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Minnesota Technology, Inc

2004 Annual Report

On State Science & Technology Research & Development

FOREWORD

This report, prepared by Minnesota Technology, Inc. according to its responsibilities outlined in Minnesota Statutes 1160.71, describes scientific and technological research and development (R&D) activities sponsored by the State of Minnesota between July 1, 2003 and June 30, 2004 (FY 2004). The report includes:

- Analysis of research and development activities funded by the state during fiscal year 2004 and reported to Minnesota Technology, Inc.
- A list, organized by funding organization, of all reported R&D projects for which state dollars were allocated during fiscal year 2004.

Minnesota Technology, Inc. greatly appreciates the cooperation of state agencies, boards, commissions, authorities and institutions for providing information on their R&D activities for this report.

Analysis of research and development activities funded by the state during FY 2004 and reported to Minnesota Technology, Inc.

1. Overview of Minnesota Technology's Reporting Guidelines

Under Minnesota Statutes, state agencies and other organizations are required to notify Minnesota Technology, Inc. of any state funds allocated for science and technology research and development.

This reporting requirement applies only to dollars for which the state of Minnesota is the source; funding allocations from private sector or federal sources are excluded.

To help organizations comply with reporting requirements, Minnesota Technology has adopted specific reporting guidelines. These guidelines are described in the manual entitled *Peer Review and Reporting of State Funded Science and Technology Research and Development*, first distributed in August 1989.

Funding organizations are asked to categorize each R&D project they report into one of nine major research areas. These areas are:

- Agriculture & Food Science
- Transportation & Energy Sciences
- Natural Resources
- Environmental Protection & Waste Management
- Computers, Communications & Microelectronics
- Social Science
- Manufacturing & Engineering
- Human Health
- Physical & Natural Science

Further, because economic development and job creation are particularly important public policy goals, reporting organizations are asked to identify those R&D projects having job creation or economic development as an explicit goal.

2. Reporting Procedures

- When reporting multi-year projects, Minnesota Technology asked funding organizations to list only the amounts they actually intended to disburse in fiscal year 2004. In past years, some organizations have reported the total allocation for a multi-year project in one fiscal year, usually the year in which the project was initiated. Identifying actual per-year allocations for multi-year projects yields a truer picture of state-origin R&D expenditures in Minnesota. However, this reporting method, introduced in 1994, makes comparisons between funding levels identified in this report and those contained in reports prior to 1994 invalid.

3. Summary of R&D Expenditures in FY 2004

MTI requested R&D expenditure information from fifty state institutions and offices. Fourteen institutions and offices responded. Reporting organizations allocated a total of \$15,259,555 in grants, loans and special appropriations for scientific and technological research and development during FY 2004. In all, about 346 projects were funded by the fourteen organizations that responded. A complete list of reported projects funded in FY 2004 is presented at the end of this document.

- The dominant research category was Transportation & Energy Sciences, accounting for 56.5 percent of the total reported R&D expended. The Natural Resources category was the next largest with 19.7 percent of the funding. Table 1 provides a breakdown of the respondents R&D activities by subject category.
- The largest funding organization by far was the Minnesota Department of Transportation, which supported 116 research projects totaling \$8.3 million in funding during FY 2004. This comprised 54.4 percent of all reported funding. The University of Minnesota Graduate School was the second-largest organizational funder of R&D projects, disbursing \$2.2 million for 102 projects in all nine of the R&D categories.
- At least thirteen grants of the research and development projects reported were oriented toward economic development or job creation as a primary goal. The projects represented \$587,796.38 or 3.9% of total reported funding. Table 2 lists the projects having an economic development goal.
- 93.0 percent of all projects from reporting organizations underwent some type of peer review process prior to final selection.

Table 1.
State-Supported Science and Technology Research and Development
Amount of Funding by Research Category
Fiscal Year 2004

Research Category	Major State-Funded Sources ¹	Category Funding (All Sources)	Percent of Total R&D Funding
Transportation & Energy Sciences	<ul style="list-style-type: none"> • Minnesota Department of Transportation • University of Minnesota Graduate School • St. Cloud State University 	\$8,612,560.50	56.5
Natural Resources	<ul style="list-style-type: none"> • Minnesota Geological Survey • Minnesota Department of Natural Resources - Lands and Minerals, Forestry, and Fisheries Divisions. • Legislative Commission on Minnesota Resources • University of Minnesota Graduate School • Moorhead State University • St. Cloud State University 	\$3,009,074.49	19.7
Agriculture & Food Sciences	<ul style="list-style-type: none"> • Agricultural Utilization Research Institute • Legislative Commission on Minnesota Resources • University of Minnesota Graduate School • Minnesota Racing Commission 	\$869,876.79	5.7
Computers, Communications, and Microelectronics	<ul style="list-style-type: none"> • University of Minnesota Graduate School • St. Cloud State University • Pine Technical College • Inver Hills Community College 	\$342,791.00	2.3
Human Health	University of Minnesota Graduate School	\$902,906.00	5.9
Manufacturing Engineering	<ul style="list-style-type: none"> • University of Minnesota Graduate School • Alexandria Technical College 	\$199,963.00	1.3
Social Sciences	<ul style="list-style-type: none"> • University of Minnesota Graduate School • Moorhead State University • St. Cloud State University 	\$914,734.00	6.0
Physical and Natural Sciences	<ul style="list-style-type: none"> • University of Minnesota Graduate School • St. Cloud State University • Moorhead State University 	\$326,235.00	2.1
Environmental Protection & Waste Management	University of Minnesota Graduate School	\$81,414.00	0.5
TOTAL		\$15,259,554.78	100.0

¹ A "major source" is considered a source contributing more than 20% of the funds disbursed in a particular research category. Therefore, a source may be listed for more than one category. For each category, sources are listed in order of reported funding level.

