



# THE ECONOMIC VALUE TO TEXAS OF THE TEXAS A&M UNIVERSITY HEALTH SCIENCE CENTER

IN FISCAL YEAR OF ANALYSIS 2019–2020



PUBLISHED FEBRUARY 2021



*The Texas A&M University Health Science Center (Texas A&M HSC) encompasses research, administration, and clinical services for the five Texas A&M colleges with a health sciences focus: Dentistry, Medicine, Nursing, Pharmacy, and Public Health. The Texas A&M HSC creates value in a variety of ways. The Texas A&M HSC improves higher education delivery throughout the state and helps students increase their employability and potential.*

The Texas A&M HSC influences both the lives of students and also the state economy. The Texas A&M HSC serves a range of industries in Texas, supports state businesses, and benefits society as a whole in Texas from an expanded economy and improved quality of life. The benefits created by the Texas A&M HSC even extend as far as the state and local government through increased tax revenues and public sector savings.

This study investigates the economic impacts created by the Texas A&M HSC on the business community and the benefits that the Texas A&M HSC generates in return for the investments made by its key stakeholder groups—students, taxpayers, and society. The following two analyses are presented:

- **Economic impact analysis**
- **Investment analysis**

All results reflect student and financial data for Fiscal Year (FY) 2019-20 (September 1, 2019 to August 31, 2020). The Texas A&M HSC remained open and operational throughout 2020 and addressed the pandemic, by transferring learning, advising,

support operations, and many other activities to hybrid, occupancy limited and/or virtual platforms. Economic activity from research, such as the Texas A&M HSC received significant federal funding related to Operation Warp Speed, which increased the research spending impact in the state and the largest in person instruction effort in the country, returned some student spending to communities where the Texas A&M HSC teaches. However, the pandemic led to the movement of many summer academic programs online and cancellation of many on-campus events from March to August 2020. Each of these substantially impacted areas such as the observed decrease in student spending impact during the fiscal year.

Impacts on the state business community are reported under the economic impact analysis. Results are measured in terms of total income. The returns on investment to students, taxpayers, and society in Texas are reported under the investment analysis. Both analyses are described more fully in the following sections. An electronic version of the executive summary and fact sheet are available at: [economicimpact.tamu.edu](http://economicimpact.tamu.edu).

# ECONOMIC IMPACT ANALYSIS

*The Texas A&M HSC promotes economic growth in Texas through its direct expenditures and resulting expenditures of students, visitors, and state businesses. The Texas A&M HSC serves as an employer and buyer of goods and services for its day-to-day, research, and construction operations. Numerous start-up and spin-off companies have formed as a result of programs and knowledge at the Texas A&M HSC. The Texas A&M HSC's reputation and activities attract students and visitors from outside Texas, whose expenditures benefit state vendors. In addition, the Texas A&M HSC is a primary source of higher education to Texas residents and a supplier of trained workers to state industries, enhancing overall productivity in the state workforce.*



## OPERATIONS SPENDING IMPACT

The Texas A&M HSC is an important employer in Texas. In FY 2019-20, the Texas A&M HSC employed 1,647 full-time and part-time faculty and staff (less research). Of these, 98% lived in Texas. Total payroll at the Texas A&M HSC was \$140.2 million, much of which was spent in the state for groceries, dining out, clothing, and other household expenses. In addition, the Texas A&M HSC is a large-scale buyer of goods and services. In FY 2019-20, the Texas A&M HSC spent \$57.8 million on day-to-day expenses related to facilities, supplies, and professional services (less research).

The Texas A&M HSC's added \$33 million in total income to the state during the analysis year as a result of its day-to-day operations (less research). This figure represents the Texas A&M HSC's payroll, the multiplier effects generated by the in-state spending of the Texas A&M HSC and its employees, and a downward adjustment to account for funding that the Texas A&M HSC received from state and local sources.

## RESEARCH SPENDING IMPACT

Research activities impact the economy by employing people and requiring the purchase of equipment and other supplies and services. Over the last four years, the Texas A&M HSC received 89 invention disclosures, filed 102 new US patent applications, and produced 19 licenses. The Texas A&M HSC also generated license income over the same four-year time period, with \$400.2 thousand in license income in FY 2019-20.

