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OF BUSINESS AND ECONOMICS

Bureau of Business and Economic Research

Research Report

Minnesota Turf and Grounds Foundation: An Economic Impact Review

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For

Minnesota Turf and Grounds Foundation



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I. Project Description

The Minnesota Turf & Grounds Foundation (MTGF), which represents hundreds of employees, describes their labor force as hard workers “who make a significant contribution to the State of Minnesota in many different ways.” The mission of MTGF is “. . . to promote the green industries in Minnesota through support of research, education and outreach at the University of Minnesota and elsewhere.”

MTGF, a non-profit organization that was formed in 1993, is a partnership of eight turf and grounds related associations and the University of Minnesota. Allied associations include:

- *Minnesota Association of Cemeteries (MAC)*
- *Minnesota Golf Course Superintendents Association (MGCSA)*
- *The Minnesota Association of School Maintenance Supervisors (MASMS)*
- *The Minnesota Turf Association (MTA)*
- *Minnesota Park Supervisors Association (MPSA)*
- *Minnesota Society of Arboriculture (MSA)*
- *The Northern Minnesota Forage and Turf Seed Advisory Committee (NMFTSAC)*
- *The Minnesota Sports Turf Managers Association (MSTMA).*

To quantify what MTGF does, and to help tell the story of what MTGF members mean for the state, a survey was conducted by Readex Research, an independent research firm. A one-page/two-sided, self-administered questionnaire was designed jointly by MTGF and Readex Research. MTGF provided the survey sample which consisted of 1,585 MTGF members. The slide presentation is titled “2006 Minnesota Economic Impact Study: Report on Finding December 2006.” The primary purpose of this research study was to provide a quantitative measure of the economic impact MTGF members have in the state of Minnesota. Findings were presented in a report and a slide presentation based on the Readex survey.

The University of Minnesota Duluth Labovitz School Bureau of Business and Economic Research (BBER) was asked to review and comment on the survey findings. BBER was asked to compare secondary data sources to the report findings. The IMPLAN model was proposed to model selected industry sectors to estimate the direct, indirect and induced output, value added and employment impact of the MTGF members. The inputs for the IMPLAN model were to be estimated from the Readex Research report and the MTGF.

Methodology

BBER was asked to make impact assumptions based on assumptions derived from the presentation, and was also asked to reconstruct the industry sectoring as represented in the survey sample from similar industry sectoring in the economy of Minnesota at large. BBER estimated which industries in the IMPLAN model should be selected to show participation by the

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Minnesota Turf and Grounds Foundation employees. As part of the model assumptions, BBER reviewed the State NAICS sectoring, and listed the appropriate sectors for modeling the impact. BBER converted the NAICS sectors to the IMPLAN sectors in the model using the IMPLAN bridge table. BBER calculated a representative ratio for these grouped industries using the group and State totals. Using the resulting group industry employment numbers, BBER modeled the employees' impact with the IMPLAN data and software. BBER used model deflators for the most recent data (2004) to estimate the impact in 2006 dollars.

BBER cautions that a more privileged view of the Turf and Grounds Foundation industries could greatly improve the accuracy of the model estimation. For instance, a breakout of the actual ratio of employees in each part of this MTGF group by industry sector would have been most helpful. BBER also notes that a higher survey response rate could have also improved the accuracy of the findings. Given the diverse industry sectors represented in the sample, researchers would want to make sure that the data collected is representative of the entire population. Also, given the survey's job of gaining insight into the entire group of MTGF employees, measuring impact effects on a small sample becomes difficult. The statistical analysis of the survey data could reveal significance and margin of error to help answer this criticism.

Deliverables

The UMD Labovitz School Bureau of Business and Economic Research agreed to deliver this written report covering its comments on the MTGF presentation and report.

Timeline

The BBER agreed to deliver the written report on or before June 1, 2007.

II. Impact Procedures and Input Assumptions

IMPLAN Models

There are two components to the IMPLAN system, the software and databases. The databases provide all information to create regional IMPLAN models. The software performs the calculations and provides an interface for the user to make final demand changes.