Table 2.
R&D Projects in FY 2004
With an Economic Development or Job Creation Goal

Project Title	Recipient(s)	Funding Organization	Amount
MULTI-Specialty Bird Feed Prod	Wildlife Sciences	Agricultural Utilization Research Institute	\$4,449.38
BEEF- MN Enhanced Beef-Phase 2	G & C Packing Comp	Agricultural Utilization Research Institute	\$600.00
iTree Community Forest Cost:Benefit Research	Tree Trust, St. Paul, MN	Department of Natural Resources/Forestry	\$30,000.00
VR-Enhanced Auto Refinishing Training	Johnson Center for Virtual Reality	Pine Technical College	\$90,000.00
Small Business Development Center CY 2004	Jensen-Regnier, Dawn St. Cloud State University/St. Cloud	St. Cloud State University	\$130,800.00
GIS Specialist Position Project #04101B	Richason, Ben St. Cloud State University/St. Cloud	St. Cloud State University	\$52,448.00
Americorps Youth Works Funding	Staples, Lissa St. Cloud State University/St. Cloud	St. Cloud State University	\$50,000.00
GIS Technician Position Project #04101A	Richason, Ben St. Cloud State University/St. Cloud	St. Cloud State University	\$46,747.00
Small Business Development Center State 2004	Jensen-Regnier, Dawn St. Cloud State University/St. Cloud	St. Cloud State University	\$24,000.00
Small Business Development Center Supplement #2 CY 03	Jensen-Regnier, Dawn St. Cloud State University/St. Cloud	St. Cloud State University	\$5,000.00
MSJP Douglas Machine	Alexandria Technical College	Alexandria Technical College/DEED	\$42,259.00
MSJP Donnelly Custom Manufacturing	Alexandria Technical College	Alexandria Technical College/DEED	\$111,493.00
MSJP	Inver Hills Community College	Inver Hills Community College/DEED	\$100,000.00
TOTAL			\$587,796.38

1) Agricultural Utilization Research Institute

Summary by Research Category

FY 2004

Agriculture & Food Science \$ 520,074.79

Recipient	Project Title		FY 2004
Papa George	LAMB-Lamb Products Marketing	\$	1,591.13
MN Barley Research & Promotion	BRLY-Barley Beta Glucan Consum	\$	21,615.59
University of Minnesota	Bio-Energy Institute of Standa	\$	24,383.43
Wildlife Sciences	MULTI-Specialty Bird Feed Prod	\$	4,449.38
MNNursery & Landscape	COLLAB-Economic Impact	\$	2,612.00
Dog Food Survey	COLLAB -Dog Food	\$	1,606.50
Bixby Energy Syste	Making Biomass Energy A	\$	1,203.59
Resource Conservat	COPROD-Methane Digester Feas	\$	8,000.00
Dairyland Laborato	AG RESIDUES-Characterizing Ag.	\$	19.35
G & C Packing Comp	BEEF- MN Enhanced Beef-Phase 2	\$	600.00
North Dakot State University	Evaluation of Soybean Varietie	\$	9,400.00
BusinessWare Solut	HACCP-Food Safety Inform Piece	\$	274.77
Trades Office Prod	HACCP-Food Safety Inform Piece	\$	23.38
Federal Express Co	HACCP-Food Safety Inform Piece	\$	43.54
Mississippi Top So	COPROD-Mississippi Topsoil Exp	\$	7,539.66
MN Barley Research	BRLY-Barley Beta Glucan Consum	\$	10,505.36
Six Point Berkshire	COLLAB-Berkshire Marketing	\$	2,610.00
MN Department of Agriculture	ALF-Alfalfa New Products Initiative	\$	882.33
University of Minn	MULTI-Eval. Oils As Fuels/Turb	\$	16,364.97
The Sustainable Farming Association	On Farm Pesticide Reduction	\$	2,653.23
USDA - Budget and Fiscal Office	Bi-Based Weed Cont. Strawberry	\$	4,045.00
University of Minnesota	Honey Bee Resist	\$	5,554.78
University of Minnesota	Mgmt. Green Peach-Aphid	\$	3,746.49
University of Minnesota	Resistance of Barley Germplasm	\$	17,770.71
University of Minnesota	Imp Bio. Control & Comp Pest	\$	5,629.58
University of Minnesota	Novel Seed Treatments Veg Crop	\$	28,183.83
University of Minnesota	Int Pest Mgmt Fungus Gnats-P2	\$	4,421.25
University of Minnesota	Reduce Pesticide Use-Cabbage	\$	2,783.09
University of Minnesota	Mgmt Cottonwood Leaf Beetle	\$	7,187.13
Minnesota Canola Council	Crop Rotation Canola Disease	\$	19,095.22
University of Minnesota	Strawberry Production System	\$	11,849.52
University of Minnesota	Reduce Pesticide Use Greenhouse	\$	16,130.08
University of Minnesota	Reduce Pesticide Use-Cabbage	\$	1,519.35
University of Minnesota	Genetics/Blotch Resistance	\$	1,745.95
University of Minnesota	Control Aster Yellow	\$	17,548.37
University of Minnesota	Minnesota Hybrid Poplar Project	\$	256,486.23
	Subtotal	\$	520,074.79

2) Legislative Commission on Minnesota Resources (through the Minnesota Pollution Control Agency)

Summary by Research Category

		FY 2004
Agriculture and Food Science	\$	149,000.00
Natural Resources	\$	166,000.00

Recipient	Project Title		FY 2004
MN Department of Natural Resources	Biological Control of European Buckthorn and Spotted Knapweed	\$	100,000.00
University of Minnesota	Developing Pheromones for Use in Carp Control	\$	50,000.00
Marine-on-St. Croix Water Management Organization	Maintaining Zooplankton (Daphnia) for Water Quality: Square Lake	\$	16,000.00
University of Minnesota for research portion of this project	Native Plants and 3rd Crops for Water Quality -- U of M research component is one part	\$	149,000.00
Subtotal			\$ 315,000.00

3) Minnesota Department of Natural Resources, Division of Lands and Minerals

Summary by Research Category

		FY 2004
Natural Resources	\$	268,066.49

Recipient	Project Title		
In-house, St Paul, MN	Inland Inpit (ECR)	\$	5,784.55
In-house, St Paul, MN	Mercury/Taconite Studies	\$	32,481.48
In-house, St Paul, MN	Microencapsulation	\$	2,471.77
MnDOT, St Paul, MN	MnRoad	\$	5,000.00
UofM, Minneapolis, MN	Utilization of Hemicellulose By-products	\$	3,898.60
Cliffs Mining, Duluth, MN	Alternative Fuels for Induration Furnaces	\$	52,242.80
UofM, Minneapolis, MN	Medusa Modeling for Oxygen Injection	\$	3,969.32
UofM, Minneapolis, MN	Magnetically-enhanced Hydroseparator Study	\$	4,273.88
Northshore Mining Company,	Dust Suppression in Iron Ore Processing Plants	\$	25,507.17
UofM, Minneapolis, MN	Green Ball Porosity Measurement	\$	3,191.03
UofM, Minneapolis, MN	Green Ball Characterization	\$	185.57
UofM, Minneapolis, MN	Pellet Fines Removal System	\$	34,402.09
In-house, St Paul, MN	Inland Inpit (IOCR)	\$	3,111.54
In-house, St Paul, MN	Mercury Project	\$	26,833.67
UofM, Minneapolis, MN	Aggregate Mapping at the County Level	\$	4,044.24
UofM, Minneapolis, MN	Bedrock and Quaternary Mapping of Mesabi Range	\$	2,808.72
In-house, St Paul, MN	Aggregate Mapping at the County Level	\$	57,860.06
Subtotal			\$ 268,066.49