In FY 2019-20, the Texas A&M HSC spent \$44.5 million on payroll to support research activities. Some of this stemmed from grant funding from the Department of

TABLE 1: Texas A&M HSC research developments

|              | Inventions | Patents    | Licenses  |
|--------------|------------|------------|-----------|
| 2016-17      | 30         | 29         | 1         |
| 2017-18      | 16         | 25         | 9         |
| 2018-19      | 18         | 24         | 2         |
| 2019-20      | 25         | 24         | 7         |
| <b>Total</b> | <b>89</b>  | <b>102</b> | <b>19</b> |

Source: The Texas A&M HSC.

Health and Human Services to fund the production of a COVID-19 vaccine. This, along with \$188.5 million in non-payroll research spending, created a net total of \$276 million in total income for the state economy.

## CONSTRUCTION SPENDING IMPACT

The Texas A&M HSC commissioned contractors to build or renovate a number of facilities during the analysis year. The quick infusion of income and jobs that occurred in the state economy as a result of this construction spending is only considered short-term due to the one-time nature of construction projects. Nonetheless, the construction spending had a positive impact on the state economy. In FY 2019-20, the Texas A&M HSC's construction spending generated \$9.2 million in total income.

## START-UP AND SPIN-OFF COMPANY IMPACT

The Texas A&M HSC creates an exceptional environment that fosters innovation and entrepreneurship, evidenced by the number of Texas A&M HSC start-up and spin-off companies created in the state.<sup>1</sup> Start-up companies, created specifically to license and commercialize Texas A&M HSC technology or knowledge, have a strong and clearly defined link to the Texas A&M HSC. Spin-off companies, created and fostered through university programs or faculty and former students, have a clear but weaker link to the Texas A&M HSC. The number of companies reported by the Texas A&M HSC includes faculty whose primary residence is in the Bryan-College Station area and who have joint appointments at the Texas A&M HSC and at Texas A&M HSC System agencies.

In FY 2019-20, Texas A&M HSC start-up and spin-off companies added \$337.1 million in income to the Texas economy. Of this total income, \$24.4 million was due to the start-up companies, with the remainder due to spin-off companies.

<sup>1</sup> The Texas A&M HSC continuously improves data sources for extant spin-off companies created by former students. A large number of these were added for this report that were previously uncounted.

## STUDENT SPENDING IMPACT

Around 12% of credit-bearing students attending the Texas A&M HSC originated from outside the state in FY 2019-20. Some of these students relocated to Texas. These students may not have come to the state if the Texas A&M HSC did not exist. In addition, some in-state students, referred to as retained students, would have left the state if not for the existence of the Texas A&M HSC. While attending the Texas A&M HSC, these relocator and retained students spent money on groceries, rent accommodation, pay for transportation, and so on. A significant portion of these expenditures occurred in the state, generating \$19.6 million in total income in the state economy during the analysis year.

TABLE 2: Impacts created by the Texas A&M HSC and its former students on the state in FY 2019-20

| Total Income                       | Jobs          |
|------------------------------------|---------------|
| OPERATIONS SPENDING IMPACT         |               |
| <b>\$33 MILLION</b>                | <b>124</b>    |
| RESEARCH SPENDING IMPACT           |               |
| <b>\$276 MILLION</b>               | <b>3,300</b>  |
| CONSTRUCTION SPENDING IMPACT       |               |
| <b>\$9.2 MILLION</b>               | <b>133</b>    |
| START-UP & SPIN-OFF COMPANY IMPACT |               |
| <b>\$337.1 MILLION</b>             | <b>5,122</b>  |
| STUDENT SPENDING IMPACT            |               |
| <b>\$19.6 MILLION</b>              | <b>411</b>    |
| VISITOR SPENDING IMPACT            |               |
| <b>\$2.2 MILLION</b>               | <b>51</b>     |
| TOTAL TEXAS A&M HSC IMPACT         |               |
| <b>\$677.1 MILLION</b>             | <b>9,141</b>  |
| FORMER STUDENT IMPACT              |               |
| <b>\$299.6 MILLION</b>             | <b>6,040</b>  |
| GRAND TOTAL IMPACT                 |               |
| <b>\$976.7 MILLION</b>             | <b>15,182</b> |

## VISITOR SPENDING IMPACT

Thousands of visitors from outside the state were attracted to the Texas A&M HSC during the analysis year to attend commencement, sports events, and other activities sponsored by the Texas A&M HSC.<sup>2</sup> These visitors stayed an average of three nights. While in the state, visitors spent money for lodging, food, transportation, and other personal expenses. The off-campus expenditures of the Texas A&M HSC's out-of-state visitors generated a net impact of \$2.2 million in total income for the state economy in FY 2019-20.

