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Research Report

The Economic Impact of UMD Athletics' Public Events on the Arrowhead Region of Minnesota and Douglas County, Wisconsin

For the

UMD Department of Intercollegiate Athletics

and

UMD Department of Marketing and Public Relations

Bureau of Business and Economic Research

Labovitz School of Business and Economics

University of Minnesota Duluth

Driven to Discover℠

Research Team

UMD Labovitz School of Business and Economics

Bureau of Business and Economic Research

Monica Haynes, Director
Gina Chiodi Grensing, Editor/Writer
Alexander Hook, Undergraduate Research Assistant
Karen Haedtke, Executive Administrative Specialist
Bureau of Business and Economic Research
11 East Superior Street, Suite 210
Duluth, MN 55802
(218) 726-7895
z.umn.edu/bber

Project Contact
Lynne Williams
University Marketing and Public Relations Director
University of Minnesota Duluth
302A Darland Administration Building
1049 University Drive
Duluth, MN 55812
218-726-6141
lwilliam@d.umn.edu

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Executive Summary

ABOUT THE PROJECT

For over 85 years, the University of Minnesota Duluth's (UMD) Department of Intercollegiate Athletics has provided opportunities for student athletes and spectators to enjoy competitive recreation. Its 16 sports teams are members of the National Collegiate Athletic Association (NCAA) Division I (men's and women's hockey) or II (men's and women's basketball, men's and women's cross country, men's and women's track and field (outdoor and indoor), women's soccer, women's tennis, baseball, softball, football, and volleyball).

The high caliber of these Division I and II teams makes them a draw for spectators of all ages. As such, the UMD Department of Intercollegiate Athletics (UMD Athletics) contacted the Bureau of Business and Economic Research (BBER) at the University of Minnesota Duluth's Labovitz School of Business and Economics to study the economic benefits that this organization's public sporting events have on Northeastern Minnesota and Douglas County, Wisconsin. Data used were provided by the UMD Athletics Department (see Team Inputs for more information).

UMD Athletics contributes to the local economy in three ways – through their own operational spending, through the visiting sports teams, and through the tourism created by visiting fans.

Annually, UMD Athletics' operations creates and supports over 90 jobs through direct, indirect, and induced impacts. Additionally, over $14 million dollars in annual output is added to the region's economy in a typical year.

In this report, contributions to the economy by the visiting sports teams and their spectators reflect the contributions of seven of the 16 sports, which represent the vast majority of event attendance and spending in the study area. These seven sports attract nearly 44,000 overnight guests to the study area, bringing in over $11 million in spending. The visitor spending contributes over $9 million in direct spending to the region, while creating and supporting over 175 jobs and producing over $14 million in total output.

Finally, the visiting NCAA Division I and Division II sports teams spend roughly $225 thousand each year in the eight-county study area, which creates additional economic benefits for the community. Spending by visiting teams creates and supports a total of four jobs and over $300 thousand in total output for the area.

In total, the UMD Athletics Operations, as well as the created tourism and economic impact from visiting teams employs over 250 people and brings nearly $26 million in total economic output to the eight-county region (see table below as well as on page 7 in Conclusions).

Total Combined Economic Impact by UMD Athletics, Typical Year, in Millions 2017 Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	217	$7.9	$11.2	$20.1
Indirect Effect	19	$0.8	$1.2	$2.7
Induced Effect	24	$0.9	$1.6	$3.0
Total Effect	260	$9.6	$14.0	$25.8

SOURCE: IMPLAN 2017

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Bureau of Business and Economic Research
Labovitz School of Business and Economics
University of Minnesota Duluth

The Economic Impact of the UMD Athletics' Public Events on the Arrowhead Region of Minnesota and Douglas County, Wisconsin

I. Project Description

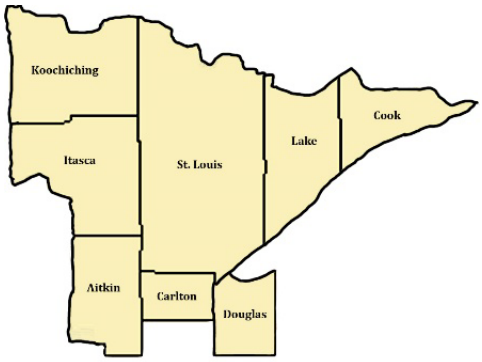
Since 1931, the University of Minnesota Duluth's (UMD) Department of Intercollegiate Athletics has given student athletes the ability to compete at both NCAA Division I and Division II levels. In the department's history, the UMD Bulldogs have won a total of eight national championships and have produced numerous athletes who have gone on to successful professional careers. UMD intercollegiate athletes are also successful academically. In the 2016-2017 academic year, UMD student athletes had a combined GPA of 3.21, which surpassed the school's highest mark of 3.18, set the previous academic year.