Data

IMPLAN data files use federal government data sources including:

- US Bureau of Economic Analysis Benchmark I/O Accounts of the US
- US Bureau of Economic Analysis Output Estimates
- US Bureau of Economic Analysis REIS Program
- US Bureau of Labor Statistics County Employment and Wages (CEW) Program

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- US Bureau of Labor Statistics Consumer Expenditure Survey
- US Census Bureau County Business Patterns
- US Census Bureau Decennial Census and Population Surveys
- US Census Bureau Economic Censuses and Surveys
- US Department of Agriculture Crop and Livestock Statistics

IMPLAN data files consist of the following components: employment, industry output, value added, institutional demands, national structural matrices and inter-institutional transfers.

Impacts for this model use the most recent IMPLAN data available which is for the year 2004. The impact is reported in 2006 dollars (given the data year of inputs supplied to BBER) and calculated with the built-in deflators of the modeling software.

Economic impacts are made up of direct, indirect, and induced impacts. The following cautions are suggested assumptions for accepting the impact model:

- IMPLAN input-output is a production based model.
- Local or export based purchases that represent transfers from other potential local purchases are not counted.
- The numbers (from U.S. Department of Commerce secondary data) treat both full and part time individuals as being employed.
- Assumptions need to be made concerning the nature of the local economy before impacts can be interpreted.
- The IMPLAN model was constructed for the year 2004 (most recent data available). 2006 dollars are estimated by the model.

Definitions used in this report:

Measures

- Gross Output represents the value of local production required to sustain activities.
- Employment estimates are in terms of jobs, not in terms of full-time equivalent employees. Hence, these may be temporary, part time or short term jobs.

Effects

- Direct – Initial new spending in the study area resulting from the project
- Indirect – The additional inter-industry spending from the direct impact
- Induced – The impact of additional household expenditure resulting from the direct and indirect impact.

Sector Inputs Used for Modeling Assumptions:

Based on the types of occupations that comprise the MTGF, BBER formed a list of possible industry sectors to include in the IMPLAN model.

BBER sent an e-mail to the MGTF project contact requesting a list of businesses included in the MTGF. A reply explained that vendor companies supply the turf and grounds operations with goods and services which include: fertilizer, pesticides, equipment, and other items used in the construction, renovation, and maintenance of turf and grounds areas. The reply also explained that the businesses in the MTGF are related to “green” infrastructure, tree services, lawn services, sports turf managers and installers, and sod growers.

Based on this description, possible industry sectors were reviewed and listed by NAICS code. BBER then used an IMPLAN sectoring scheme to bridge the NAICS codes to IMPLAN codes. Listed below in Table 1 are the sectors that BBER selected to include in the MGTF model, a corresponding sector description, and the IMPLAN bridged sector codes.

Table 1: Model Sectors, Sector Descriptions, and IMPLAN Bridge

NAICS Code	Sector Description	IMPLAN Code
111421	Sod farming	6
115112	Seeding	18
221310	Irrigation system operation	32
234990	Golf and Park Construction	45
314911	Seed bags	101
325314	Fertilizer mixed	158
325320	Herbicides manufacturing	159
327332	Irrigation pipe manufacturing	194
332212	Lawnmower manufacturing, nonpowered	229
332919	Lawn hose and sprinkler manufacturing	248
333111	Lawnmower manufacturing, agricultural	257
333112	Lawn and garden equipment manufacturing	258
339999	Tree manufacturing	385
421820	Lawn and Garden Wholesaling	390
444220	Lawn supply stores	404
541320	Design Services	439
561730	Lawn and Garden Services	458
713910	Golf Courses	476
811411	Lawn and garden equipment repair and maintenance	486
812220	Cemeteries	488

Source: North American Industry Classification System and IMPLAN

Sector Ratios

Using the employment figure provided by the previous MTGF study of 51,400, BBER calculated a representative ratio for this sector group from the Minnesota state employment totals. Listed below in Table 2 are the ratio calculations:

