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Research Expenditures, Sponsored Proposals, and Awards FY 1997

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Introduction

This report provides an assessment of the University's research efforts during the past fiscal year, as reflected by three major measures: (1) research expenditures, (2) research proposals, and (3) research awards. These data reflect the rich diversity of research activities and capabilities that have earned the University of Michigan the distinction of the nation's leading public research university.

Increases in annual expenditures in support of research demonstrate the continued leadership of the University in the discovery of new knowledge and in the application of leading-edge technologies for the benefit of society. Research expenditures in FY 1997 exceeded the $458 million mark, recording a 3.9% increase over the previous fiscal year.

Research proposals submitted provide some indication of the new research opportunities being offered by prospective sponsors and reflect the responsiveness of the faculty to these program opportunities. The majority of proposals are in response to specific requests for proposals (RFP's) which, in turn, reflect the highest priority research initiatives of the sponsors. The dollar value of the 3,515 proposals submitted in FY 1997 approached $1.6 billion.

New research awards should exceed annual expenditures in order for the University to sustain its research momentum in the face of increasing costs. In FY 1997, this "margin" between awards and expenditures was $25.7 million ($434.6 million in new awards and $408.8 million in expenditures from externally funded sources). Compared to FY 1996, the dollar value of research awards recorded in FY 1997 increased by 5.9%. Many awards are made on a multi-year basis, so a portion of awards from previous years can be spent in subsequent years.

Research Expenditures

Total research expenditures at the University of Michigan have increased by 95.4 percent over the past decade, from $234.6 million in FY 1988 to $458.5 million in FY 1997, as shown in Exhibit 1. Real purchasing power of these expenditures (i.e., discounted for inflation) has also continued to increase. Over the past decade, research expenditures increased by 42.8% in constant (FY 1988) dollars. During the past fiscal year, total research expenditures increased by 3.9% in current dollars, from $441.3 million in FY 1996 to $458.5 million in FY 1997. The constant dollar increase during FY 1997 was 2.3%.

Indirect cost recoveries from externally funded research projects increased by 5.9% -- from $87.4 million in FY 1996 to $92.1 million.

Exhibit 1
Research Expenditures FY 1988 - 1997

Research expenditures from federally sponsored projects increased significantly (82%) between FY 1984 and FY 1989. These expenditures leveled off in FY 1990, however, reflecting some uncertainty among both federal agencies and faculty resulting from delays in the authorization of federal funding in this fiscal period. Renewed confidence seemed evident in the 15% increase in expenditures from federal sources during FY 1991 -- the largest increase at the University of Michigan, both in relative and absolute terms, in the past 10 years (see

Exhibit 2). Over this period, research expenditures from federal sources increased by 92.4%, from $156.1 million in FY 1988 to $300.4 million in FY 1997.

Exhibit 2
Ten-Year Trend in Research Expenditures
By Federal and Non-Federal Sources

The 5.9% increase in research expenditures from federal sources in FY 1997 represents an improvement from FY 1996 modest increase of 2.1% over FY 1995. Federal projects accounted for 65.5% of the total research expenditures at the University of Michigan in FY 1997, up from a 64.3% share in FY 1996.

Over the past 10 years, research expenditures from non-federal sources have increased by 145.7%. A slight decrease of .4% was recorded in the past fiscal year, from $108.8 million in FY 1996 to $108.4 million in FY 1997. This decrease represents a moderation of last year's experience where non-federal expenditures increased by 31.9%. Non-federal expenditures accounted for nearly 25% of the total research expenditures from external sources. Increases were recorded in support from private foundations (26.3%), public charities (11.5%), and state and local governments (1.3%). Decreases were noted in industry (-10.0%), endowment (-9.1%), and trade and professional associations (-3.4%).

Increases in expenditures from federal sources over the past several years have tended to mirror the expenditure patterns of projects funded by the National Institutes of Health (NIH). The increase in expenditures from NIH supported projects from FY 1996 to FY 1997 of 5.7%, for example, was just slightly lower than the overall increase in federal expenditures of 5.9%. NIH accounted for 56.6% of the total federal expenditures in FY 1997.