4) Minnesota Department of Natural Resources, Fisheries Division

Summary by Research Category

		FY 2004
Natural Resources	\$	328,668.00

Recipient	Project Title		FY 2004
Dr. M. Butler,	Testing the Efficacy of buffer/residual trees at protecting seasonal ponds	\$	2,000.00
Dr. A. Afton,	Effects of Spinning-wing Decoys on Mallards	\$	18,932.00
Dr. A. Afton,	Ecology of Lesser Scaup: Spring Condition	\$	20,000.00
Dr. D. Naugle,	A Landscape Approach to Grassland Bird Conservation in Minnesota	\$	20,000.00
Minnesota State University	Landowner and Hunter Attitudes Regarding Spring Turkey Hunter Density in Minnesota	\$	17,500.00
Dr. J. Jenks,	Faermland Deer Research	\$	49,950.00

Dr. J. Jenks,	Farmalnd Deer Research	\$	19,325.00
Dr. J. Krenz,	Turkey Research	\$	4,868.00
Dr. S. Weisburg, University of Minnesota, St. Paul, MN	Statistical Consulting	\$	7,500.00
Dr. D. Fulton,	Trends on Fisheries Issues in Minnesota	\$	22,115.00
Dr. A. Kapuscinski, University of Minnesota, St. Paul, MN	Diagnostic Genetic Markers at the Species and Subspecies Level	\$	40,000.00
Dr. I. Adelman,	Index of Biotic Integrity	\$	32,000.00
Dr. C. Schwarz,	Statistical Consulting on Mark-Recapture	\$	2,558.00
Dr. G. Sprangler,	Real Time Mortality Estimation by Acoustic	\$	28,000.00
Drs. D. Fulton and B. Vondracek	Constraints and Opportunities for Quality	\$	11,800.00
Dr. J. Bence, □Michigan State University, □Lansing, MI	Mille Lacs Consulting	\$	7,000.00
Dr. P. Welle, □Bemidji State University, □Bemidji, MN	Red Lake SocioEconomic Survey	\$	13,620.00
Dr. T Hrabik,	Development of Hydroacoustic Survey Design for MN Waters of Lake Superior	\$	11,500.00
Subtotal		\$	328,668.00

5) Minnesota Department of Natural Resources, Forestry Division

Summary by Research Category

	FY 2004
Natural Resources	\$ 327,000.00

Recipient	Project Title		FY 2004
In-house, St Paul, MN	Monitoring Land Use Change and the Implementation of the Timber Harvesting and	\$	95,000.00
Tetra Tech EM, Inc.,	Monitoring the Implementation of the Timber Harvesting and Forest Management	\$	84,500.00
Andrew David	Forest Tree Improvement	\$	10,000.00
Alan Ek	Urban and Community Forestry Program	\$	49,500.00
Land Management Information Center,	Statewide Oak Wilt Assessment	\$	40,000.00
Tree Trust,	iTree Community Forest Cost:Benefit Research	\$	30,000.00
In-house, St Paul, MN	Two-Lined Chestnut Borer Survey - Risk Assessment	\$	15,000.00
In-house, St Paul, MN	Diplodia on Jack and Red Pine - Management Guideline Development	\$	3,000.00
Subtotal		\$	327,000.00

6) Minnesota Department of Transportation

Summary by Research Category

	FY 2004
Transportation & Energy	\$ 8,328,694.50

Recipient	Project Title		FY 2004
University of Minnesota	Seasonal Changes in Pavement Material Properties	\$	18,000.00
University of Minnesota	Mn/DOT Operations	\$	13,230.00
University of Minnesota	INV696: The Influence of Rural Road Quality on Vehicle Operating Costs	\$	18,937.68
University of Minnesota	Development and Testing of Methods for Estimating the Impact of Safety Improvements	\$	1,332.00
University of Minnesota	II,III)	\$	39,513.00
University of Minnesota	INV 739: Low Temperature Cracking of Asphalt Concrete Pavements	\$	210,000.00
University of Minnesota	into Public Outreach	\$	25,950.00
University of Minnesota	Attributes and Amenities of Highway Systems that are Important to Tourists	\$	115,588.00
University of Minnesota	Repair of Fatigued Steel Bridge Girders with Carbon Fiber Strips	\$	53,247.00

