

The Economic Impact of the University of Minnesota Duluth on Minnesota's Arrowhead Region and Douglas County, Wisconsin

January 26, 2022



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Executive Summary

The University of Minnesota Duluth provides a significant positive impact on the region's economy through its annual operations, construction, and student and visitor spending. In 2019 and 2020, the total impact of all UMD expenditures and those related to its students and visitors was estimated to have supported more than 4,100 jobs and contributed to more than \$581 million in local production.

During the study period, the university budgeted approximately \$260 million in operational expenses, which included \$188 million in compensation and benefits for nearly 1,800 employees. In addition, the institution spent more than \$8 million annually on construction projects. The spending from the university's operational expenditures resulted in nearly 3,000 jobs and almost \$436 million of additional output, while the construction spending led to a total of 82 jobs and over \$11 million of additional output throughout the region.

Student and visitor spending provides a significant impact to the local economy as well. It is estimated that, in 2019 and 2020, students attending UMD spent an estimated \$88 million, while visitors coming from out of the study region to see those students spent another approximately \$10 million. Combined, this spending produced more than 1,100 jobs and increased output for the region by nearly \$135 million.

In FY2019 and FY2020, UMD received, on average, \$50.6 million in state funding while providing more than \$581 million in total output. In other words, for every dollar of state support, UMD provided roughly \$11.50 in total economic impact to the Arrowhead Region in 2019 and 2020.

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In 2010, a summary report was provided by the Bureau of Business and Economic Research (BBER) for the University of Minnesota-Duluth (UMD), estimating the impact of the university’s fiscal year 2009 operations and student spending on the economy of Minnesota’s Arrowhead Region and Douglas County in Wisconsin. That study was updated in 2015. This latest report provides an updated assessment using fiscal years 2019 and 2020 to better capture the current impact of UMD, estimating the economic impacts of the University’s operations, construction, student spending, and visitor spending.¹

Inputs to the Model

Table 1 below summarizes UMD’s employment and operational expenditures for the fiscal years of 2019 and 2020. Due to the dramatic effects of COVID-19 on the university’s budget and spending, the research team used the average of fiscal years 2019 and 2020 to show the impacts of the university in a more typical year. The dollar amounts used for the model were inputs in 2020 dollars, but for this report, all figures stated as outputs from the analysis were adjusted for inflation to reflect 2021 dollar amounts.

In total, institutional spending equaled roughly \$260 million during the two-year period,² \$189 million of which was allocated to employee compensation and benefits for the university’s 1,795 full- and part-time staff and faculty.

Table 1. UMD Operations and Construction Expenditures 2019-2020

<i>Fiscal Year</i>	<i>Employment</i>	<i>Wages and Benefits (Millions)</i>	<i>Total Operating Expenses (Millions)</i>	<i>Capital and Construction Spending</i>
2019	1,795	\$186.3	\$258.9	\$5.2
2020	1,795	\$190.8	\$262.0	\$11.6
Average	1,795	\$188.6	\$260.4	\$8.4

SOURCE: UMD FACTS WEBSITE; OFFICE OF BUDGET AND ANALYSIS, FACILITIES MANAGEMENT

An additional budget of \$5.2 million was designated for capital expenditures (i.e. construction projects) in 2019 and \$11.6 million in 2020, for an average spending of \$8.4.³

The university also provides a significant economic impact to the study region from spending on the part of its current students and their visitors. Enrollment estimates used in calculating student and visitor spending were provided by the University’s Office of Institutional Research and are shown in Table 2 on the next page.

¹ This report sought to replicate the same methodology used in the 2015 study whenever possible to maintain a high level of compatibility between the reports. However, due to variations in the type of data available to the research team, a true replication of the original report was not possible. Therefore, the findings from this update should not be viewed in a direct comparison to the findings of prior reports but rather as a similar but independent account of the school’s current impacts.

² UMD’s Office of Budget and Analysis

³ UMD’s Facilities Management department

On average, 9,560 degree-seeking students were enrolled at UMD between fall 2019 and 2020.⁴ Of those, roughly 2,500 lived on campus. Economic impacts are the result of spending by students who would not otherwise live in Duluth if not for the University and by visitors who travel to Duluth to see those students. Therefore, the research team estimated the number of students living with parents, using the average value (6.9%) from a series of studies conducted by Wilder Research on the economic impacts of the Minnesota State four-year universities.⁵ These students (n=655) were excluded from the student and visitor spending portion of the analysis. In total, roughly 8,900 students were included in this portion.

