	64%	15%	7%	3%	11%
Total (\$ million)	\$9,664	\$2,273	\$1,002	\$511	\$1,627

Source: EOHLC

In total, we estimate that 64 percent of combined spending would be directed to construction activities, 15 percent to soft costs, seven percent to interest and finance, and three percent to maintenance. An estimated 11 percent of total spending is expected to go to land acquisition or other asset transfers and thus have no impact on the IMPLAN outputs.

Development of IMPLAN Inputs from Spending Assumptions

EOHLC provided UMDI with the key spending assumptions needed for the economic analysis, as detailed above. UMDI developed the methodology to translate that data into inputs to the IMPLAN economic impact model including allocating the spending to industries and counties. The list below describes the spending categories and their associated IMPLAN industry.

- Construction: Construction of new multifamily residential structures
- Soft Costs: Architectural, engineering, and related services
- Financing Costs: Monetary authorities and depository credit intermediation (i.e., banks)
- Maintenance: Maintenance and repair construction of residential structures

Apportionment of the total spending to the counties was based on data from EOHLC and the U.S. Census Bureau. EOHLC provided UMDI with an estimate of the number of units that would be created through a subset of the programs listed above. Additionally, EOHLC estimated how those units would be distributed by household income, with the programs targeting affordable housing skewing toward lower income brackets while those that would primarily create market-rate housing skewing toward higher incomes. These two pieces of data provided the research team with the number of new housing units by program and income bracket.

Table 8: Distribution of Households Served by Program and Income Bracket

Program	Total HHs	Household Income						
		0-\$15k	\$15k-\$30k	\$30k-\$40k	\$40k-\$50k	\$50k-\$70k	\$70k-\$100k	\$100k or more
Housing Development	14,729	5%	10%	10%	25%	25%	25%	0%
Surplus Land Disposition	2,500	0%	5%	10%	25%	25%	25%	10%
Transfer Fee	3,214	5%	10%	10%	25%	25%	25%	0%
Housing Works 40R	625	0%	5%	10%	25%	30%	30%	0%
HDIP	828	0%	0%	0%	0%	0%	20%	80%
Commonwealth Builder	400	0%	0%	0%	0%	0%	20%	80%

Source: EOHLC

The next step was to allocate the statewide totals by program among the counties, which we did as described below.

- A. Obtained total impacted households by income bracket from EOHLC as described above.
- B. Calculated each county’s share of households in each income bracket. The primary data source was “Household Income by Gross Rent as a Percentage of Household Income in the Past 12 Months.”¹ This dataset provides county-level data. For each county, households are allocated to one of 16 income brackets (from “Less than \$10,000” to “\$100,000 or more” in mostly \$5,000 increments).
- C. Multiplied the statewide number of households by income bracket from A by each county’s share of households in each income bracket from B to yield the number of impacted households by income bracket by county.
- D. Summed the households from C to obtain county totals, which were then used to calculate each county’s share of total impacted households.
- E. Multiplied the share from D by the spending totals by program from EOHLC to obtain spending by program by industry by county, which the research team then ran through the IMPLAN model.

The statewide economic analysis was run in IMPLAN using the 2022 data for the Commonwealth of Massachusetts, which was the latest dataset available at the time of the analysis. All spending was in

¹ U.S. Census Bureau. "Household Income by Gross Rent as a Percentage of Household Income in the Past 12 Months." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B25074, 2022, [https://data.census.gov/table/ACSDT5Y2022.B25074?q=B25074&g=040XX00US25\\$0500000](https://data.census.gov/table/ACSDT5Y2022.B25074?q=B25074&g=040XX00US25$0500000). Accessed on December 19, 2023.

2024 dollars. The county analysis used the same dataset and dollars but for each of the Commonwealth's 14 counties. The county analysis was done using IMPLAN's multi-region input-output (MRIO) function. MRIO allows for "crosstalk" among the counties such that changes in one county connect to and impact another through things such as intrastate trade and commuting.

As a result of using the MRIO functionality for the county simulations and the single-region input-output function for the state simulation, the county-level analysis and state-level analysis did not yield equal results for equal inputs. To avoid confusion, the research team chose the state-level simulation as the representative findings for this analysis because they were smaller. For the county results presented in Table 5, UMDI used the results of the county simulation to create weights which were used to apportion the state-level results. For context, the county-level analysis produced employment impacts approximately nine percent larger and value-added impacts approximately three percent larger than the state-level analysis. The difference in employment is likely largely explained by lower labor productivity in many counties relative to the state average, which has the effect of creating more jobs, though with lower incomes, for the same amount of economic stimulus relative to an identical analysis using the state averages.

Appendix: IMPLAN Model Background

The UMass Donahue Institute used a model produced by IMPLAN, a North-Carolina-based company that has produced economic impact models since 1972. IMPLAN models use the input-output methodology, which is built on the assumption that all economic actors are connected through buy-sell relationships. These connections allow I-O models to describe how an increase in expenditures by a company, household, or government ripples through the economy to connect with other companies, households, and governments.

IMPLAN models use annual data to build national, state, county, ZIP code, and congressional district models. The data is a combination of publicly available data from sources like the Bureau of Economic Analysis, Bureau of Labor Statistics, and the U.S. Census and estimates produced in-house by IMPLAN. These estimates are primarily done to fill gaps in the data and to transform the various data sources into one consistent framework.

IMPLAN models take inputs from the user and produce estimates of total economic impacts for a given set of regions. Results take the form of direct, indirect, and induced impacts. Direct impacts are those that describe the event that is being measured. In this case, the construction and maintenance of housing. Indirect impacts measure the economic changes supported by business-to-business transactions, also known as supply chain effects. Finally, induced impacts are those supported by consumer spending. In short, direct impacts lead to changes through the supply chain, i.e., indirect impacts. More business activity requires more workers who spend their incomes on goods and services, i.e., induced impacts.

Each of the three result forms is available in four different indicators: employment, output, value added, and labor income. Employment is a count of jobs, where full-time, part-time, and self-employed jobs are all counted as one job. Output is equivalent to business revenues or sales and is the total value of production. Value added is equivalent to contributions to GDP and is output less the value of intermediate inputs, i.e., inputs to production. For this memo, we subtracted value added from output to obtain intermediate inputs, which we presented in the results to better illustrate revenues to the supply chain. Finally, labor income is the sum of wages and salaries, benefits, payroll taxes, and payments to the self-employed or sole proprietors.

Models like IMPLAN typically use fixed coefficients, which is one limitation that is particularly salient to this analysis. Another way of describing fixed coefficients is that the economic relationships contained in the model do not change, whether over time or in reaction to events within the simulation. The practical effect of static coefficients on this analysis is that the model does not consider the effects of scarcity. As mentioned in the main body of the report, the expansion of home construction envisioned by EOHLC because of the AHA is large both in absolute terms and relative to the current size of the construction sector. The increase in demand for construction firms, trades labor, and building materials could all result in higher prices and slower development times. Should this come to pass, the results in this analysis would be somewhat smaller and/or extended over more years.