University of Minnesota	Performance Measurement and Evaluation and Equipment Management Training Module Development	\$	3,800.00
University of Minnesota	INV 747: Best Practices for the Design and Construction of Low Volume Roads	\$	5,000.00
University of Minnesota	Operating Costs of Automobiles and Trucks for Economic Analysis	\$	25,020.00
University of Minnesota	Agricultural Transportation Database Consortium Support and Extensions	\$	5,029.00
University of Minnesota	Use of Adhesives to Repair Out of Plane Bending at Stiffener to Web Connection	\$	130,000.00
University of Minnesota	Use of FRP Sheets to Retrofit (Strengthen) Pier Caps	\$	10,000.00
University of Minnesota	Reduce Risk Taking at Highway At-Grade Crossings with Supplemental Visual Warnings	\$	35,000.00
University of Minnesota	World Wide Web Based Pavement Condition Reporting System	\$	21,542.00
University of Minnesota	Enhanced Portable Device for Subgrade and Granular Base Characterization	\$	82,259.00
University of Minnesota	INV 759: Impact of Roughness Elements on Reducing the Shear Stress Acting on Soil Particles	\$	16,000.00
University of Minnesota	INV 757: Designing Pavement Drainage Systems	\$	22,000.00
University of Minnesota	INV 760: Reducing Crashes at Controlled Rural Intersections	\$	3,991.48
Univ. of Wisc. - Madison	Element Unit and Failure Costs and Functional Improvement Costs for Use in the Mn/DOT Pontis Bridge Management System	\$	108,202.00
University of Minnesota	Inoculated Legumes and Revegetation/Roadside Plantings	\$	2,252.00
University of Minnesota	Sensor Based Ramp Monitoring	\$	28,125.00
University of Minnesota	INV 700: : Field Investigation of an Integral Abutment Bridge - Phase II	\$	65,999.00
University of Minnesota	INV 772: Design and Construction of Pavement Embankments in Minnesota	\$	79,219.00
University of Minnesota	INV 777: Transportation Finance Reform	\$	169,226.00
University of Minnesota	INV 776: Improve the Design of Roadside Ditches to decrease Transportation-Related Surface Water Pollution	\$	32,770.00
Iowa State University	INV 769: Cost Comparison of Treatments Used to Maintain or Upgrade Aggregate Roads	\$	35,000.00
University of Minnesota	INV 774: Driver Assistive Systems for Rural Applications: A Path to Deployment	\$	119,360.00
University of Minnesota	INV 668: 2001 Minnesota Technology Transfer (T2)/LTAP Program	\$	5,574.00
University of Minnesota	Northstar Workshop "Connecting the Minnesota Safety Agenda"	\$	50,000.00
Castle Rock Consultants Inc	Local Road Research Board (LRRB) Web Site Enhancements	\$	9,904.00
University of Minnesota	Measuring the Impact of Transportation System Decisions	\$	27,500.00
University of Minnesota	Deer Avoidance Research: Use of Motion Detector Flashing Light	\$	40,006.00
University of Minnesota	APA Rut Testing Evaluation	\$	5,519.00
University of Minnesota	INV 779: Evaluation of Asphalt Binders Used for Emulsions	\$	26,987.00
University of Minnesota	GPS-Based Real-Time Identification of Tire-Road Friction Coefficient	\$	13,000.00
University of Minnesota	Laboratory Measurements of Storm-Water Quality Improvement in Detention Ponds	\$	2,104.00
University of Minnesota	Real-Time Collision Warning and Avoidance at Intersections	\$	16,250.00
University of Iowa	INV 778: How to More Safely Accommodate Pedestrians through an Intersection with Free Flow Legs	\$	71,357.00
University of Minnesota	Telecommunications and Sustainable Transportation	\$	265,625.00
University of Minnesota	Minnesota Guidestar Support FY2002-2003	\$	329,844.00
University of Minnesota	Economic Benefits of Bicycling in Minnesota	\$	15,000.00
University of Minnesota	Development of Policy Analysis Tool for Quantifying and Characterizing Biodiesel Consumption in Minnesota by Season	\$	8,400.00
University of Minnesota	Design and Safety Implications for ATIS Use with Cell Phones	\$	120,000.00
University of Minnesota	Quality of Service Implementation for Transmission of Video Data - Phase 2	\$	20,625.00
University of Minnesota	Deployment of a Tracking-Based Monitoring System for Traffic Safety and Operation Analysis at Intersections	\$	90,000.00
U of M - Duluth	Section Travel -Time Measurement and Vehicle Classification Using Inductance Signatures of Loop Detectors	\$	51,000.00

SRF Consulting Group, Inc	INV 789: Traffic Calming - Implementation Procedures and Tools	\$	35,000.00
University of Minnesota	Fatigue-resistant Design Details for Overhead Signs, Mast-arm Sign Poles, and Lighting Standards	\$	110,000.00
University of Minnesota	Development of Pedo-transfer Functions	\$	54,000.00
University of Minnesota	Validation of Superpave Fine Aggregate Angularity (FAA) Values	\$	19,538.00
University of Minnesota	Stability Tests of Prestressed Concrete Through-Girder Pedestrian Bridge under Lateral Impact - Phase II	\$	50,000.00
University of Minnesota	Scoping Study for the Development of Design Guidelines for Bioengineering in the Upper Midwest	\$	10,043.00
University of Minnesota	User Perspectives on Location Efficient Mortgages (LEMS) and Car Sharing: Implications for Transportation, Smart Growth	\$	4,800.00
University of Minnesota	INV 668: 2002 Minnesota Technology Transfer (T2)/LTAP Program	\$	364,000.00
University of Minnesota	Safety Effects of Left Turn Phasing Schemes at High-Speed Intersections	\$	65,000.00
Darlene Gorrill	INV 999: Outreach /Communication Activities	\$	22,715.00
Ed Knoyle	Pavement Management System & Transportation Information System Support	\$	16,760.00
University of Minnesota	Minnesota Guidestar Support - 2003	\$	637,500.00
County of Dakota	INV 790: Online Monitoring and Management of Summer/Winter Maintenance Programs	\$	25,000.00
University of Minnesota	INV 998: Operational Research Program for Local Transportation Groups	\$	17,722.00
University of Minnesota	INV 792: Pavement Research Institute	\$	120,000.00
University of Minnesota	INV 795: Screening Tool for Using Waste Materials in Paving Projects	\$	44,000.00
Iowa State University	INV 796: Effectiveness of All Red Clearance Time on Intersection Accidents and Violation Trends	\$	23,616.00
Univ. of Wisc. - Madison	INV 786: Volume Threshold for Installing Bridge Approach Guardrail	\$	20,000.00
University of Minnesota	INV 798: Preliminary Laboratory Investigation of a Commercial Enzyme Solution as a Soil Stabilizer	\$	44,247.00
SRF Consulting Group, Inc	INV 645: Implementation of Research Findings	\$	87,484.00
University of Minnesota	IMP 2003-02 Production of Beneficial Mycorrhizal Inoculum	\$	12,500.00
Purdue University	IMP 2003-09 Guidelines for Superpave Level One Mix Design at the Local Government Level	\$	12,499.00
Univ. of Wisc. - Madison	INV 791: Safety & Operational Characteristics of Two-Way Left Turn Lanes	\$	25,798.00
University of Minnesota	INV 797: Urbanization of MN's Countryside: 2000-2025 - Future Geographics & Trans. Impacts	\$	50,000.00
University of Minnesota	INV 799: Impact of Alternative Storm Water Management Approaches on Highway Infrastructure	\$	36,340.00
University of Minnesota	INV 800: Cost Effectiveness Analysis of Storm Water Runoff Best Management Practices	\$	46,000.00
University of Minnesota	INV 801: Adaptation of Mechanistic - Empirical 2003 Guide for Design of MN Low - Volume PCC	\$	43,662.00
MSU	INV 802: Perf. Of Pvmt. Crack Sealants Beneath Bituminous Overlays	\$	17,000.00
University of Minnesota	INV 803: Determ. of Optimum Time for Applic. of Surface Treatment to Asphalt Concrete	\$	22,720.00
University of Minnesota	INV 804: Determ. Of Low -Temp. Fracture Toughness & Fracture Energy of Plain & Polymer Modified Asphalt Mixtures	\$	36,548.00
Iowa State University	INV 805: Safety Impacts of Street Lighting at Isolated Rural Intersections - Phase II	\$	17,060.00
University of Minnesota	INV 806: Snow & Ice Maint Operation Field Guide & Accompanying Training Course	\$	13,520.00
University of Minnesota	INV 668: 2003 Minnesota Technology Transfer (T2) LTAP Program	\$	370,000.00
University of Minnesota	Feasibility of River Barges for Transportation of Intermodal Containers to and from Minnesota	\$	40,416.00
University of Minnesota	Capacity expansion in the Twin Cities: The roads-transit balance	\$	20,000.00