Exhibit 3
Research Expenditures By Sponsor Group
FY 1997

Expenditures from projects sponsored by the National Science Foundation increased by 14.1% in FY 1997. The growth in NIH and NSF support was partially offset by a 3.6% decrease in expenditures from projects sponsored by the Department of Defense.

University funds in support of research accounted for $49.6 million (10.8%) of the $458.5 million in total research expenditures in FY 1997. These funds have been committed to meet critical capital facilities and equipment needs in support of the research mission, as well as the increase in University cost sharing expectations on federal grants and contracts. Over the past five years, these commitments have remained fairly constant, however, as the total expenditures for research have risen.

Research Proposals

The total dollar value of research proposals submitted by the University to prospective sponsors has increased by 101.2% over the past 10 years, from $747.3 million in FY 1988 to $1.50 billion in FY 1997. The dollar value requested in FY 1997 represented a 20.0% increase over the level of $1.25 billion submitted in FY 1996. The dollar level of support requested of federal sponsors in FY 1997 grew by 17.4% to $1.24 billion, while the dollars requested of nonfederal sponsors increased by 34.6% to $259.5 million. The distribution of proposals submitted in FY 1997 is shown in Exhibit 4.

Exhibit 4
Research Proposals By Sponsor Group
FY 1997

Research Awards

The dollar value of research awards received by the University over the past 10 years has increased by 96.8%, from $220.8 million in FY 1988 to $434.6 million recorded in FY 1997. The 4.2% decrease in federal awards (to $313.2 million) in FY 1997 was offset by a 45.6% increase in award dollars from nonfederal sponsors, resulting in an overall increase of 5.9% when compared to FY 1996.

Exhibit 5
Research Awards By Sponsor Group
FY 1997

Major funding from the National Institutes of Health in support of various research centers at the University is on a five-year cycle, and in FY 1997, there were fewer new and continuing awards made by NIH to support the important research programs of these centers. As a result, the University realized a 10.0% decrease in the dollar value of awards recorded.

The $34.5 million in awards received in FY 1997 from the National Science Foundation included $13.6 million in support of the Center for Ultrafast Optical Science over five years. Unfortunately, a 5.0% decline in the number of awards received from NSF contributed to a 4.1% decline in award values.

Research Portfolio by University Unit

Several factors affect the distribution of research support among University units: availability of external support in various fields, relative cost of undertaking research activities, size of the academic unit, relative emphasis placed on research, and national competitive position. Disciplines/units with greater access to federal agencies that provide multi-year awards will account for a larger percentage of the dollar value of awards when compared to their expenditures in any given fiscal year.

Collaborative efforts across unit boundaries further complicate an accurate reflection of this distribution. Faculty who have joint appointments tend to route their proposals through only one of their units (for example, the Institute for Social Research includes a large number of faculty with joint appointments in the College of Literature, Science and the Arts).

Research expenditures in the Medical School increased by 5.1% in FY 1997, which was a major contributing factor to the overall growth in research expenditures, since the Medical School accounts for 34.6% of the University's total research expenditures.

Exhibit 6
Research Expenditures By University Unit
FY 1997

Research expenditures in the College of Engineering increased by 8.1%, from $95.5 million to $103.2 million. Expenditures in the School of Information increased by 20.6%, from $3.7 million to $4.4 million. Research expenditures increased in the School of Business Administration (18.2%), the School of Nursing (3.6%), the School of Education (17.5%), and the College of Pharmacy (18.3%). Expenditures in support of research in the College of Literature, Science and the Arts increased by 8.1%, while expenditures in the Institute for Social Research, which draws upon the participation of LS&A faculty, declined by 6.1%.

The distribution of research proposals submitted and awards recorded in FY 1997 are shown in Exhibit 7 and Exhibit 8, respectively.

Exhibit 7
Research Proposals By University Unit
FY 1997

Exhibit 8
Research Awards By University Unit
FY 1997

The dollar value of awards received by the Medical School increased by 29.0% continuing a robust increase experienced in the previousyear amounting to 32.2%. The dollar value of awards recorded by the Institute of Social Research decreased by 69.9% following last year's 83.0% growth rate; the Transportation Research Institute showed a 32.0% increase in award dollars; and the Institute of Gerontology recorded a 75.2% decline after FY 1996 record increase of 318.8%.