Table 2. Number of Degree-Seeking Students by Living Situation (2019-2020)

<i>Type of Student</i>	<i>Fall 2019</i>	<i>Fall 2020</i>	<i>Average*</i>
All degree-seeking students	9,823	9,295	9,560
Living on campus	2,966	2,035	2,501
Living off campus	6,857	7,260	7,059
Not with parents	6,184	6,624	6,404
With parents (not included in analysis)	673	636	655
Students Included in Analysis	9,150	8,660	8,904

*Totals may not sum due to rounding

SOURCE: UMD OFFICE OF INSTITUTIONAL RESEARCH, WILDER RESEARCH

Student spending estimates were provided by UMD's One Stop Student Services website and were calculated by the financial aid office.⁶ The estimates include student spending on room and board, transportation, and personal/miscellaneous spending.⁷ In total, students living on campus spent just over \$2,500 annually. By comparison, students living off-campus spent nearly \$13,000 each year, due to their additional spending on room and board expenses.

Table 3. Estimated Annual Student Spending

<i>Type of Student</i>	<i>Number Enrolled</i>	<i>Room & Board⁸</i>	<i>Transportation</i>	<i>Personal Expenses</i>	<i>Annual Expenses</i>	<i>Total</i>
On-Campus	2,501	0	\$240	\$ 2,296	\$2,536	\$6,340,308
Off-Campus	6,404	\$10,225	\$240	\$ 2,296	\$12,761	\$81,721,444
Total	8,904					\$88,061,752

SOURCE: ONE STOP STUDENT SERVICES

⁴ In fall 2019 and 2020 the university enrolled roughly 1,000 non-degree seeking students, most of whom were participating in the post-secondary enrollment options (PSEO) or college in the schools (CITS) programs. These students were not included in the analysis.

⁵ <https://www.wilder.org/wilder-research/research-library/minnesota-state-colleges-and-universities-local-economic-impact>

⁶ <https://onestop.d.umn.edu/finances/cost-attendance>

⁷ Student expenses paid to the university (e.g. room and board for students living on campus, books, student loans, and tuition) were excluded from the analysis, as they are modeled as part of the university's operating expenses.

⁸ UMD's One Stop's cost of living estimates are for nine months of residence. However, since rental properties do not typically have nine-month leases, the BBER inflated those values by 133% to represent 12 months of rent. It was assumed that students are required to pay rent for the summer months to fulfill the typical full-year lease, regardless of whether or not they are living at their Duluth residence. Food expenses were not inflated.

Visitor spending refers to spending on the part of family and friends who travel to Duluth to see UMD students. Visitor spending estimates and the number of visitors per year are shown in Table 4 below. The average spending per visit (\$146.87) was estimated using data from seven studies related to tourism spending in St. Louis County, Grand Rapids, and Duluth,⁹ inflated to 2020 dollars. The estimated number of visitors per year (7.7) came from a study by Wilder Research for the Minnesota State Colleges and Universities system in 2006. In total, estimated results show that visitors coming to see UMD students living in Duluth spend more than \$10 million annually on lodging, restaurants, gasoline, shopping, and other similar items.

Table 4. Estimated Annual Visitor Spending (2020)

<i>Category</i>	<i>Spending by Category</i>
Lodging	\$61.28
Restaurants	\$34.59
Gasoline/fuel	\$20.27
Shopping	\$11.21
Entertainment	\$6.68
Miscellaneous spending	\$5.41
Other transportation costs	\$3.85
Grocery or convenience	\$3.59
Spending per visitor	\$146.87
Visitors per student per year	7.7
Number of students	8,904
Total spending	\$10,069,525

SOURCE: BBER AND WILDER RESEARCH

Key Findings

The direct economic benefits described in the previous section were used to model the economic impacts¹⁰—direct, indirect, and induced—of the University of Minnesota Duluth on other supporting local industries.

Economic impact analysis tracks an initial economic shock or activity (like the direct spending of the university and its students and visitors) through multiple rounds of industry and consumer spending to show the multiplier or ripple effects through a local economy. The initial shock or activity is considered the direct effect, the resulting increase in industry spending is the indirect effect, and the resulting increase in consumer spending is the induced effect. This section summarizes the economic impacts for each aspect of the analysis (operations, construction, and student and visitor spending) Results are measured in employment, output, labor income, and value added.