University of Minnesota	Adequacy of Future Road Funding	\$	66,825.00
University of Minnesota	Real Impact of Transportation Facilities Expansion on Adjoining Property Valuation	\$	12,048.00
University of Minnesota	Pavement Design using Unsaturated Soil Technology	\$	90,000.00
University of Minnesota	Self Compacting Concrete (SCC) for Prestressed Bridge Girders	\$	58,000.00
University of Minnesota	The Value of Traveler Information for Motorists	\$	72,205.00
University of Minnesota	Streamlining of the Traffic Modeling Process for Implementation in the Twin Cities Freeway Network - Phase IIa	\$	156,000.00
University of Minnesota	Evaluation and Improvement of the Stratified Ramp Metering algorithm through microscopic simulation - Phase IIb	\$	149,526.00
University of Minnesota	Tools for predicting usage and benefits of urban bicycle network improvements	\$	9,130.00
University of Minnesota	Water Quality Performance of Dry Detention Ponds with Underdrains	\$	45,000.00
University of Minnesota	Chemical Inventory and Database Development for Recycled Material Substitutes	\$	14,000.00
University of Minnesota	Biological Control of Canada Thistle in Wetland Prairie Restoration	\$	37,100.00
University of Minnesota	INV 645 (2003-2005) (RIC Task 10): Truck Weight Compliance Education Program	\$	200,000.00
University of Minnesota	CTS 2004-2005 Operations	\$	800,000.00
University of Minnesota	Mn/ROAD Governance Structure	\$	29,997.00
Castle Rock Consultants Inc	LRRB-ORS Web Site Maintenance	\$	9,228.00
University of Minnesota	Developing ITS to Serve Diverse Populations	\$	714,650.00
University of Minnesota	2004-2005 Minnesota Airport Technical Assistance Program (AirTAP)	\$	58,338.00
University of Minnesota	Project Closeouts	\$	4,968.00
University of Minnesota	INV 807: Implementation and Closeout of FY02-03 Research Projects	\$	25,000.00
Univ. of Wisc. - Madison	INV 810: Demonstration of Ash Utilization in Low Volume Roads	\$	63,715.00
University of Minnesota	INV 815: Calibration of the 2002 AASHTO Pavement Design Guide for MN PCC/HMA Pavements	\$	63,300.00
University of Minnesota	INV 816: Low Temperature Cracking of Flexible Pavement Due to Thermal Fatigue and Combined Effects Temp/Load	\$	95,000.00
University of Minnesota	Research Publication and Outreach Services (2004-2006)	\$	26,360.00
University of Minnesota	Towards Zero Deaths (TZD) Program Administration and Outreach	\$	3,260.34
University of Minnesota	Quick-Edge: Rapid Underbody Plow Cutting Edge Changing System	\$	2,032.00
University of Minnesota	Delivery of Environmental Stewardship and Streamlining Workshop	\$	15,969.00
University of Minnesota	Transportation and Regional Growth Study Information Dissemination Project	\$	14,000.00
University of Minnesota	Rapid Assessment and Decision Making Strategies for Distortional Fatigue Multi-Girder Steel Bridges - Phase 4	\$	47,000.00
University of Minnesota	Management Practices for Weed Control in Roadway Ditches	\$	41,265.00
Iowa State University	Trucks and Twin Cities Traffic Management	\$	79,689.00
University of Minnesota	Implications for transportation policy of recent large increases in commute durations	\$	38,687.00
University of Minnesota	Enhanced Coordination of Cadastral Information :Opportunities to improve Mn/DOT and local government collaboration	\$	31,627.00
University of Minnesota	Context Sensitive Design	\$	55,000.00
		Subtotal	\$ 8,328,694.50

7) Minnesota Geological Survey

Summary by Research Category

Natural Resources FY 2004
\$ 1,596,108.00

Recipient	Project Title		FY 2004
MGS	State Special Appropriation to MGS-many projects	\$	1,029,433.00
MGS from DNR	County Geologic Atlas Program	\$	200,000.00
MGS match of USGS	USGS Statemap Cost Share	\$	125,986.00
MGS from MPCA	Karst 319	\$	13,000.00

MGS from LCMR	Mesabi Iron Range Maps	\$	65,000.00
MGS from DNR MCC	MCC Aggregate Mapping, Mesabi bedrock	\$	107,323.00
MGS from Met Council	Geol. Invest of NW metro area	\$	43,330.00
MGS from Health and MPCA	Jordan sandstone mapping	\$	12,036.00
	Subtotal	\$	1,596,108.00

8) University of Minnesota--Graduate School

Summary by Research Category

	FY 2004
Agriculture and Food Science	\$ 139,365.00
Natural Resources	\$ 85,288.00
Computers, Communications & Microelectronics	\$ 95,612.00
Human Health	\$ 902,906.00
Manufacturing Engineering	\$ 46,211.00
Environmental Protection & Waste Management	\$ 81,414.00
Transportation & Energy	\$ 26,348.00
Social Science	\$ 511,978.00
Physical & Natural Science	\$ 310,685.00