## TOTAL IMPACT OF THE TEXAS A&M HSC ON THE TEXAS ECONOMY

The total economic impact of all statewide components of the Texas A&M HSC on the Texas economy amounted to \$677.1 million in added income. This stems from the Texas A&M HSC's spending on operations, research, and construction, its entrepreneurial activities, and the spending of its students and visitors. This \$677.1 million in total income is equivalent to supporting 9,141 jobs.

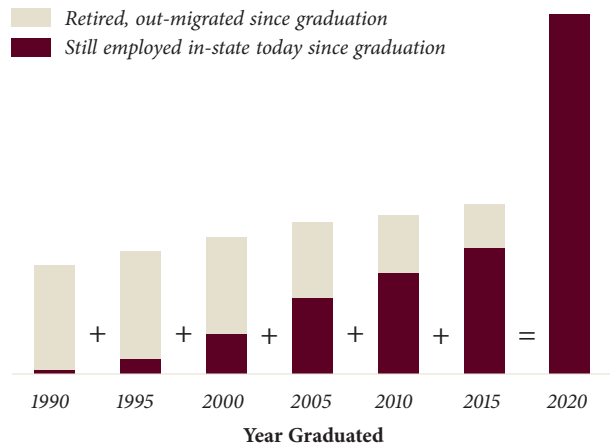
## FORMER STUDENT IMPACT

Since the Texas A&M HSC was established, students have studied at the Texas A&M HSC and entered the state workforce with new skills. Today, thousands of former Texas A&M HSC students are employed in Texas (Figure 1).

During the analysis year, past and present students of the Texas A&M HSC generated \$299.6 million in total income for the state. This figure represents the higher wages that students earned during the year, the increased output of the businesses that employed the students, and the multiplier effects that occurred as students and their employers spent money at other businesses.

<sup>2</sup> Note that many events were cancelled due to COVID-19, decreasing the visitor spending impact.

**FIGURE 1:** Texas A&M HSC former students working in-state today



## GRAND TOTAL IMPACT ON THE TEXAS ECONOMY

The overall impact of the Texas A&M HSC on the state business community during the analysis year amounted to \$976.7 million in total income, equal to the sum of Texas A&M HSC impact (includes the operations spending impact, the research spending impact, the construction spending impact, the impact from start-up and spin-off companies, the student spending impact, and the visitor spending impact) and the former student impact.

The total impact is also expressed in terms of the jobs supported by the total income; they are calculated by jobs-to-sales ratios specific to each industry. Overall, the \$976.7 million impact supports 15,182 jobs.

**TABLE 3:** Top industries in Texas impacted by the Texas A&M HSC

| Industry                                      | Total income (millions) | Jobs          |
|---|-------------------------|---------------|
| Retail Trade                                  | <b>\$315.3</b>          | <b>5,080</b>  |
| Health Care & Social Assistance               | <b>\$191.5</b>          | <b>4,116</b>  |
| Government, Non-Education                     | <b>\$187.6</b>          | <b>2,373</b>  |
| Other Services (except Public Administration) | <b>\$4.2</b>            | <b>495</b>    |
| Professional & Technical Services             | <b>\$28.7</b>           | <b>292</b>    |
| Administrative & Waste Services               | <b>\$13.1</b>           | <b>213</b>    |
| All other industries                          | <b>\$249.5</b>          | <b>2,825</b>  |
| <b>Total impact</b>                           | <b>\$976.7</b>          | <b>15,182</b> |

*\*Numbers may not add due to rounding.*

A portion of the total \$976.7 million is broken out into an industry-by-industry impact ordered by total income. Table 3 outlines the top industries impacted by the Texas A&M HSC. Because industries have different jobs-to-sales ratios, the associated jobs supported by the Texas A&M HSC impact differ by industry. Nonetheless, these are impacts that would not have been generated without the Texas A&M HSC's presence.



