

# **ECONOMIC ANALYSIS**

**An Extension  
Community  
Economics Program**

## **An Economic Analysis of Minnesota's Arts and Cultural Heritage Fund Monies:**

**Preserving the Arts, History,  
Cultural Heritage and Economy of Minnesota**



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This report is the result of collaboration between the University of Minnesota and the Minnesota Historical Society. The University of Minnesota Extension Center for Community Vitality provided researchers, input, and resources for the project. Bruce Sorte, Visiting Assistant Professor, served as the primary researcher for this project with assistance from Brigid Tuck and David Nelson. Dr. William F. Lazarus, Department of Applied Economics, University of Minnesota, reviewed the report and significantly contributed to its clarity and theoretical integrity. The Minnesota Historical Society provided initial data and funding for the research.

Photos courtesy of Minnesota Historical Society

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## INTRODUCTION

“Minnesota voters passed a constitutional amendment in 2008 creating a new 3/8-cent sales tax to support outdoor heritage, clean waters, sustainable drinking water, parks and trails, arts, history and cultural heritage projects and activities. Of the total proceeds from the sales tax, 19.75% are dedicated to the Arts and Cultural Heritage Fund (ACHF) to support “...arts, arts education and arts access and to preserve Minnesota’s history and cultural heritage.” Based on current sales tax revenue, the people of Minnesota will invest more than \$1.2 billion in ACHF programs and projects over the 25-year life of the tax. Fund investments will support arts, history and cultural heritage organizations that are already a vital economic engine for the State; New activities will enhance the economic engine and add to the economic effects; elevating Minnesota’s resourcefulness and increasing its creative capital. ACHF will provide the state and its people a positive return on their investment.”<sup>1</sup>

Minnesotans made a significant commitment to the past and future by creating the Arts and Cultural Heritage Fund (Fund). In addition to preserving and providing access to Minnesota’s heritage, the expenditures from the Fund were expected to reinforce the Minnesota economy. The University of Minnesota (UofM) was asked to answer the question: “What are the economic effects of the of the Fund supported grant, contracts and programs awarded and managed by the Minnesota Historical Society (MNHS)?” The MNHS contracted with the UofM’s Extension Community Vitality Program to analyze the expenditures and how those expenditures affected the whole Minnesota economy.

In this report we note the highlights of the analysis, explain our methodology and the study area, describe the types of grants and contracts that the MNHS awarded from the Fund, detail the economic effects of those grants and contracts as the related spending worked its way through the Minnesota economy, alert the reader to the limitations of this type of analysis, and draw some conclusions from our interpretation of the results. This analysis provides a conservative estimate of the economic effects of spending from the Fund since we did not include any estimates of the additional tourism that may result from these projects. As the funded projects are completed, they are likely to significantly increase the visits to heritage sites and facilities that provide references to the sites (e.g. libraries). This tourism by Minnesotans and visitors from outside Minnesota will increase the economic effects beyond our estimates and the visitors from outside Minnesota could provide significant economic impacts that can be attributed to the Fund.



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<sup>1</sup> *Minnesota State of Innovation – A Twenty-Five Year Vision, Framework, Guiding Principles, and Ten-Year Goals for the Minnesota Arts and Cultural Heritage Fund* January 1010. Submitted by the Arts and Cultural Fund Planning Committee. St. Paul, Minnesota: Minnesota Historical Society.

## Highlights of the Economic Analysis of Minnesota's Arts and Cultural Heritage Fund

This 2011 study, conducted by University of Minnesota Extension, examined the economic effects of the grants and contracts awarded and managed by the Minnesota Historical Society using dollars from the Minnesota Arts and Cultural Heritage Fund. The analysis found:

- Spending on projects from the Fund was \$22 million and it generated another \$20.3 million in output or sales effects for a total of \$41.6 million in the Minnesota economy.
- Employment in full- and part-time jobs from the initial Fund expenditures was approximately 244 jobs. The responding by the people in those jobs with suppliers for the projects and household consumption using income earned to complete the projects supported another 160 jobs for a total of 404 jobs.
- Value added including employee compensation, proprietor income, property income (rents and leases) and indirect business taxes comprised approximately 57% of the expenditures or \$12.2 million and after its effects were multiplied in the economy another \$12.1 million was received by businesses owners, employees and government for a total of \$24.3 million.
- Spending from the Fund affected 408 of the 418 or 97.6% of the sectors in the Minnesota economy.