Recipient	Project Title	FY 2004
Rutkowski, Gregory E, Duluth MN	Enhanced mass transfer in a tissue-based bioreactor using vasculogenic mimicry	\$ 19,720.00
Rumbley, Jon N, Duluth MN	Elucidation of the folding pathway of cytochrome c using protein engineering	\$ 27,500.00
Pedersen, Theodore D, Duluth MN	Developing Measures of Semantic Similarity for Biomedical Text Processing	\$ 20,739.00
Stachowicz, Marian S, Duluth MN	Heart Sound Analysis Collaboration	\$ 24,961.00
Swenson, John B, Duluth MN	Experimental study of climatic and tectonic controls on sand-dominated clinoforms	\$ 19,329.00
Gallup, Christina D, Duluth MN	The timing and amplitude of sea level change based on uranium-series dating of fossil corals from Barbados, West Indies	\$ 29,077.00
Roos, Anna Marie, Duluth MN	Salt of the Earth: Volatile Salts, Medicine, and Natural Phenomena in Early Modern England	\$ 8,675.00
Qi, Yongcheng, Duluth MN	Multiple Comparison Techniques for Microarray Analysis	\$ 17,337.00
Froberg, M. Kent, Duluth MN	Establishment of a TIE2/MCP-1 Transgenic Mouse Model.	\$ 24,840.00
Trachte, George J, Duluth MN	Purchase of a Confocal Microscope for the Duluth Campus	\$ 21,250.00
Habig, Alec T, Duluth MN	Neutrino Studies with the Super-Kamiokande Experiment	\$ 21,285.00
Sharp, Geoffrey P, Duluth, MN	Outlaw Diplomacy	\$ 7,335.00
Luong, Alexandra, Duluth, MN	Emotional labor: Individual moderators and effects on employee daily well-being	\$ 13,068.00
Ropp, Jennifer A., Morris, MN	Determination of Rotational Correlation Times in Water/Salt Mixtures	\$ 5,243.00
Keeler, Matthew L, Morris, MN	Classical Dynamics of Highly Excited Alkali Atoms in Fields	\$ 22,062.00
James, Ashley J, Twin Cities MN	Surfactant Effects in Faraday Wave Evolution with Droplet Ejection	\$ 18,357.00
Pierce, Jennifer LTwin Cities MN	Racing for Innocence: Whiteness, American Culture and the Backlash Against Affirmative Action	\$ 18,537.00
Matsuo, Hiroshi, Twin Cities MN	Revealing structural bases of KSHV latency control	\$ 25,837.00
Huang, Chiung-Yu, Twin Cities MN	Joint Analysis of Recurrent Events and Failure Times	\$ 18,357.00
McClurg, Richard B, Twin Cities MN	Simulation of Bubble Nucleation and Growth in Polymeric Foams	\$ 23,761.00
Hoye, Thomas R, Twin Cities MN	Walk-up/Benchtop Electrospray Mass Spectrometer for Support of Organic Synthesis	\$ 22,500.00
McNeill, Kristopher P, Twin Cities MN	Ultra-sensitive Chemiluminescent Probes for Singlet Oxygen	\$ 23,961.00
Blank, David A, Twin Cities MN	Ultrafast electron-phonon coupling dynamics in semiconductor nanocrystal	\$ 20,961.00
Thomas, Kathleen M., Twin Cities MN	Development of Implicit Learning Mechanisms in Preschoolers	\$ 21,817.00
Detournay, Emmanuel M, Twin Cities MN	Nonlinear Dynamical System Model of Deep Drilling for Natural Resources	\$ 20,961.00
LaPara, Timothy M, Twin Cities MN	Anaerobic treatment of low-strength wastewater in membrane-coupled bioreactors	\$ 18,357.00
Nelson, Peggy B, Twin Cities MN	Children's Use of Perceptual Cues for Hearing and Understanding	\$ 18,875.00
Kim, Yongdae, Twin Cities MN	Secure Admission Control in Peer Groups on the Internet	\$ 18,357.00

Liu, Catherine, Twin Cities MN	Secularization and its Discontents: For a Critical Genealogy of the New Age	\$	26,806.00
Bigelow, Martha H, Twin Cities MN	The Role of Prior Literacy on the Acquisition of Second Language Oral Skills	\$	19,639.00
Lee, Seung-Eun, Twin Cities MN	E-tailing: Consumers' Intention to Purchase from Artisans in Developing Countries	\$	16,565.00
Cavender-Bares, Jeannine M, Twin Cities MN	Genetic structure and local adaptation to climate in live oak populations across a latitudinal gradient	\$	23,561.00
Goh, Michael P, Twin Cities MN	A Meta-Analysis of Attitudes Toward Seeking Professional Psychological Help	\$	18,628.00
Rapp, David N., Twin Cities MN	Reader Preferences and Narrative Inferences	\$	19,886.00
McMaster, Kristen L, Twin Cities MN	Promoting Reading Achievement in English Language Learners Through Peer Tutoring	\$	22,160.00
Tracy, Timothy S, Twin Cities MN	Digital Dual Wavelength Spectrophotometer	\$	19,200.00
Bland, Carole J., Twin Cities MN	Paradigm Shift in Faculty Appmnts: Its Impact on Productivity & Commitment	\$	20,961.00
Blair, Robert B., Twin Cities MN	Development and testing of an index of biotic integrity on urban gradients across two ecoregions	\$	22,409.00
Ranum, Laura P, Twin Cities MN	Leica AS Laser Microdissection System	\$	21,250.00
Ekker, Stephen C, Twin Cities MN	Time-lapse and Real-time Confocal Imaging Station	\$	30,000.00
Miller, Jeffrey R, Twin Cities MN	Role of the APC Tumor Suppressor Protein in Midbody Formation and Cytokinesis	\$	21,107.00
Somia, Nikunj V, Twin Cities MN	Characterization of a modulator of HIV-1 infection: MHI-1	\$	21,107.00
Koepp, Deanna M, Twin Cities MN	Substrate recognition by SCF ubiquitin ligases via differential localization	\$	25,324.00
Ziegler, Susy S, Twin Cities MN	Vegetation Dynamics and Climate Change in the Big Woods and Oak Savanna of Minnesota	\$	22,000.00
Harvey, Francis J, Twin Cities MN	Transformation and Geographic Information Technology: The Case of Poland	\$	9,425.00
Shuman, Bryan N, Twin Cities MN	Effects of fire and climate on the vegetation history of the Big Woods	\$	35,453.00
Kohlstedt, David L, Twin Cities MN	Acquisition of an Ion Mill for High-Resolution TEM Sample Preparation	\$	30,317.00
Isett, Christopher M, Twin Cities MN	Imperialism, capitalism, and the agrarian transformation of Manchuria in the twentieth century	\$	26,637.00
Welke, Barbara Y, Twin Cities MN	A Consuming Passion: Product Liability and the Rights Revolution in 20th Century America	\$	24,930.00
Chang, David A, Twin Cities MN	The Color of the Land: Race, Class, Tribe and Nation in Eastern Oklahoma, 1860-1930	\$	26,709.00
Deutsch, Tracey A, Twin Cities MN	Making Change: Supermarkets and the Transformation of Consumer Society, 1919-1968	\$	20,961.00
Giles-Vernick, Tamara L, Twin Cities MN	Of Birds, Bugs, and Fevers: Malaria, Environment, and Public Health in French Soudan (Colonial Mali), 1900-1960	\$	35,039.00
Dong, Zigang, Twin Cities MN	Odyssey Infrared Imaging System	\$	25,000.00
Krizek, Kevin J, Twin Cities MN	Operationalizing Preferences for Land Use-Transportation Planning and Modeling	\$	26,348.00
Brazeal, Donald K, Twin Cities MN	When E-mail Wasn't E-mail: Social Construction of First-Circuit Technology Decisions for E-mail	\$	19,817.00
Schwitzer, Gary J, Twin Cities MN	Health policy news on local television: an assessment and a demonstration project	\$	25,300.00
Huh, Jisu, Twin Cities MN	Perceived Effects of Direct-to-Consumer Prescription Drug Advertising Among Physicians and Its Behavioral Influence: Applying the Third-Person Effect Framework	\$	18,251.00
Gleason, William B, Twin Cities MN	Parallel Computing at the Bench: A Laboratory-Scale Linux	\$	26,342.00
Skubitz, Amy P, Twin Cities MN	Metastatic Potential of Ovarian Carcinoma Spheroids	\$	29,039.00
Kelekar, Ameeta, Twin Cities MN	Control of Caspase-9 activity by cleavage site phosphorylation	\$	21,567.00
Farrar, Michael A, Twin Cities MN	Real-Time PCR Thermal Cycler	\$	13,774.00
Zellmer-Bruhn, Mary E, Twin Cities MN	Attention to Time and Team Task Progress	\$	10,936.00
Schnatterly, Karen A, Twin Cities MN	Boards of directors, performance and crime: the U.S. semiconductor industry	\$	19,482.00
Lau-Gesk, Loraine G, Twin Cities MN	Indifference or Ambivalence: Understanding the Role of Biculturalism in Consumer Decision Making	\$	14,324.00
Kortshagen, Uwe R, Twin Cities MN	Atmospheric Pressure Plasma for "Green" Decontamination and Sterilization	\$	22,450.00
Ferguson, David M, Twin Cities MN	Discovery and development of novel non-nucleoside HIV and HSV antivirals	\$	33,972.00
Xing, Chengguo, Twin Cities MN	Developing member-specific Bcl-2 small-molecule modulators	\$	20,961.00
Peterson, Erik J, Twin Cities MN	Structure/function analysis of the role of ADAP in thymocyte development	\$	23,639.00
Redmon, James B, Twin Cities MN	Determinants of fertility in men from the Study for Future Families	\$	11,703.00