The UMD Department of Intercollegiate Athletics (UMD Athletics) contacted the Bureau of Business and Economic Research (BBER) at the University of Minnesota Duluth's Labovitz School of Business and Economics to study the economic impact that this organization's public sporting events have on the Arrowhead region of Minnesota and on Douglas County, WI.

Study Area

The geographic scope for this economic impact analysis is the Arrowhead region of Northeastern Minnesota, which includes the counties of Aitkin, Carlton, Cook, Itasca, Koochiching, Lake, and St. Louis; along with Douglas County, Wisconsin.

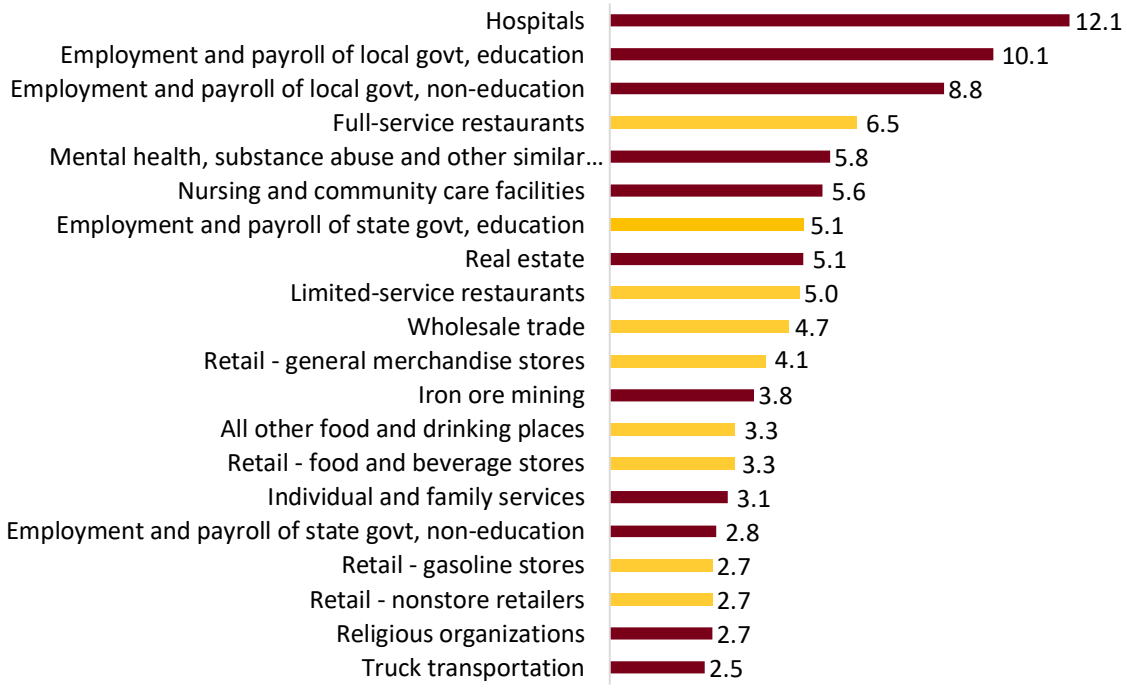
Figure 1. Study Area Counties



SOURCE: WIKIPEDIA. ORG

Figure 2, displayed below, is included to provide context for the study results. This figure shows the largest industries in the study area based on total employment in 2015. The three industries that employed the greatest numbers are hospitals, local public education, and local government, each of which employed more than 8,000 workers throughout the study area. The industries highlighted in gold were used in modeling the impacts of UMD Athletics, whether through its operations or through increased tourism from the sporting events. Tourism industries include full-service and limited-service restaurants, many various retail sectors, as well as accommodations and recreation.

Figure 2. Top 20 Industries by Employment, in Thousands, 2015



SOURCE: IMPLAN 2017

II. Inputs

As a whole, UMD Athletics provides economic impact to the area three ways. The first is the operation of the Athletic department itself. This includes both the wages and salaries of employees and the purchasing of equipment and other departmental expenditures. The second is the increased tourist spending by UMD and opponent fans from outside of the study area. While these tourists spend large amounts on food and accommodations, they often spend in retail and recreation as well, typically doing some shopping and enjoying other recreational opportunities while visiting Duluth. The third impact is from visiting sports teams that compete against UMD. These teams' spending consists of mostly accommodations and food.