Economic impact analysis requires the analyst to select a study area—the boundary of the local economy. Though most of the direct effects of the university will likely be felt in the city of Duluth, the indirect and induced effects that arise from increased business spending and household spending are often distributed

⁹ Studies used in determining visitor spending can be found in Appendix A, References.

¹⁰ For more details on the assumptions and methodology used in input-output modeling, see Appendix B.

more broadly and are based on the location of local suppliers, the labor market, and other factors.

The study area consisted of the seven counties of the Arrowhead Region of northeastern Minnesota (Aitkin, Carlton, Cook, Itasca, Koochiching, Lake, and St. Louis) and Douglas County in northwestern Wisconsin.

The research team used the IMPLAN Group’s input-output modeling data and software (IMPLAN version 3.1) for modeling economic impacts. The data used was the most recent IMPLAN data available, which is for the year 2020. All data were modeled in the year 2020. All results are shown in thousands of dollars for the year 2021.

Operations and Construction

Table 5 shows the total economic effects resulting from the university’s operational expenditures. The column labeled employment shows the number of jobs that the university supports both directly and through indirect and induced effects. As shown in the table, in addition to the 1,795 staff and faculty that the university directly employs, another 1,175 jobs are created throughout the study area through indirect and induced spending on the part of the university.

Table 5. Economic Impact of UMD Operations (Millions of Dollars)

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	1,795	\$188.6	\$188.6	\$260.4
Indirect Effect	177	\$8.7	\$13.4	\$28.8
Induced Effect	998	\$43.5	\$80.6	\$146.6
Total Effect	2,971	\$240.8	\$282.6	\$435.8
Multiplier	1.65	1.28	1.50	1.67

SOURCE: BBER

Labor Income, the second column, is the compensation of all employees involved, including wages, benefits, and proprietor income. In addition to the income of university employees, estimated at almost \$189 million, an additional \$52 million in combined indirect and induced regional income resulted from UMD’s operations.

The third column, Value Added, represents the estimated contribution to gross regional product (GRP) made by an individual producer, industry, or sector. This impact includes additional employee compensation, taxes on production and imports, and gross operating surplus across the local economy due to university spending. The value added impact of the university’s operations was nearly \$283 million in the region.

The far right column in Table 3 shows Output, the total value of all local industry production related to UMD’s operational spending. From the data collected, because of the multiplying effect of direct spending and employment, the university is estimated to have contributed nearly \$436 million in total regional output.

The last row in the table shows the multipliers associated with each effect. A multiplier indicates how much additional spending is added to the study area’s economy for each dollar in new spending. For example, for every job created by UMD, another 0.65 jobs are added in other supporting industries. Likewise, for every dollar in wages, benefits, and payroll taxes that was paid to university employees, another \$0.28 was paid to employees in other industries through indirect and induced spending effects. And for every dollar the university spent in the study area (output) another \$0.67 was spent in supporting industries.

Table 6 shows the economic impacts from the university’s construction spending. For the purpose of this

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analysis, the research team modeled the average spending on construction for fiscal years 2019 and 2020.¹¹ According to the results, the \$8 million in construction expenditures spent on average each year in 2019 and 2020 resulted in the creation of 57 direct jobs and 25 additional jobs throughout the study area. As a result of the university's construction projects, output in the study region increased by just over \$11 million.

Table 6. Economic Impact of UMD-Sponsored Construction in 2020 (Millions of Dollars)

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	57	\$3.5	\$4.3	\$7.0
Indirect Effect	6	\$0.3	\$0.6	\$1.2
Induced Effect	19	\$0.8	\$1.6	\$2.8
Total Effect	82	\$4.7	\$6.5	\$11.1
Multiplier	1.44	1.33	1.49	1.57

SOURCE: BBER

Student and Visitor Spending

The economic impact of UMD students' and visitors' spending is summarized in Table 7. Each year, UMD students spend nearly \$90 million on expenses related to rent, food, transportation, and personal items (see Table 3, page 3).¹² In addition, each enrolled student brings, on average, 7.7 visitors to Duluth each year, who in total spend roughly \$10 million on lodging, restaurants, gasoline, and retail (see Table 4, page 4). In total, this spending created or supported more than 1,100 jobs in the study area, added nearly \$30 million in additional wages and benefits, and more than \$56 million in value added spending throughout the study area.