Gupta, Kalpna G, Twin Cities MN	Opioid Analgesics Promote Metastatic Bone Disease	\$	21,250.00
Sibley, Shalamar D, Twin Cities MN	Intraabdominal Fat, Renin-angiotensin Abnormalities, and Albumin Excretion	\$	23,579.00
Armstrong, Sandra K., Twin Cities MN	Iron acquisition in Bordetella pertussis	\$	21,547.00
Bohjanen, Paul R, Twin Cities MN	Effect of HIV infection on T cell gene expression and mRNA decay	\$	22,500.00
Koyano-Nakagawa, Naoko, Twin Cities MN	Functional Characterization of the MTG family proteins in neuronal differentiation	\$	24,223.00
O'Boyle, Carol, Twin Cities MN	Variables that Influence the Response of Nurses During a Bioterrorism Event	\$	20,063.00
Kubik, Martha Y, Twin Cities MN	Physical Activity in Low-income Female Youth Attending a Community-based Health Clinic	\$	26,405.00
Zunkel, Gretchen M, Twin Cities MN	Tool development to measure dyadic coping processes following breast cancer diagnosis	\$	11,259.00
Looman, Wendy S, Twin Cities MN	Validation of the Social Capital Scale for Families of Children with Chronic Conditions	\$	14,226.00
Huang, Andrew J, Twin Cities MN	Molecular Therapy for Myocilin-Related Glaucoma	\$	14,875.00
Cain, David M, Twin Cities MN	Effect of ATP on primary afferent nociceptors innervating mouse skin with tumor	\$	17,459.00
Gopalakrishnan, Rajaram, Twin Cities MN	Parathyroid Hormone (PTH) Regulation of Matrix Gla Protein (MGP) in Osteoblasts	\$	22,876.00
Whitley, Chester B, Twin Cities MN	Examination of Artificial Lentiviral Vector Gene Transfer	\$	21,587.00
Elmqvist, William F, Twin Cities MN	Quantitative Real-Time PCR Thermal Cycler	\$	15,095.00
Grant, David J, Twin Cities MN	Raman Spectrometer for Characterizing Solid Materials	\$	35,000.00
Wiedmann, Timothy S, Twin Cities MN	Crystallization Process in Gallstones	\$	11,957.00
Di Fabio, Richard P, Twin Cities MN	Multi-User Force-Motion Analysis System for Human Movement Studies	\$	20,000.00
Goldman, Allen M, Twin Cities MN	Fluctuating Superconducting Order in High Temperature Superconductors	\$	24,789.00
Gherghetta, Tony, Twin Cities MN	Supersymmetry and Extra Dimensions	\$	23,533.00
Lefebvre, Paul A, Twin Cities MN	High Resolution Digital Acquisition System for Microscopy	\$	17,325.00
Ni, Min, Twin Cities MN	Molecular cloning of light signaling components RF12 and RF13	\$	24,817.00
Tiffin, Peter L, Twin Cities MN	Evolutionary stability of legume-rhizobia mutualisms	\$	20,961.00
Weinig, Cynthia, Twin Cities MN	Developmental responses of flowers to heterogeneous daylengths	\$	32,000.00
Bradeen, James M., Twin Cities MN	Expanded Genomics Resources for Disease Resistant Potato Species	\$	23,619.00
Hollingsworth, Charla R, Twin Cities MN	Molecular Assays of Small Grains Infested with Aster Yellow Phytoplasma	\$	20,643.00
Miller, Joanne M, Twin Cities MN	What Motivates Political Participation?	\$	34,600.00
Vuchetich, John P, Twin Cities MN	Brain Structural and Functional Correlates of NPV in Schizophrenia	\$	7,523.00
MacDonald, Angus W, Twin Cities MN	Advanced Methods for Dissociating Cognitive Control Processes in Functional Magnetic Resonance Imaging	\$	25,038.00
Fletcher, Charles R, Twin Cities MN	A Computer Laboratory for Research on Reading Fluency	\$	11,738.00
Gewirtz, Jonathan C, Twin Cities MN	Corticotropin-releasing hormone: Role in anxiogenic effects of opiate withdrawal	\$	20,177.00
Warren, John R, Twin Cities MN	High School Exit Examinations and Post-High School Outcomes	\$	21,107.00
Collister, John P, Twin Cities MN	CNS Sites Involved in Chronic CV Responses to Nicotine	\$	18,565.00
O'Brien, Timothy D, Twin Cities MN	Use of Multipotent Adult Progenitor Cells in a Murine Diabetes Model	\$	26,265.00
Borjesson, Dori L, Twin Cities MN	Anaplasma phagocytophila Infection of Megakaryocytes	\$	27,168.00
Subtotal		\$	2,199,807.00

9) Minnesota Racing Commission

Summary by Research Category

Agriculture and Food Science FY2004
\$ 61,437.00

Recipient	Project Title		FY 2004
University of Minnesota--Clinical and Population Sciences	MN Equine Center	\$	59,337.00
University of Minnesota--Clinical and Population Sciences	Equine Neonatal Program and Colostrum Network	\$	2,100.00
Subtotal		\$	61,437.00