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## **Profile of Study Area Economy**

Spending from the Fund was well distributed geographically across Minnesota. Projects were completed in all of Minnesota's 87 counties. Therefore, the selected study area for the report was the whole state. Minnesota's economy is diverse enough to capture a high percentage of the spending on these projects.

Even in 2009, during the economic downturn and the period for which we have the most current data, Minnesota industries produced; \$494.6 billion in output or sales, 3,390,196 full- and part-time jobs and \$268.4 billion in value added income and indirect business taxes per Table 1.

**Table 1. Minnesota Industrial Detail (2009) - North American Industrial Classification (NAICS) System Aggregation**

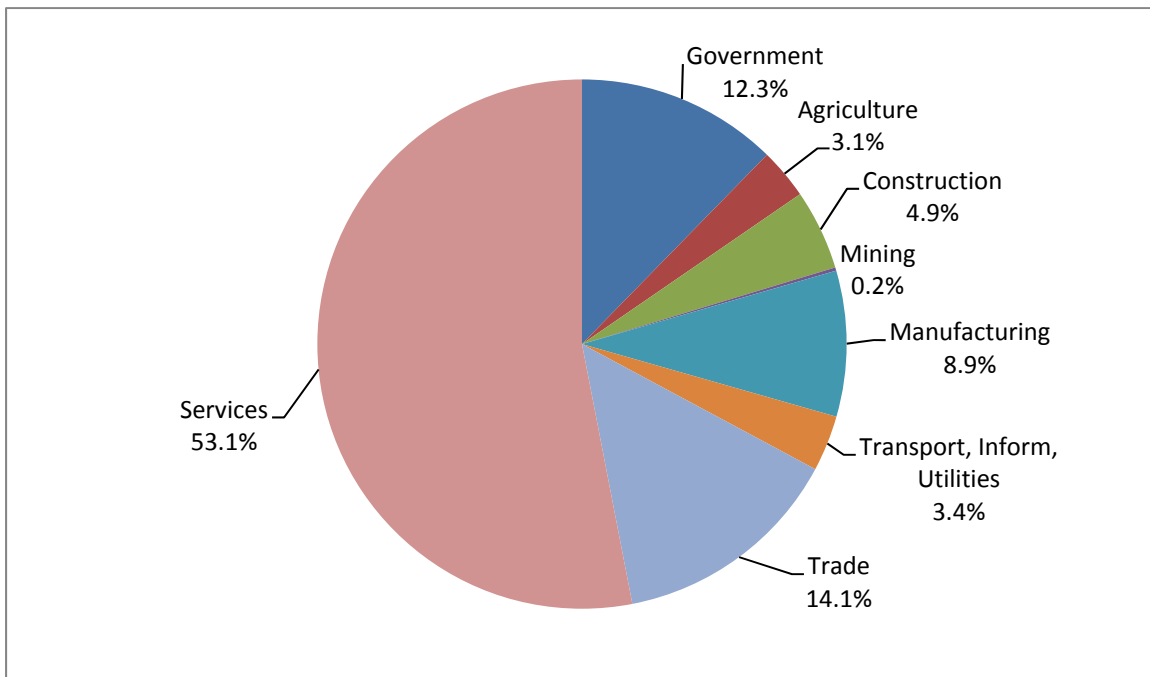
Classification	Output (billions)	Employment	Value Added (billions)
Agriculture	\$14.2	103,722	\$5.5
Mining	3.1	7,146	1.2
Construction	20.4	167,189	9.5
Manufacturing	123.8	302,364	34.6
Transportation, Information, and Public Utilities	23.5	116,344	12.5
Trade	46.0	477,932	33.7
Service	232.3	1,797,439	143.8
Government	31.3	418,060	27.5
Total	\$494.6	3,390,196	\$268.4

Source: MIG, IMPLAN 2009

In this report we focus on employment and value added as metrics to measure the economic effects of the Fund expenditures. Employment includes both full- and part-time jobs and does not necessarily represent individual people or full-time equivalent jobs.