Research expenditures in the Medical School have increased by 101.5% in the period since FY 1988. In the College of Engineering, research expenditures have increased by 132.4% over the past ten years. Research expenditures in the College of Literature, Science, and the Arts (50.2%) and the Institute for Social Research (87.2%) have recorded significant increases during this same period. It is important to recognize that research opportunities during the decade of the 1980's have been largely centered in the fields of medicine, engineering, biotechnology, and applied science and technology.

Research Expenditures by Broad Fields of Study

The distribution of research expenditures by the six broad fields of study defined by the National Science Foundation provides another useful vantage point for understanding the University's research portfolio. These fields of study consolidate expenditures across organizational lines within the University. The field of Life Sciences, for example, includes research activities in the Medical School, the College of Literature, Science, and the Arts, the School of Public Health, the School of Nursing, the College of Pharmacy, the School of Dentistry, the College of Engineering, and various research centers and institutes. The field of Engineering includes research activities in the College of Engineering, as well as projects outside the College.

A ten-year comparison of the distribution of research expenditures among the fields of study is provided in Exhibit 9. During this ten year period, the University's research expenditures increased by 115.2%, from $213.0 million to $458.5 million, for an average increase of 11.5% per year.

Exhibit 9
Trends in Research Expenditures By Fields of Study
FY 1997

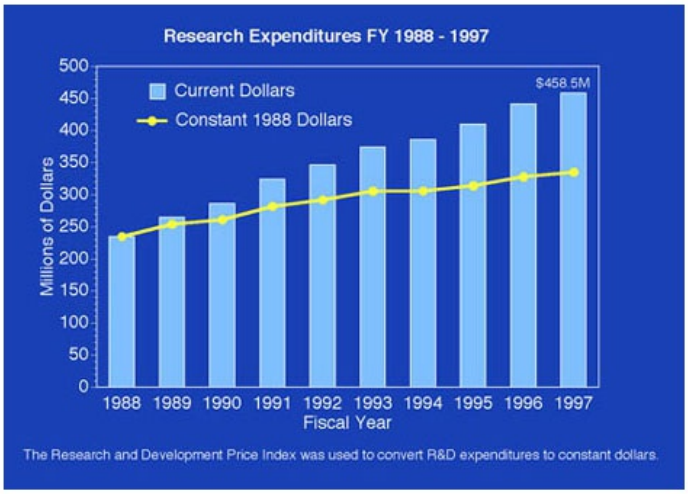
The Life Sciences continues to maintain a dominant position in terms of the University's research expenditures, recording a 113.5% increase over the past ten years and accounting for $205.7 million (44.9%) of the total expenditures in FY 1997. However, the relative share of the total research dollars spent in support of the Life Sciences has declined slightly since FY 1987, when the $96.3 million represented 45.2% of the total expenditures.

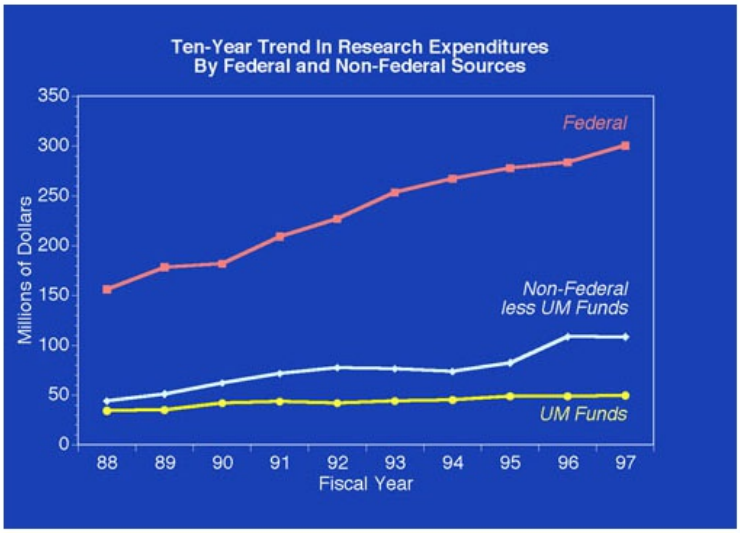
Engineering accounted for 20.8% of the total research expenditures in FY 1987 ($44.2 million). Engineering has kept pace with the overall increase in University research expenditures over the past 10 years to increase its share to 21.3% share, with $97.5 million in expenditures in FY 1997.