Table 2: Employment Ratios for MTGF Sectors

IMPLAN Code	MN Employees by Sector	% in MN by Sector 268,474 Total MN	% inMTGF by Sector 54,1000 Total MTGF
6	1,363	0.51%	275
18	9,971	3.71%	2,007
32	280	0.10%	54
45	5,231	1.94%	1,050
101	327	0.12%	65
158	84	0.03%	16
159	43	0.01%	5
194	546	0.20%	108
229	1,103	0.41%	222
248	1,550	0.58%	314
257	2,645	0.99%	536
258	2,131	0.79%	427
390	135,030	50.30%	27,212
404	26,242	9.80%	5,302
439	28,540	10.63%	5,751
458	35,781	13.33%	7,212
476	11,407	4.25%	2,299
486	3,136	1.17%	633
488	3,064	1.14%	617

Source: North American Industry Classification System, IMPLAN, BBER

Based on the possible employment ratios calculated above, we modeled an impact using IMPLAN.

III. Results

Table 3a shows the IMPLAN estimation of employment impacts MTGF has on the Minnesota economy. The direct employment of 51,406 represents the total number of people employed as a direct result of the MTGF. The indirect employment of 3,016 employees represents the additional inter-industry employment resulting from the direct employment of the MTGF. The induced employment of 2,118 represents the additional employees resulting from the direct and indirect employment effects, often expressed as the impact of additional household expenditure.

Table 3a: Employment Impact by Sector

	Direct	Indirect	Induced	Total
Wholesale trade	27,212	1,184	980	29,376
Services to buildings and dwellings	7,212	917	348	8,477
Architectural and engineering services	5,751	550	74	6,376
Building material and garden supply stores	5,302	128	384	5,814
Fitness and recreational sports centers	2,299	87	159	2,545
Agriculture and forestry support activities	2,007	29	33	2,069
Other maintenance and repair construction	1,050	43	31	1,124
Household goods repair and maintenance	633	36	39	708
Death care services	617	0	57	674
Farm machinery and equipment manufacturing	536	5	1	542
Lawn and garden equipment manufacturing	427	2	1	431
Metal valve manufacturing	314	4	0	318
Greenhouse and nursery production	276	24	5	305
Hand and edge tool manufacturing	222	2	1	225
Concrete pipe manufacturing	108	0	0	108
Textile bag and canvas mills	65	0	0	65
Water- sewage and other systems	54	2	4	60
Fertilizer- mixing only- manufacturing	16	1	0	17
Pesticide and other agricultural chemical manufacturing	5	0	0	6
Total	54,106	3,016	2,118	59,240

Source: IMPLAN

Table 3b shows the output impacts that the MTGF has on the Minnesota economy. The direct output of \$7.6 billion represents the level of output produced as a direct result of the MTGF. The indirect output of \$365 million represents the additional inter-industry output produced as result of the MTGF direct output. The induced output of \$267 million represents the additional output produced as a result of direct and indirect outputs.

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Table 3b: Output Impact by Sector

	Direct	Indirect	Induced	Total
Wholesale trade	\$5,140,482,048	\$223,741,232	\$185,088,736	\$5,549,312,000
Architectural and engineering services	632,678,912	60,546,460	8,154,873	701,380,288
Building material, garden supply stores	476,310,144	11,473,198	34,501,748	522,285,120
Services to buildings and dwellings	367,555,328	46,717,736	17,741,422	432,014,496
Farm machinery and equipment mfg	190,098,112	1,767,545	290,679	192,156,320
Lawn and garden equipment mfg	186,054,512	983,857	610,997	187,649,360
Household goods repair and maintenance	97,804,560	5,582,683	6,072,941	109,460,192
Other maintenance, repair construction	90,931,176	3,750,868	2,644,993	97,327,040
Metal valve manufacturing	87,493,016	1,140,040	94,581	88,727,632
Fitness and recreational sports centers	76,014,072	2,883,783	5,258,322	84,156,176
Agriculture and forestry support activities	72,126,728	1,050,420	1,182,914	74,360,064
Hand and edge tool manufacturing	48,440,068	362,687	257,396	49,060,148
Death care services	43,544,076	0	4,032,666	47,576,744
Greenhouse and nursery production	41,192,532	3,581,430	743,533	45,517,496
Concrete pipe manufacturing	24,751,676	2,580	907	24,755,164
Water- sewage and other systems	12,525,465	370,381	986,817	13,882,662
Textile bag and canvas mills	7,907,513	14,958	26,370	7,948,841
Fertilizer- mixing only- manufacturing	7,416,276	594,205	71,525	8,082,007
Pesticide, other agricultural chemical mfg	7,355,019	582,189	138,620	8,075,828
Total	\$7,610,681,233	\$365,146,252	\$267,900,040	\$8,243,727,578