Figure 1 shows the employment of the different sectors in the whole Minnesota economy as percentages of the total employment in Minnesota.

**Figure 1. Minnesota Employment by NAICS Sector (2009) – %**



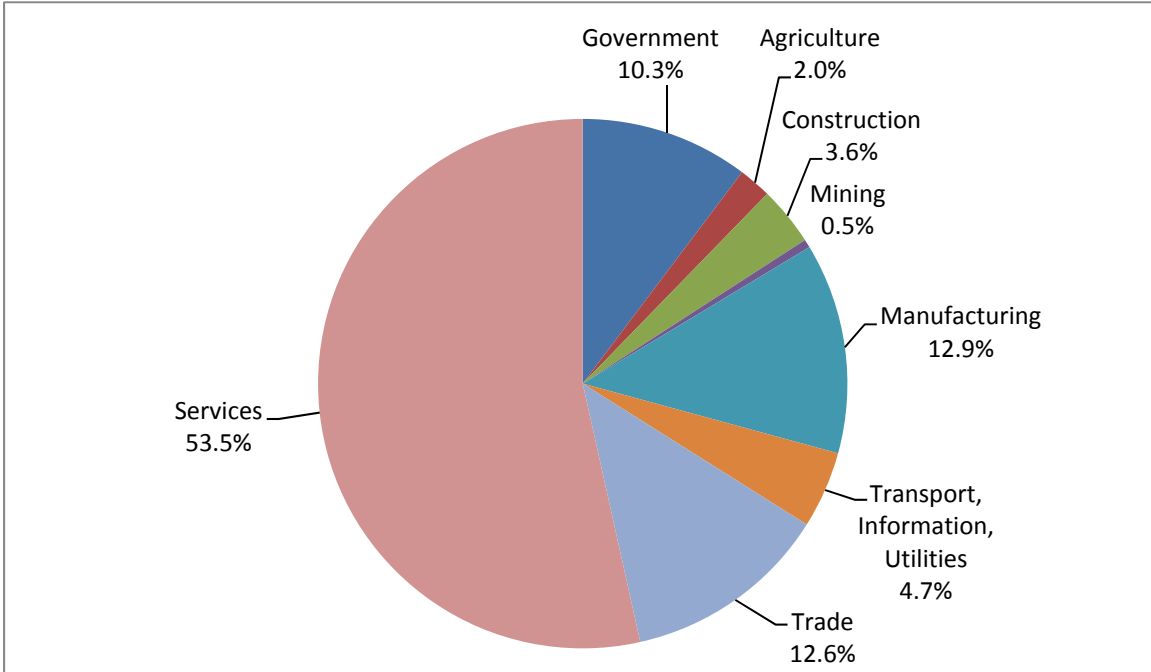
Minnesota's service sectors continue to grow, currently comprising 53.1% of employment. Fund expenditures and projects relied heavily on these service industries, which kept the dollars within the State.

The value added metric in contrast to the output or sales metric avoids "double counting" and removes the influence of goods and services purchased outside Minnesota. Value added includes the income received by employees and proprietors, property income from rents and leases, and indirect business taxes. As an example, if a construction contractor working on a Fund project purchases fuel for his pickup, that cost will be included in the price and be included in the output or sales column in Table 1, even if most of the cost of fuel is for refining by and transporting it from out-of-state businesses. The sale of the fuel will be recorded as a sale from the distributor to the service station, the price of the fuel from the distributor will once again be counted in the price of the gasoline when it is sold to the contractor and the contractor will include the cost of his transportation on the job in the price of his services, counting the value of the fuel for a third time.

Alternately, the salary paid to the contractor worker, if he resides in Minnesota, reflects an added value to the structure or project that is uniquely generated in Minnesota. His income is part of value added, a portion of the state product and counted only once.

Figure 2 shows the different components of Minnesota's value added or state product as percentages of the total value added by Minnesota industries.

**Figure 2. Minnesota Value Added Product by NAICS Sector (2009) – %**



Both jobs and value added are effective ways of considering economic effects. The next section describes how the Fund expenditures contributed to these two measures.