10) Moorhead State University

Summary by Research Category		FY2004
Natural Resources	\$	7,230.00
Social Science	\$	23,650.00
Physical and Natural Science	\$	2,750.00

Recipient	Project Title	FY 2004
Ficek Rhonda	Lead Faculty Group Tech Center	\$ 23,650.00
Davis George	Teacher Research Network of Sci Math	\$ 7,230.00
Provost Joe	Learn by Doing Bio-Chem Lab	\$ 2,750.00
Subtotal		\$ 33,630.00

11) Pine Technical College

Summary by Research Category		
Computers, Communications & Microelectronics	\$	90,000.00

Recipient	Project Title	FY 2004
Johnson Center for Virtual Reality at Pine Technical College, Pine City MN	VR-Enhanced Auto Refinishing Training	\$ 90,000.00
Subtotal		\$ 90,000.00

12) St. Cloud State University

Summary by Research Category		FY 2004
Natural Resources	\$	230,714.00
Computers, Communications & Microelectronics	\$	57,179.00
Transportation & Energy	\$	257,518.00
Social Science	\$	379,106.00
Physical & Natural Science	\$	12,800.00

Recipient	Project Title	FY 2004
Richason, Ben St. Cloud State University/St. Cloud	GIS Specialist Position Project #04101B	\$ 52,448.00
Richason, Ben St. Cloud State University/St. Cloud	GIS Technician Position Project #04101A	\$ 46,747.00
Arriagada, Jorge St. Cloud State University/St. Cloud	LCTA Long Term Monitoring Study Field Season 2004	\$ 36,036.00
Julius, Matt St. Cloud State University/St. Cloud	Water Quality Trend Analysis Program 2004	\$ 31,708.00
Arriagada, Jorge St. Cloud State University/St. Cloud	Monitoring and Controlling Invasive Plant Species	\$ 22,000.00
Schoenfuss, Heiko St. Cloud State University/St. Cloud	Assessing Estrogenic Level on Fish Reproductive Health	\$ 21,575.00
Restani, Marco and Robinson, David St. Cloud State University/St. Cloud	Long Term Monitoring of Fauna at Camp Ripley	\$ 20,200.00
McMullen-Boyer, Jo and Majid, Roya St. Cloud State University/St. Cloud	MN Block Operating Grant: Non-commercial Radio	\$ 26,083.00
Johnson, Robert St. Cloud State University/St. Cloud	Math Science Computer Camps 2003	\$ 9,074.00
Tornquist, Kristi St. Cloud State University/St. Cloud	Digital Library Project Matching Contribution	\$ 7,500.00
Bixby, Terri and Ellickson, James St. Cloud State University/St. Cloud	NHD Applications Workshop	\$ 7,010.00
Herath, Susantha and Heath, Richard St. Cloud State University/St. Cloud	Symposium on Operating Systems and Security	\$ 5,000.00
Torguson, Jeffrey St. Cloud State University/St. Cloud	HTML Training	\$ 2,512.00
Bixby, Terri and Richason, Ben St. Cloud State University/St. Cloud	MNDOT Railroad Map Georeferencing (Right of Way)	\$ 80,000.00

Richason, Ben St. Cloud State University/St. Cloud	MNDOT Base Map - 04-05	\$	50,000.00
Bixby, Terri and Richason, Ben St. Cloud State University/St. Cloud	MNDOT Right of Way Georeferencing	\$	50,000.00
Richason, Ben and Anderson, Lee St. Cloud State University/St. Cloud	MNDOT Base Map FY04 - B	\$	45,518.00
Richason, Ben and Bixby, Terri St. Cloud State University/St. Cloud	MNDOT Base Map FY04 - C	\$	32,000.00
Jensen-Regnier, Dawn St. Cloud State University/St. Cloud	Small Business Development Center CY 2004	\$	130,800.00
Gilman, Cheri and Umerski, Fran St. Cloud State University/St. Cloud	MN Early Intervention Summer Institute	\$	85,978.00
Staples, Lissa St. Cloud State University/St. Cloud	Americorp Youth Works Funding	\$	50,000.00
Wagner, Steve and Frank, Steve St. Cloud State University/St. Cloud	Statewide SCSU Survey for MN Lottery	\$	45,000.00
Jensen-Regnier, Dawn St. Cloud State University/St. Cloud	Small Business Development Center State 2004	\$	24,000.00
Wagner, Steve and Frank, Steve St. Cloud State University/St. Cloud	SCSU Survey for MN Lottery 2004 (Amendment to Extension)	\$	15,000.00
Lo, Ming Chien and Grossman, Phillip St. Cloud State University/St. Cloud	Active Learning Center for Economics Education	\$	8,680.00
Wilmesmeier, James St. Cloud State University/St. Cloud	MNADE Conference: Trends & Initiatives in Developmental Education	\$	5,129.00
Soroko, Mary and Sleeper, Brad St. Cloud State University/St. Cloud	Herberger College of Business CTL Assessment Program Grant	\$	5,000.00
Jensen-Regnier, Dawn St. Cloud State University/St. Cloud	Small Business Development Center Supplement #2 CY 03	\$	5,000.00
Wilmesmeier, James St. Cloud State University/St. Cloud	Exploring the Spectrum of College Readiness	\$	4,519.00
Sreerama, Lakshmaiah and Mahroof-Tahir, Mohammad St. Cloud State University/St. Cloud	Interdisciplinary Research Experience Science Learning	\$	12,800.00
Subtotal		\$	937,317.00

13) Alexandria Technical College

Summary by Research Category

Manufacturing Education \$ FY 2004 153,752.00

Recipient	Project Title		FY 2004
Alexandria Technical College	MSJP Douglas Machine	\$	42,259.00
Alexandria Technical College	MSJP Donnelly Custom Manufacturing	\$	111,493.00
Subtotal		\$	153,752.00

14) Inver Hills Community College

Summary by Research Category

Computers, Communications, and Microelectronics \$ FY 2004 100,000.00

Recipient	Project Title		FY 2004
Inver Hills CC	MSJP	\$	100,000.00
Subtotal		\$	100,000.00

Total (Institutions 1-14) \$ 15,259,554.78

Subtotals by Category

<u>Agriculture and Food Science</u>	\$	869,876.79
Natural Resources	\$	3,009,074.49
Computers, Communications & Microelectronics	\$	342,791.00
Human Health	\$	902,906.00
Manufacturing Engineering	\$	199,963.00
Environmental Protection & Waste Management	\$	81,414.00
Transportation & Energy	\$	8,612,560.50
Social Science	\$	914,734.00
Physical & Natural Science	\$	326,235.00
	\$	15,259,554.78
Total Check		