# INVESTMENT ANALYSIS

*Investment analysis is the process of evaluating total costs and measuring these against total benefits to determine whether or not a proposed venture will be profitable. If benefits outweigh costs, then the investment is worthwhile and considered profitable.*

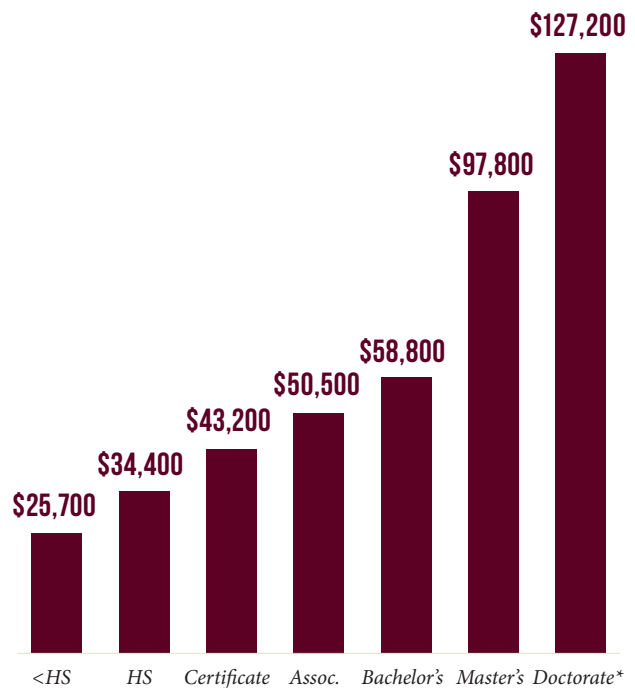
*The Texas A&M HSC received a total of \$651.6 million in FY 2019-20. Tuition and fees comprised 6% of total revenue, student aid from government sources comprised another 55%, and all other revenue comprised the remaining 39%. This study considers the Texas A&M HSC as an investment from the perspectives of those who provided these revenues—students, taxpayers, and society. The backdrop for the analysis is the entire Texas economy.*

## STUDENT PERSPECTIVE

In FY 2019-20, the Texas A&M HSC served 3,190 credit-bearing and 4,299 non-credit students.<sup>3</sup> In order to attend the Texas A&M HSC, the students paid for tuition, fees, books, and supplies. They also took out loans and will incur interest on those loans. Additionally, students gave up money they would have otherwise earned had they been working instead of attending the Texas A&M HSC. The total investment made by the Texas A&M HSC's students in FY 2019-20 amounted to a present value of \$137.9 million, equal to \$44.8 million in out-of-pocket expenses (including future principal and interest paid on student loans) and \$93.2 million in forgone time and money.

In return for their investment, the Texas A&M HSC's students will receive a stream of higher future wages that will continue to grow throughout their working lives. As shown in Figure 2, earnings levels increase as people achieve higher levels of education. For example, the average bachelor's degree completer from the

FIGURE 2: Texas earnings at career midpoint by education level for FY 2019-20 Texas A&M HSC students



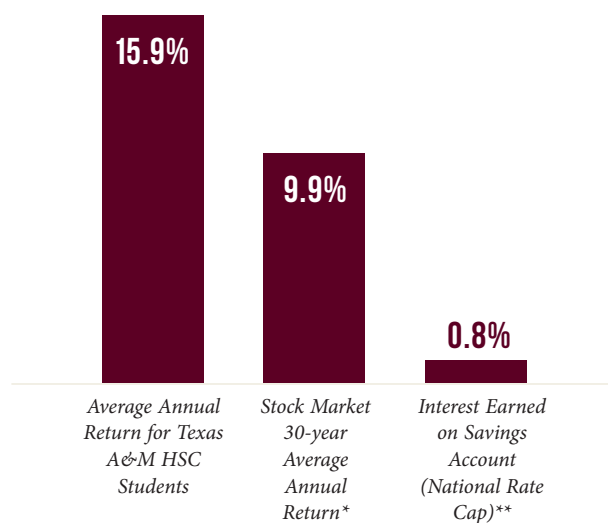
\* Includes professional degrees such as MD, DDS, and PharmD.

<sup>3</sup> Note that a number of programs were discontinued because of COVID-19, affecting the number of non-credit students served.