## ***Economic Analysis***

### Economic Effects

In this analysis we estimate the economic effects of \$21,320,290 that the MNHS awarded for more than 550 projects and a portion used to administer the program. The remaining \$679,710 of the \$22 million was a land purchase.

Since I-O analysis only allows us to consider changes in an economy, we were not able to project the economic effects of the \$679,710 land purchase on Leech Lake that was completed in collaboration with The Public Land Trust and The Leech Lake Band of Ojibwe. The initial purchase is an exchange of assets that already exist and no new economic effect other than minimal transaction costs to effect the transfer is created. The economic effects of this land purchase will become clearer over time by how the land is used in the future compared to how it was used in the past. At some future point, the effects could be estimated if desired.

Table 2 shows the different programs in which expenditures were made and which we considered as the direct economic effects of the Fund.

**Table 2. Fund Expenditures 2010/2011**

Programs/Individual Grants and Contracts	MNHS Expenditure/Grant- Output Direct Effects
Statewide Historical Programs	\$7,833,081
Statewide History Partnership Projects	\$3,399,109
Exhibit on Minnesota's Regions and Cultures	\$2,500,000
Statewide Survey of Historical and Archaeological Sites	\$500,000
Minnesota Digital Library	\$500,000
Historical and Cultural Heritage Grants Program	\$6,588,100
Total Biennial Effect	\$21,320,290

\*Data provided by the Minnesota Historical Society

We entered the expenditures that are summarized in Table 2 into the I-O model as purchases from many types of businesses and agencies throughout the Minnesota economy. Then, using the I-O model we calculated the subsequent indirect and induced expenditures or effects. They were added to the direct effects to determine the total economic effects of the Fund expenditures. The direct output effects from Table 2 are shown in the first two columns of Table 3.



In Table 3, the direct effects of the expenditure or output are also shown as jobs in the third column and their value added component is noted in the fourth column – the portion of the direct expenditures that would be uniquely generated in Minnesota. Then, the responding or “ripple” effects(indirect and induced) are added to the direct effects and the total effects are shown as output in the fifth column, employment in the sixth column and value added in seventh column.

**Table 3. Economic Footprint of the Fund Expenditures 2010/2011**

<i>Programs/Individual Grants &amp; Contracts</i>	<i>MNHS Expenditure/Grant - Output Direct Effects</i>	<i>Employment - Full &amp; Part-time Direct Effects</i>	<i>Value Added of Direct Effects</i>	<i>Output - Direct, Indirect &amp; Induced Effects</i>	<i>Employment - Full &amp; Part-time Direct, Indirect &amp; Induced Effects</i>	<i>Total Value Added - Labor, Proprietor and Property Income and Indirect Business Taxes</i>
Statewide Historical Programs	\$7,833,081	116	\$4,602,117	\$15,540,534	177	\$9,221,101
Statewide History Partnership Projects	\$3,399,109	40	\$1,854,677	\$6,929,891	68	\$3,953,126
Exhibit on Minnesota's Regions and Cultures	\$2,500,000	23	\$1,466,415	\$4,664,543	39	\$2,787,295
Statewide Survey of Historical and Archaeological Sites	\$500,000	6	\$248,550	\$1,082,168	12	\$598,045
Minnesota Digital Library	\$500,000	4	\$323,362	\$1,021,941	9	\$636,018
Historical and Cultural Heritage Grants Program	\$6,588,100	55	\$3,696,888	\$12,336,399	99	\$7,083,523
<b>Total Biennial Effect</b>	<b>\$21,320,290</b>	<b>244</b>	<b>\$12,192,009</b>	<b>\$41,575,476</b>	<b>404</b>	<b>\$24,279,109</b>

Each dollar spent on a project (shown as a direct output effect in Table 3) contributed another 95 cents as it rippled throughout the economy. Each job that was directly related to a project also contributed to two-thirds of another job. Each value added dollar contributed another 99 cents of value added. We can also estimate, although roughly, that \$1.4 million dollars of tax revenue was returned to Minnesota through all this economic activity. Those tax dollars can be reallocated in another cycle of spending.