Operations Inputs

UMD Athletics spends nearly $6 million per year on operations expenses. A majority (roughly 80%) of the department's spending is made up of wages and benefits for its 64 employees. Table 1 shows a detailed breakdown of the department's spending.

Table 1. UMD Athletics Operations Expenditures, Typical Year, in Thousands

Budget item	***Total***
Wages and Benefits	$4,639.8
Transportation	$407.5
Equipment and Machinery	$266.8
Professional Services	$150.3
Administrative Services	$128.3
Maintenance	$65.0
Advertising	$55.0
Royalties & Licensing	$50.0
Total Costs	$5,762.6

SOURCE: UMD ATHLETICS DEPARTMENT

After employee wages and benefits, UMD Athletics spends the most on transportation annually. Equipment and machinery, which includes sporting equipment and video and audio equipment, is another large expenditure. Smaller expenditures include professional and administrative services, such as advertising. The smallest expenditure is for royalties and licensing, which is the money spent to provide copyrighted materials, such as specific songs played at the sporting events.

Tourist Inputs

The second economic benefit garnered from UMD Athletic events is the added tourism dollars. UMD Athletics provided event attendance numbers for seven of the school's 16 sports teams (football, men's and women's basketball, men's and women's hockey, women's soccer and volleyball) from the 2016-17 academic year. Not included in this report are men's and women's cross-country, men's and women's track and field (both indoor and outdoor), baseball, softball, and women's tennis.

According to the UMD Athletics department, the seven sports included represent a large majority of all tourism created annually. While the other sports do bring spectators and visiting teams, the number of visitors is small by comparison. Therefore, it should be noted that the estimates included in this report likely underestimate the true economic impacts from visiting teams and tourists, but only marginally so.

The department identified two types of guests: day guests, who are typically residents of the study area, and overnight guests, who are typically residents from outside the study area. By definition, those who live inside the study area, day guests, are not considered tourists. Therefore, this report focuses solely on the economic impact of overnight guests. Table 2, below, shows the estimated spending pattern for the nearly 44,000 overnight guests visiting annually as a result of UMD sporting events.

Table 2. Total Tourist Expenditures, Typical Year, in Thousands

Budget item	*Total*
Food and Beverage	$4,021.7
Transportation	$3,967.2
Retail	$1,871.1
Recreation	$1,307.9
Lodging	$610.3
Total Costs	***$11,778.3***

SOURCE: UMD ATHLETICS DEPARTMENT

Food and Beverage expenses were calculated using GSA per diem rates for meals and incidentals and adding a per person increase for concession spending. The concession spending was taken from an aggregate of previous literature regarding concession spending at similar events.

The transportation spending pattern was created by estimating driving distances between an opponent college and UMD, as well as notable regional cities from where fans may be traveling for the event. Also included in this spending pattern is a small percentage of flights into Duluth for parents, scouts, and other fans who may not live in the region.

The retail and recreation spending patterns were created using figures from previous similar BBER studies and from other relevant tourism studies.[1]

The spending pattern for lodging was created by taking the average cost of a hotel room in Duluth and assuming that two individuals were sharing a room.

A more detailed description of all tourism inputs is included in Appendix A, Model Assumptions.

Team Inputs

The final area of economic impact that UMD Athletics creates in the Arrowhead region and Douglas County, Wisconsin is through visiting athletic teams.

The spending pattern for the visiting athletic teams was composed of four main expenditures, displayed in Table 3 on the next page.

[1] University of Minnesota Duluth's Bureau of Business and Economic Research, The Economic Impact of the Duluth Amateur Hockey Association on the City of Duluth, 2015; UMD's BBER, The Economic Impact of the Duluth Curling Club on the City of Duluth, 2015; University of Minnesota Tourism Center, Assessing the Annual Economic Impact of the Grand Rapids IRA Civic Center, 2015

Table 3. Total Team Expenditures, Typical Year, in Thousands

Budget item	***Total***
Hotel & Accommodations	$124.2
Food	$79.6
Retail	$15.2
Transportation	$5.6
Total Costs	***$224.6***

SOURCE: IMPLAN 2017

The hotel and accommodations expenditure was calculated by estimating the mean cost for a hotel room in Duluth and with the assumption that two athletes or coaches would be sharing a room. It is important to note that for most sports, the teams and coaches do not often stay in Duluth before or after competitions. Only the hockey teams consistently stay overnight in the Duluth area, as they typically play on two consecutive nights. This was taken into consideration when calculating the visiting team spending values shown in Table 3.