Texas A&M HSC will see an increase in earnings of \$24,400 each year compared to someone with a high school diploma or equivalent working in Texas. Over a working lifetime, the increase in earnings amounts to an undiscounted value of \$1 million in higher earnings per graduate.

The present value of the cumulative higher future wages that the Texas A&M HSC's FY 2019-20 students will receive over their working careers is \$504.2 million. The students' benefit-cost ratio is 3.7. In other words, for every dollar students invest in the Texas A&M HSC, in the form of out-of-pocket expenses and forgone time and money, they will receive a cumulative value of \$3.66 in higher future wages. The average annual internal rate of return of 15.9%. This is an impressive return, especially when compared to the 30-year average 9.9% return to the U.S. stock market (Figure 3).

FIGURE 3: Student rate of return



\*Forbes' S&P 500, 1989-2018.

\*\*FDIC.gov, 6-2019.

## TAXPAYER PERSPECTIVE

Benefits to taxpayers consist primarily of taxes that the state and local government will collect from the added revenue created in the state. As Texas A&M HSC students will earn more, they will spend more resulting

in higher tax revenues. Employers will also make higher tax payments as they increase their output and purchase more supplies and services. By the end of the FY 2019-20 students' working careers, the state and local government will have collected a present value of \$86.9 million in added taxes.

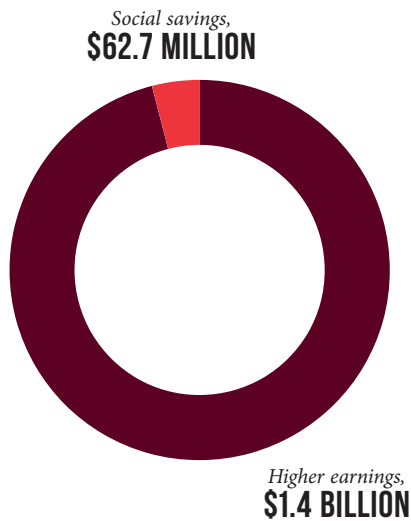
Benefits to taxpayers will also consist of the savings generated by the improved lifestyles of students and the corresponding reduced government expenditures. Education is statistically correlated with a variety of lifestyle changes that generate taxpayer savings across three main categories: 1) health, 2) crime, and 3) income assistance. Improved health habits lower students' demand for national health care services. Students are also less likely to interact with the criminal justice system, resulting in a reduced demand for law enforcement and victim costs. Students are also more employable, so the demand for welfare and unemployment benefits, such as earnings assistance and welfare benefits, is reduced. For a list of study references to these statistical benefits, please contact Texas A&M Public Partnership and Outreach for a copy of the full technical report. All of these benefits will generate \$15.9 million in savings to state and local taxpayers.

Total taxpayer benefits amount to \$102.8 million, equal to the sum of the added taxes and public sector savings. Comparing this to the taxpayer costs of \$174.1 million, equal to the funding that the Texas A&M HSC received from the state and local government during the analysis year—yields a benefit-cost ratio of 0.6. This means that for every \$1 of public money invested in the Texas A&M HSC, taxpayers will receive a cumulative value of \$0.60 over the course of the students' working lives.

## SOCIAL PERSPECTIVE

Society as a whole within Texas benefits from the presence of the Texas A&M HSC in two major ways. The first and largest benefit that society receives is an increased state economic base. As discussed in the previous section, the higher student earnings and increased business output occurs across the state. This raises prosperity in Texas and expands the economic base for society as a whole.

FIGURE 4: Present value of higher earnings and social savings in Texas



Benefits to society also consist of the savings generated by the improved lifestyles of students. Similar to the taxpayer section above, education is statistically correlated with a variety of lifestyle changes that generate social savings. Note that these costs are avoided by the consumers and are distinct from the costs avoided by taxpayers outlined above. Health savings include avoided medical costs associated with smoking, alcohol dependence, obesity, drug abuse, and depression. Savings related to crime include reduced security expenditures and insurance administration, lower victim costs, and reduced expenditures by the criminal justice system. Income assistance savings include reduced welfare and unemployment claims. For a list of study references, to these statistical benefits, please contact Texas A&M Public Partnership and Outreach for a copy of the full technical report.