When the employment effects of the Fund expenditures are shown by NAICS two-digit detail in Table 4, it is important to note that some of the sectors that have been the most disrupted by the recent economic downturn – Construction(24), Retail Trade(20) and Arts – entertainment & recreation(69), received a significant portion of the benefits from these expenditures. In this analysis, we included both the private and public education and health care effects in the private sectors by those names. The government sector does not include educational or health care related effects in Table 4 and Table 5.

**Table 4. Employment Effects by NAICS Sector of Fund Expenditures**

Description	Full-and Part-Time Jobs
Total	404
Ag, Forestry, Fish and Hunting	2
Mining	2
Utilities	2
Construction	24
Manufacturing	5
Wholesale Trade	4
Retail Trade	20
Transportation and Warehousing	16
Information	21
Finance and Insurance	10
Real Estate and Rental	17
Professional – Scientific and Technical Services	30
Management of Companies	17
Educational Services	92
Health and Social Services	20
Arts – Entertainment and Recreation	69
Accommodation and Food Services	13
Other Services	39
Government	3

\*Estimates by University of Minnesota Extension Center for Community Vitality

The value added effects shown in Table 5 are significant and more than many other types of expenditures provide in the economy. A high proportion of the projects that were funded relied heavily on people and services. Examples include creating a digital library, a trail, or presenting a program.

Services are more likely to be locally provided by Minnesota businesses and people resulting in more dollars staying in Minnesota. The direct output and value added effects almost doubled and the employment effects increased by 66%. It is also important to note that in the two digit NAICS aggregation, manufacturing is very inclusive and it can be difficult to get an inclusive estimate for a particular industry. An example is the employment and value added effects in the Ag, Forestry, Fish & Hunting sector are quite modest. However, those jobs and dollars only reflect the basic harvest level for each industry and do not include the forward linkages like wholesale trade, transportation and warehousing, processing – which is in manufacturing, retail sale of the products, and even food services for agricultural goods that are typically considered part of the agribusiness or forestry industries.

**Table 5. Value Added Effects by NAICS Sector of the Fund Expenditures**

Description	Thousands of Dollars (000)
Total	\$24,279
Ag, Forestry, Fish and Hunting	26
Mining	16
Utilities	286
Construction	1,336
Manufacturing	529
Wholesale Trade	587
Retail Trade	894
Transportation and Warehousing	912
Information	1,830
Finance and Insurance	1,376
Real Estate and Rental	2,864
Professional – Scientific and Technical Services	2,813
Management of Companies	852
Educational Services	2,685
Health and Social Services	1,086
Arts – Entertainment and Recreation	3,831
Accommodation and Food Services	350
Other Services	1,665
Government	194

\*Estimates by University of Minnesota Extension Center for Community Vitality

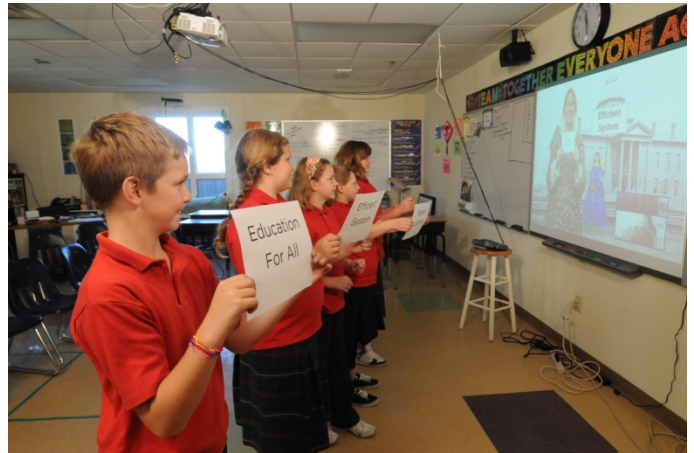
### Reminders

IMPLAN is widely used by economists for economic contribution analysis because: it can measure output and employment impacts; is available on a county-by-county basis; is flexible for the user; and it can be modified to reflect local conditions. Due to these reasons, the IMPLAN model was used for this analysis. IMPLAN has some limitations and qualifications that need to be kept in mind. IMPLAN is static and represents a snapshot in time.