Table 7. Economic Impact of UMD Student and Visitor Spending (Millions of Dollars)

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	756	\$15.1	\$30.7	\$79.0
Indirect Effect	229	\$9.1	\$15.9	\$37.9
Induced Effect	123	\$5.4	\$9.9	\$18.0
Total Effect	1,109	\$29.6	\$56.5	\$134.9
Multiplier	1.47	\$1.96	\$1.84	\$1.71

SOURCE: BBER

¹¹ In economic impact modeling, construction impacts are considered temporary, ending once the construction project is complete.

¹² Due to margining, the direct effects shown in Table 7 is somewhat lower than the direct economic benefits estimated in Tables 3 and 4. In the IMPLAN model, retail industries have margins on their goods, and only a portion of each sale is introduced into the local economy. A retail sales margin is calculated as sales receipts less the cost of the goods sold. It consists of the trade margin plus sales taxes and excise taxes that are collected by the trade establishment.

Total Economic Impact

The overall total regional effects of the University of Minnesota Duluth can be estimated by combining each of the previously discussed impact summaries. This includes the impacts of the university's operational and capital expenditures and those of the students and their friends and families.

Table 8. Combined Economic Impact of the University of Minnesota Duluth (Millions of Dollars)

<i>Total Effects</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Operations	2,971	\$240.8	\$282.6	\$435.8
Student and Visitor Spending	1,109	\$29.6	\$56.5	\$134.9
Construction	82	\$4.7	\$6.5	\$11.1
Combined Effects	4,161	\$275.1	\$345.5	\$581.7

SOURCE: BBER

On average, the model estimated that almost 4,200 jobs were supported as a result of the university's ongoing operation in the region each year (about 3,000 direct jobs and 1,200 indirect or induced). Furthermore, the university contributed nearly \$582 million in total output throughout the study region each year.

Conclusion

The University of Minnesota Duluth has a significant impact throughout Northeast Minnesota and Douglas County, Wisconsin, both in terms of the employment it provides for nearly 2,000 employees and the economic benefit it produces through its ongoing operations. In 2019 and 2020, the university had budgeted average expenses of more than \$260 million for operations and \$8 million for construction and capital expenses. These expenditures were used as inputs for the impact models constructed for this report. Results show 2,971 jobs and almost \$423 million of additional output from operations and 91 jobs and over \$12 million of additional output from construction as outcomes of the university's impact on the region.

Students attending UMD in 2020 spent an estimated \$88 million, while visitors coming from out of the study region to see those students spent another approximately \$10 million. Combined, this spending produced more than 1,100 total jobs and increase output for the region by nearly \$135 million. In total, the impact of all UMD expenditures and those related to its students and their friends and families was estimated to have supported almost 4,200 jobs with a total effect on regional output of almost \$582 million each year.

In FY2019 and FY2020, UMD received, on average, \$50.6 million in state funding¹³ while providing more than \$581 million in total output. In other words, for every dollar of state support, UMD provided roughly \$11.50 in total economic impact to the Arrowhead Region in 2019 and 2020.

¹³ The amount shown (\$50.6 million) reflects the average state funding allocation for fiscal years 2019 (\$48.9 million) and 2020 (\$52.3 million) and includes state funding for operations and maintenance (O&M) as well as state special funds: restricted-purpose appropriations for agriculture, health sciences, technology, and others.

Appendix A. References

- Erkkila, Daniel L. and Xinyi Qian, "Assessing the Annual Economic Impact of the Grand Rapids IRA Civic Center." (2015) <https://conservancy.umn.edu/handle/11299/169869>
- Haynes, Monica, Gina Chiodi Gensing, et al, "The Economic Impact of the Duluth Amateur Hockey Association on the City of Duluth." (2015) <https://conservancy.umn.edu/handle/11299/203321>
- Haynes, Monica, Gina Chiodi Gensing, et al, "The Economic Impact of the Lake Superior and Mississippi Railroad." (2018) <https://conservancy.umn.edu/handle/11299/203561>
- Rockport Analytics, "The 2016 Economic Impact of Glensheen Historic Mansion in Duluth, MN." (2017) <https://glensheen.org/wp-content/uploads/2018/04/Economic-Impact-Assessment-of-Glensheen-Historic-Mansion-10-11-17.pdf>
- Tuck, Brigid and Neil Linscheid, "Profile of Mesabi Trail Visitors: People Traveling More than 50-Miles or Staying Voernight to Use the Trail." (2016) <https://conservancy.umn.edu/bitstream/handle/11299/197835/2017-mesabi-trail-visitor-profile.pdf?sequence=1>
- Tuck, Brigid and John Bennett, "Economic Contribution of 2019 Grandma's Marathon Weekend." (2019) <https://conservancy.umn.edu/handle/11299/212096>
- Wilder Research, "The Economic Impact of Minnesota State Colleges and Universities." (2006) <https://www.wilder.org/wilder-research/research-library/minnesota-state-colleges-and-universities-local-economic-impact>