Source: IMPLAN

Table 4a shows a list of top 20 indirect and induced employment impacts, by sector, affected by the employees of the MTGF.

Table 4a: Employment Impact for the Top 20 Sectors

	Indirect	Induced	Total
Food services and drinking places	910	3,619	4,529
Employment services	2,330	530	2,860
Real estate	1,243	988	2,230
Offices of physicians- dentists- and other health	0	1,397	1,397
Hospitals	0	1,383	1,383
Food and beverage stores	234	893	1,127
General merchandise stores	295	808	1,103
Nursing and residential care facilities	0	1,072	1,072
Couriers and messengers	865	112	977
Nonstore retailers	389	532	921
Management of companies and enterprises	746	168	914
Social assistance- except child day care services	1	893	894
Automotive repair and maintenance- except car wash	167	654	820
Motor vehicle and parts dealers	151	646	797
Civic- social- professional and similar organization	184	542	726
Private households	0	704	704
Management consulting services	587	115	701
Legal services	352	340	692
Business support services	504	148	652
Accounting and bookkeeping services	476	159	636
Total	9,433	15,701	25,134

Source: IMPLAN

Table 4b shows the top 20 indirect and induced output impacts, by sector, affected by the direct output of the MTGF.

Table 4b: Output Impact for the Top 20 Sectors

	Indirect	Induced	Total
Owner-occupied dwellings	\$0	\$365,243,936	\$365,243,936
Real estate	191,623,152	152,323,712	343,946,880
Management of companies and enterprises	174,611,664	39,264,012	213,875,664
Food services and drinking places	42,571,204	169,256,832	211,828,032
Offices of physicians- dentists- and other health	0	169,154,416	169,154,416
Hospitals	0	153,320,240	153,320,240
Monetary authorities and depository credit interme	51,205,224	81,573,672	132,778,896
Telecommunications	67,254,496	42,328,676	109,583,168
Petroleum refineries	55,801,668	53,185,168	108,986,840
Insurance carriers	13,482,714	95,234,632	108,717,352
Power generation and supply	46,942,880	52,955,092	99,897,968
Nondepository credit intermediation and related a	68,372,072	30,641,648	99,013,720
Legal services	46,047,540	44,502,560	90,550,104
Management consulting services	75,425,976	14,725,699	90,151,680
Motor vehicle and parts dealers	15,787,873	67,523,008	83,310,880
Advertising and related services	60,137,232	14,204,950	74,342,184
Employment services	59,814,284	13,603,527	73,417,816
Food and beverage stores	14,300,781	54,599,148	68,899,928
Securities- commodity contracts- investments	23,045,484	44,274,388	67,319,872
Automotive repair and maintenance- except car wash	13,378,673	52,483,256	65,861,928
Total	\$1,019,802,917	\$1,710,398,572	\$2,730,201,504

Source: IMPLAN

IV. Comparisons

Table 5: Employment and Output Impact Comparisons

	Readex Research Findings	BBER Findings
Employment	54,122	54,106
Output	\$10,100,000,000	\$8,243,727,578

Source: Readex, BBER

Table 5 shows a comparison between Readex Research's and the BBER's results for the MTGF economic impact on the state of Minnesota. Employment figures differ by 16 people, which may be the result of the methodology used in estimating the BBER number. There is a substantial difference between the two output figures. Based on the numbers estimated by the IMPLAN model, BBER found an output impact roughly \$2 billion less than the findings of the Readex Research.