It is linear and does not change how goods or services are produced as more or fewer of them are purchased (e.g. as demand for a business increases it may purchase a machine to do some of the work and jobs will not increase proportionate to the increased demand as we would estimate using the IMPLAN model). IMPLAN also assumes there will always be sufficient supply to satisfy changes in demand at the same price levels. Certainly, this may not always be

the case. A benefit of the linear nature of the IMPLAN model and the estimates we provided is they can be adjusted easily by the reader.

Considering the type and scale of the projects in this analysis these limitations are unlikely to seriously affect the accuracy of the estimates. In fact, since there were so many projects and they were so widely distributed, it is probable that many smaller businesses provided goods and services. They do not typically attain the level of economies of scale that other larger contractors or businesses achieve and are more labor intensive. Therefore these estimates may be conservative.



## ***Conclusions***

In 2008, Minnesota voters approved a constitutional amendment creating a 3/8 cents sales tax to support outdoor heritage, clean waters, sustainable drinking water, parks and trails, arts, history and cultural heritage projects and activities. A significant share (19.75 percent) of the new revenue generated by the tax is dedicated to the Arts and Cultural Heritage Fund. The Minnesota Historical Society expended nearly \$22 million of the Fund in grants, contracts, and programs during 2010 and into 2011. University of Minnesota Extension conducted this study, on behalf of the Minnesota Historical Society, to determine how expenditures of the fund contributed to the Minnesota economy.

As a result of \$22 million in spending from the Fund, another \$20.3 million in economic activity occurred in the state. Since Fund expenditures occurred in every county, the entire state Minnesota benefited economically from the spending. In total, Arts and Cultural Heritage Fund expenditures generated \$41.6 million in economic activity in Minnesota.

The input-output model used in the analysis indicated that 244 jobs were required to create the initial \$22 million in Fund spending. As a result of spending for goods and services by the funded programs, grants, and contracts and by those employed to carry-out the work, an additional 160 jobs were created. Therefore, Arts and Cultural Heritage Fund expenditures created 404 full-and part-time jobs in Minnesota. The specific industries with the highest share of those jobs included: educational services, arts – entertainment and recreation, and other services.

Of the \$22 million of direct spending by the Fund, \$12.2 million was in payments to value-added. Value-added includes employee compensation, self-employment income, rents, royalties, and dividends, and indirect business taxes. As a result of the initial spending of this value added, an additional \$12.1 million in value-added payments were created in Minnesota. The Arts and Cultural Heritage Fund, in conclusion, generated \$24.3 million in value-added activity in Minnesota. The specific industries with highest share of that value-added activity were: arts-entertainment and recreation, real estate and rental, and professional services.

This study was not an export based analysis of the economic dependency of Minnesota on the Fund's expenditures. Instead, this study estimates the economic activity and linkages that the Fund expenditures prompted. The breadth of the awards across all the counties of Minnesota and the diversity of the awards affecting a wide range of businesses sectors caused the spending to essentially affect all (97.6%) of the business sectors in the State.

As the projects are completed, the economic contribution may grow by attracting visitors from within and outside the state to spend in the individual communities where the projects are located. Some of these out-of-state visitors may consider relocating to communities in a State that highly values its heritage.



## ***Appendix One: Methodology***

This study was completed using economic impact analysis methodology. Economic impact analysis predicts how an initial change in the economy may affect the entire economy. In this case the change in the economy was redirecting personal consumption to tax revenues that were spent on Arts and Cultural Heritage projects. This is not a net analysis, we have not attempted to project the way the funds that became tax revenue would have been spent if they had not been paid in taxes. However, it is reasonable to expect some of those funds that were paid as taxes would have been saved and some of them would have been spent immediately outside Minnesota or on goods and services that were produced outside Minnesota therefore reducing the immediate economic effects. All of the Fund expenditures were spent and not saved and they were all spent in the first round of spending in Minnesota.