III. Findings

Operations

Results of modeling are shown in Table 4. Total effects are broken into three components: direct, indirect, and induced. Direct effects represent the employment and spending coming from the department itself on wages, equipment, and supplies. Indirect effects measure increased inter-industry spending on the part of regional businesses and suppliers as a result of the Athletics department's direct spending. Induced effects reflect an increase in household spending by UMD Athletics' employees as well as the employees of businesses that serve UMD Athletics. To estimate the on-going impact from the UMD Athletics department, the BBER used the term "Typical Year" to represent the impact for each year of operations. All results are shown in 2017 dollars.

Table 4. Total Operations Impact, Typical Year, in Millions 2017 Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	64	$4.6	$5.9	$10.5
Indirect Effect	2	$0.1	$0.1	$0.3
Induced Effect	27	$1.1	$1.9	$3.4
Total Effect	94	$5.8	$7.9	$14.3

SOURCE: IMPLAN 2017

Results are measured in employment, labor income, value added, and output. The column labeled employment in Table 4 shows the number of jobs that UMD Athletics supports directly and through induced and indirect effects. Direct employment refers to the number of workers employed directly by UMD Athletics. Employment estimates are in terms of jobs, not in full-time equivalencies. In a typical year of operations, UMD Athletics employs 64 individuals directly and supports another 29 jobs regionally in supporting industries. Therefore, the eight-county study area sees a total of 94 jobs as a result of UMD Athletics' operations.

The column labeled labor income is the total of all employee compensation. This includes wages, benefits, and proprietor income. In a typical year of operations, UMD Athletics directly spends over $4.6 million on wages and benefits for its employees. Additionally, UMD Athletics supports over $1 million in indirect and induced labor income during a typical year.

The third column, labeled value added, refers to the contribution to the GDP made by an individual producer, industry, or sector. UMD Athletics, itself, creates a total of nearly $6 million in value added each year, and through its operations it supports just over $2 million in additional value added (the total of the induced and indirect effects).

Output, the last column in the table, is the total value of all local production required to sustain activities. In a typical year of operations, UMD Athletics creates over $10 million annually in direct output. Along with nearly $4 million in induced and indirect output, the UMD Athletics department creates just over $14 million in total output each year of operation.

Tourists

A total of nearly 44,000 overnight guests came to the Arrowhead Region and Douglas County for the UMD sporting events included in this study. Numbers of overnight guests were estimated using attendance data for the UMD Athletics sporting events. As noted previously, these guests spend roughly $12 million dollars a year in the study area (see Table 2, page 4). However, due to margining, the actual direct output will be lower than the tourist spending. Retail industries have margins on their goods, and only a portion of each sale is introduced into the local economy. In this case, the direct output due to tourist spending is just over $9 million.

Table 5. Total Tourism Impacts, Typical Year, in Millions 2017 Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	150	$3.2	$5.2	$9.4
Indirect Effect	16	$0.7	$1.1	$2.3
Induced Effect	21	$0.8	$1.4	$2.3
Total Effect	187	$4.7	$7.7	$14.3

SOURCE: IMPLAN 2017

Table 5 shows the economic impact of these tourists. In total, the tourism generated from UMD Athletics creates 150 jobs directly and supports another 37 jobs in the eight-county region. These tourists also combine to create a total of over $14 million in output with over $9 million directly created through their spending.

Teams

Every year, the seven UMD teams included in this report combine to bring roughly 3,000 visiting athletes and coaches to the study area. These athletes and coaches combine to spend nearly $225,000 (Page 5, Table 3) in the eight counties. The direct output, roughly $200,000, is less than the actual spending due to margining. Retail industries have margins on their goods, and only a portion of each sale is introduced into the local economy. Table 6 on the next page shows the economic impacts of that spending, in thousands of dollars.

Table 6. Total Team Impact, Typical Year, in Thousands 2017 Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	3.2	$71.8	$117.7	$200.1
Indirect Effect	0.3	$14.0	$21.8	$47.8
Induced Effect	0.5	$17.8	$31.6	$58.5
Total Effect	4	$103.7	$171.2	$306.4

SOURCE: IMPLAN 2017

In total, the visiting athletes and coaches create and support roughly three jobs directly, four in total, due to their spending in the study area. Additionally, over $200,000 in direct output is created for the eight-country region by these visiting teams and coaches, with a total output of over $300,000.