Figure 4 shows the present value of the higher earnings and social savings that will occur in Texas over the working lifetime of the FY 2019-20 student population at the Texas A&M HSC. Higher wages amount to a present value of \$1.4 billion due to the increased lifetime wages of students and associated increases in business output. Social savings amount to \$62.7 million, the sum of health, crime, and unemployment savings in Texas. Altogether, total benefits to society equal \$1.4 billion (in present value terms).

TABLE 4: Summary of investment analysis results

| STUDENT PERSPECTIVE    |                          |
|------------------------|--------------------------|
| <b>\$504.2 MILLION</b> | Present value benefits   |
| <b>\$137.9 MILLION</b> | Present value costs      |
| <b>\$366.3 MILLION</b> | <b>Net present value</b> |
| <b>3.7</b>             | Benefit-cost ratio       |
| <b>15.9%</b>           | Rate of return           |

| TAXPAYER PERSPECTIVE   |                          |
|------------------------|--------------------------|
| <b>\$102.8 MILLION</b> | Present value benefits   |
| <b>\$174.1 MILLION</b> | Present value costs      |
| <b>-\$71.3 MILLION</b> | <b>Net present value</b> |
| <b>0.6</b>             | Benefit-cost ratio       |

| SOCIAL PERSPECTIVE     |                          |
|------------------------|--------------------------|
| <b>\$1.4 BILLION</b>   | Present value benefits   |
| <b>\$541.6 MILLION</b> | Present value costs      |
| <b>\$895.6 MILLION</b> | <b>Net present value</b> |
| <b>2.7</b>             | Benefit-cost ratio       |
| <b>NA</b>              | Rate of return*          |

\* The rate of return is not reported for the social perspective because the beneficiaries of the investment are not necessarily the same as the original investors.

Society invested a present value of \$541.6 million in educations obtained at the Texas A&M HSC during the analysis year. This includes all expenditures by the Texas A&M HSC, all student expenditures, and all student opportunity costs. For every dollar of this investment, society as a whole in Texas will receive a cumulative value of \$2.65 in benefits, equal to the \$1.4 billion in benefits divided by the \$541.6 million in costs. These benefits will occur for as long as the Texas A&M HSC's FY 2019-20 students remain employed in the state workforce.

## SUMMARY OF INVESTMENT ANALYSIS RESULTS

Table 4 presents the results of the investment analysis for all three of the Texas A&M HSC's major stakeholder groups—students, taxpayers, and society. As shown, students receive great return for their educational investment. At the same time, the investment made by state and local taxpayers to the Texas A&M HSC creates a wide range of benefits to society and returns more to government budgets than it costs.





# CONCLUSION

*The results of this study demonstrate that the Texas A&M HSC creates value from multiple perspectives. The Texas A&M HSC benefits state businesses by increasing consumer spending in the state and supplying a steady flow of qualified, trained workers into the workforce. The Texas A&M HSC enriches the lives of students by raising their lifetime earnings and helping them achieve their individual potential. The Texas A&M HSC benefits state and local taxpayers through increased tax receipts across the state and a reduced demand for government-supported social services. Finally, the Texas A&M HSC benefits society as a whole in Texas by creating a more prosperous economy and generating a variety of savings through the improved lifestyles of students.*

## ABOUT THE STUDY

Data and assumptions used in the study are based on several sources, including the FY 2019-20 academic and financial reports from the Texas A&M HSC, industry and employment data from the U.S. Bureau of Labor Statistics and U.S. Census Bureau, outputs of Emsi's Multi-Regional Social Accounting Matrix model, and a variety of studies and surveys relating education to social behavior. Emsi's methodology for this study adheres to the Association of American Universities (AAU) and the Association of Public and Land-grant Universities (APLU) guidelines, published in December 2014. The study applies a conservative methodology and follows standard practice using only the most recognized indicators of economic impact and investment effectiveness. For a full description of the data and approach used in the study, please

contact Texas A&M Public Partnership and Outreach (Dr. Suzanne Droleskey) for a copy of the full technical report.

## ABOUT EMSI

Emsi is a labor market analytics firm that integrates data from a wide variety of sources to serve professionals in higher education, economic development, workforce development, talent acquisition, and site selection. Emsi is a leading provider of economic impact studies and labor market data to educational institutions in the U.S. and internationally. Since 2000, Emsi has completed over 2,200 economic impact studies for institutions across three countries. For more information about Emsi's products and services, visit [www.economicmodeling.com](http://www.economicmodeling.com).