Appendix B. Input-Output Modeling

Data Sources

This study uses the IMPLAN Group's input-output modeling data and software (IMPLAN version 3.1). The IMPLAN database contains county, state, zip code, and federal economic statistics, which are specialized by region, not estimated from national averages. Using classic input-output analysis in combination with region-specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate and adaptable model for its users. IMPLAN data files use the following federal government data sources:

- U.S. Bureau of Economic Analysis Benchmark Input-Output Accounts of the U.S.
- U.S. Bureau of Economic Analysis Output Estimates
- U.S. Bureau of Economic Analysis Regional Economic Information Systems (REIS) Program
- U.S. Bureau of Labor Statistics Covered Employment and Wages (CEW) Program
- U.S. Bureau of Labor Statistics Consumer Expenditure Survey
- U.S. Census Bureau County Business Patterns
- U.S. Census Bureau Decennial Census and Population Surveys
- U.S. Census Bureau Economic Censuses and Surveys
- U.S. Department of Agriculture Census

IMPLAN data files consist of the following components: employment, industry output, value added, institutional demands, national structural matrices, and inter-institutional transfers. Economic impacts are made up of direct, indirect, and induced impacts. The data used was the most recent IMPLAN data available, which is for the year 2020. All data are reported in 2021 dollars.

Economic impacts are made up of direct, indirect, and induced impacts. The following are suggested assumptions for accepting the impact model: IMPLAN input/output is a production-based model, and employment numbers (from U.S. Department of Commerce secondary data) treat both full- and part-time individuals as being employed.

Regional data for the impact models for value added, employment, and output are supplied by IMPLAN for this impact. Employment assumptions were provided to the model to enable construction of the impact model. From these data, social accounts, production, absorption, and byproducts information were generated from the national level data and was incorporated into the model. All region study definitions and impact model assumptions were agreed on before work with the models began.

Modeling Assumptions

The following are suggested assumptions for accepting the impact model:¹⁴

Backward-Linkages: IMPLAN is a backward-linkage model, meaning that it measures the increased demand on industries that produce intermediate inputs as a result of increases in production. However, if an industry increases production, there will also be an increased supply of output for other industries to use in their production. Models that measure this type of relationship are called forward-linkage models. To highlight this concept, consider the example of a new sawmill beginning its operations in a state. The increased production as a result of the sawmill's operations will increase the demand for lumber, creating an increase in activity in the logging industry, as well as other supporting industries such as electric transmission and distribution. IMPLAN's results will include those impacts but will exclude effects on any wood product manufacturers located nearby that might be impacted by the newly available supply of lumber.

Employment: IMPLAN input-output is a production-based model, and employment numbers (from U.S. Department of Commerce secondary data) treat both full- and part-time individuals as being employed.

Fixed prices and no supply constraints: IMPLAN is a fixed-price model. This means that the modeling software assumes no price adjustment in response to supply constraints or other factors. In other words, the model assumes that firms can increase their production as needed and are not limited by availability of labor or inputs and that firms in the local economy are not operating at full capacity.

Fixed production patterns: Input-output (I-O) models assume inputs are used in fixed proportion, without any substitution of inputs, across a wide range of production levels. This assumption assumes that an industry must double its inputs (including both purchases and employment) to double its output. In many instances, an industry will increase output by offering overtime, improving productivity, or improvements in technology.

Industry homogeneity: I-O models typically assume that all firms within an industry have similar production processes. Any industries that fall outside the typical spending pattern for an industry should be adjusted using IMPLAN's Analysis-by-Parts technique.

Leakages: A small area can have a high level of leakage. Leakages are any payments made to imports or value added sectors, which do not in turn re-spend the dollars within the region. What's more, a study area that is actually part of a larger functional economic region will likely miss some important linkages. For example, workers who live and spend outside the study area may actually hold local jobs.

¹⁴ Bureau of Economic Analysis https://www.bea.gov/papers/pdf/WP_IOMIA_RIMSII_020612.pdf