IV. Conclusions

UMD Athletics impacts the region's economy in three ways. The first is their own operations and expenditures. The second is the spending of sports teams who visit the region to compete against UMD's NCAA Division I and II sports teams. The final, and largest, economic impact that UMD Athletics generates for the region is the spending by more than 44,000 overnight tourists who visit the study area to watch the UMD sporting events. Table 7 shows the combined effect that these three impact areas have, thereby showing the total impact of UMD Athletics on the eight-county study region.

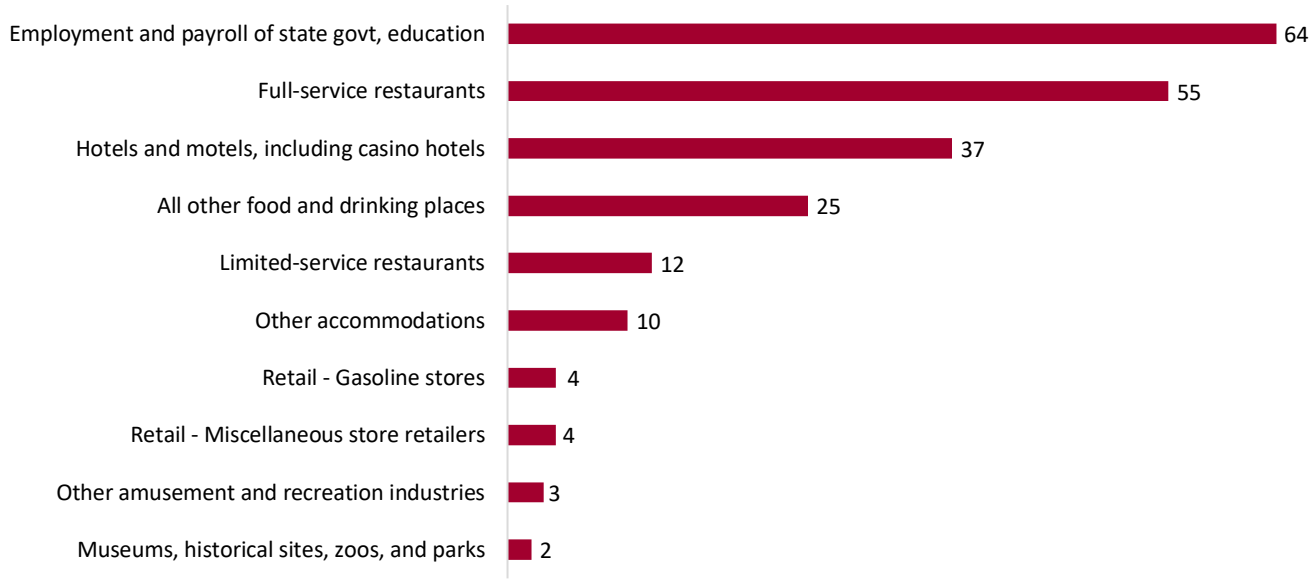
Table 7. Total Combined Economic Impact by UMD Athletics, Typical Year, in Millions 2017 Dollars

Impact Type	*Employment*	*Labor Income*	*Value Added*	*Output*
Direct Effect	217	$7.9	$11.2	$20.1
Indirect Effect	19	$0.8	$1.2	$2.7
Induced Effect	24	$0.9	$1.6	$3.0
Total Effect	260	$9.6	$14.0	$25.8

SOURCE: IMPLAN 2017

UMD Athletics, itself, along with the visiting sports teams and overnight tourists combine to bring over $20 million in direct output and nearly $26 million in total output, giving the organization an economic output multiplier of 1.28. The multiplier suggests that, for every dollar the UMD Athletics organization spends, another $0.28 ripples through the local economy as a result. The three impact areas also combine to create 260 jobs in the study area. Finally, almost $10 million in labor income and over $14 million in value added are created in the area.

Figure 3. Top Ten Industries, by employment created, from UMD Athletics Impacts



SOURCE: IMPLAN 2017

Figure 3 shows the ten industries that received the largest employment impacts from the UMD Athletics department's operations and created tourism. The tourist and team impacts contribute high employment in hospitality sectors, such as restaurants and lodging, as well as marginal gains in retail sectors and some entertainment and recreation sectors. The largest impacted industry, employment and payroll of state government, education refers to the direct employment of the UMD Athletics department. These ten sectors combine to create over 75% of all direct, indirect, and induced employment in this study.