To estimate the economic effects of spending from the Fund, we used an input-output (I-O) economic model called IMPLAN which is an acronym for *IM* *P* *A* *C* *T* *P* *L* *A* *N* *N* *I* *N* *G*. It is produced by the Minnesota Implan Group, Inc. (MIG) in Stillwater, Minnesota. MIG uses over 30 publicly available data bases to determine the output in Minnesota's 408 economic sectors and the inputs that are required to produce that output, and the goods and services that are not required as inputs are the exports from the Minnesota economy. IMPLAN "follows" the products from their inception to finished stage and calculates the all the ways each product or service "ripples" through the economy until it finally consumed.

As an example, one of the projects was to renovate historic buildings in Pine River. The whole range of purchases including those for construction contractors, building materials, building inspections and all the other goods and services were considered inputs to the project. Construction workers, building supply store employees and building inspectors, when they were paid for their work, bought everything from groceries to gasoline to health care services to movie tickets and the folks who sold them those items completed another round of spending with their income. The "ripple" effect started by the initial renovation project caused thousands of other expenditures in Minnesota until ultimately the entire project was completed and spending subsided or leaked out of Minnesota. The initial change is called the "direct" effect. The sum of the ripple effects related to the direct effect for supplies to complete the projects like building materials or rental of a piece of equipment is called the "indirect" effect. The sum of ripples associated with employees and proprietors spending the income they earn completing the projects or supplying the projects on goods like food and services like health care is called the "induced" effect. The direct effect plus the indirect and induced effects are then added together to calculate the total effect.

In the IMPLAN model the ripples are relatively easy to track and the results can be studied from a number of different perspectives (e.g. output per employee, jobs affected per million dollars of sales, etc.). IMPLAN is widely used because it is so “transparent” and regularly updated.

The MNHS worked with University of Minnesota community economists to assign all the grant and contracts to the appropriate IMPLAN sectors so we could “run” the expenditures through the I-O model. Over 550 projects valued at \$21,320,290 (see footnote 2) were analyzed.

A few definitions are essential in order to properly read the results of an IMPLAN analysis. The terms and their definitions are provided below.

### Output

Output is measured in dollars and is equivalent to total sales. The output measure can include significant “double counting.” Think of corn, for example. The value of the corn is counted when it is sold to the mill, again when it is sold to the dairy farmer, again as part of the price of fluid milk, and yet again when it is sold as cheese. The value of the corn is built into the price of each of these items and then the sales of each of these items are added up to get total sales (or output).

### Employment

Employment includes full- and part-time workers and is measured in annual average jobs. IMPLAN includes total wage and salaried employees, as well as the self-employed, in employment estimates. Because employment is measured in jobs and not in dollar values, it tends to be a very stable metric.

### Labor Income

Labor income measures the value added to the product by the labor component. So, in the corn example when the corn is sold to the mill, a certain percentage of the sale goes to the farmer for his/her labor. Then when the mill sells the corn as feed to the dairy farmer, it includes some markup for its labor costs in the price. When the dairy farmer sells the milk to the cheese manufacturer, he/she includes a value for his/her labor. These individual value increments for labor can be measured, which amounts to labor income. Labor income does *not* include double counting.

### Direct Impact

Direct impact is equivalent to the initial activity in the economy. In this study, it is spending from the Minnesota Arts and Cultural Heritage fund.

### Indirect Impact

The indirect impact is the summation of changes in the local economy that occur due to **spending for inputs** (goods and services) by the industry or industries directly impacted. For instance, if employment in a manufacturing plant



increases by 100 jobs, this implies a corresponding increase in output by the plant. As the plant increases output, it must also purchase more inputs, such as electricity, steel, and equipment. As the plant increases purchases of these items, its suppliers must also increase production, and so forth. As these ripples move through the economy, they can be captured and measured. Ripples related to the purchase of goods and services are indirect impacts.

#### Induced Impact

The induced impact is the summation of changes in the local economy that occur due to **spending by labor**, which is spending by employees in the industry or industries directly impacted. For instance, if employment in a manufacturing plant increases by 100 jobs, the new employees will have more money to spend to purchase housing, buy groceries, and go out to dinner. As they spend their new income, more activity occurs in the local economy. This can be quantified and is called the induced impact.

#### Total Impact

The total impact is the summation of the direct, indirect, and induced impacts.