NOTE - Readers are also encouraged to remember the UMD Labovitz School's BBER was asked to supply an economic impact analysis only. Any subsequent policy recommendations should be based on the "big picture" of total impact.

Appendix A. Model Assumptions

Operations Assumptions

All spending figures given from UMD Athletics Department in good faith

Tourist Assumptions

Hotels

- Average hotel rates for the city of Duluth were used. Two people would share a room.
- Transportation - GSA rates were used for driving mileage
- 80% driving from local/regional areas - half of transportation expenditures were local
- 15% driving from other schools – ¼ is spent locally
- 5% flying from outside the region, ¼ of flight expenditures are local

Table 8. UMD Athletics Department Opponent Travel Distance

Competing School	*Distance in Miles*	*Competing School*	*Distance in Miles*
Grand Forks (UND)	262	Bemidji (BSU)	150
St. Cloud (SCSU)	144	St. Paul (Concordia)	153
Kalamazoo (WMU)	626	Mankato (MSUM)	235
Miami (UMO)	782	Crookston (UMC)	237
Omaha (UNO)	533	Minot (MSU)	473
Denver (UD)	1066	Aberdeen (NSU)	378
Colorado Springs (CC)	1,134	Marshall (SWMSU)	276
Sioux Falls (Augustana)	390	Fayette (UIU)	331
Winona (WSU)	221	Detroit (WSU)	760

SOURCE: GOOGLE MAPS

Food and Beverage

- GSA rates minus incidentals + $4 for concessions on game day
- Retail
- $15 per person per day, (from Itasca and UMN Extension Tourist Center
- Recreation
- $7 per person per day, from additional BBER and other entity studies[2]

[2] University of Minnesota Duluth's Bureau of Business and Economic Research, The Economic Impact of the Duluth Amateur Hockey Association on the City of Duluth, 2015; UMD's BBER, The Economic Impact of the Duluth Curling Club on the City of Duluth, 2015; University of Minnesota Tourism Center, Assessing the Annual Economic Impact of the Grand Rapids IRA Civic Center, 2015

Team Assumptions
Assumed team and coaching staff sizes are similar to UMD

Transportation
- Assumed bus rides from average distance of competing schools, used GSA rates, ¼ of spending is local (Table 8 above)

Food
- GSA rates for 1.5 meals per day locally

Retail
- $5 per person per day, based on estimates from the 2015 University of Minnesota Tourism Center study

Accommodations
- Average hotel room price for the city of Duluth, split between 2 athletes. These rooms were for hockey teams only, as most other teams do not stay the night.

Appendix B. Economic Impact Procedures and Data Sources

Input-Output Modeling

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 2015. All data are reported in 2017 dollars.

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.

Appendix C. IMPLAN Assumptions

The following are suggested assumptions for accepting the impact model:[3]

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 or improving productivity or 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.

[3] Bureau of Economic Analysis https://www.bea.gov/papers/pdf/WP_IOMIA_RIMSII_020612.pdf

Appendix D. Definitions Used in this Report

Analysis by parts: The process of splitting or parsing an impact analysis issue into smaller and more specific parts. This technique allows the user to specify the amount of commodity inputs, the proportion of local labor income, and the proportion of local purchases.

Direct effect: Initial new spending in the study area resulting from the project.

Employment: Estimates (from U.S. Department of Commerce secondary data) are in terms of jobs, not in terms of full-time equivalent employees. Therefore, these jobs may be temporary, part-time, or short-term.

Gross output: The value of local production required to sustain activities.

Indirect effect: The additional inter-industry spending from the direct impact.

Induced effect: The impact of additional household expenditures resulting from the direct and indirect impact.

Labor income: All forms of employment income, including employee compensation (wages and benefits) and proprietor income.

Leakages: Any payments made to imports or value added sectors that do not in turn re-spend the dollars within the region.

Margins: The value of wholesale and retail trade services provided in delivering commodities from producers' establishments to purchasers. 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. (BEA)

Multipliers: Total production requirements within the Study Area for every unit of production sold to Final Demand. Total production will vary depending on whether Induced Effects are included and the method of inclusion. Multipliers may be constructed for output, employment, and every component of value added.

Value added: A measure of the impacting industry's contribution to the local community; it includes wages, rents, interest, and profits.