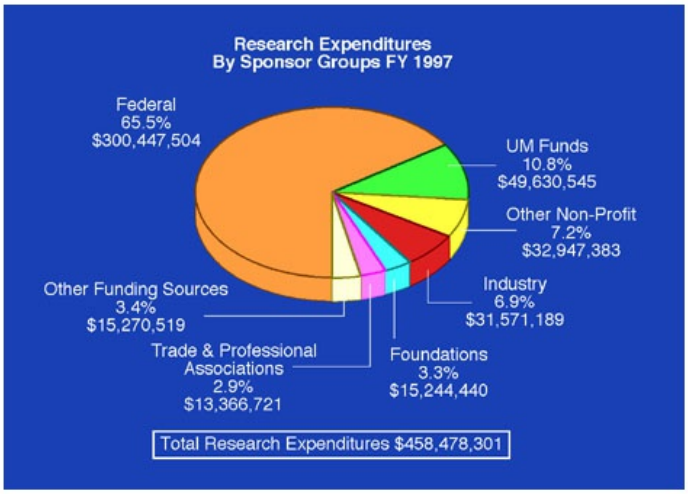
The Social Sciences continue to show a significant research capacity at the University of Michigan, accounting for 13.4% of the total research expenditures in FY 1997. The $61.2 million in expenditures represents a 168.9% increase over the $22.8 million expended in FY 1987.

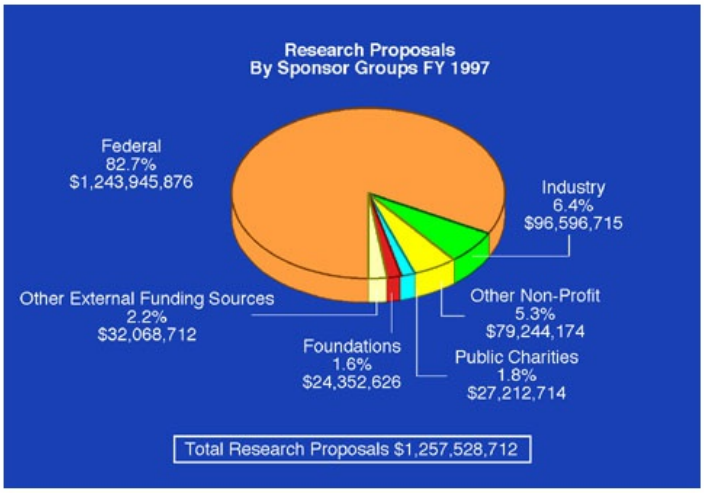
Research expenditures in the Physical Sciences recorded a 176.8% increase over the past ten years. The $46.5 million spent in FY 1997 accounted for 10.1% of the total research expenditures.

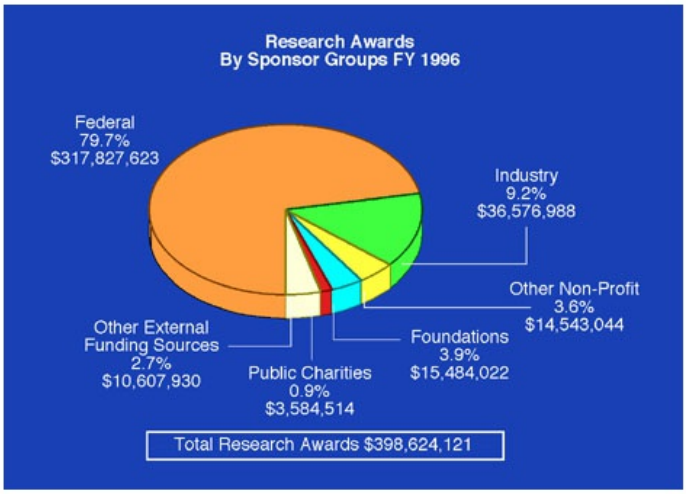
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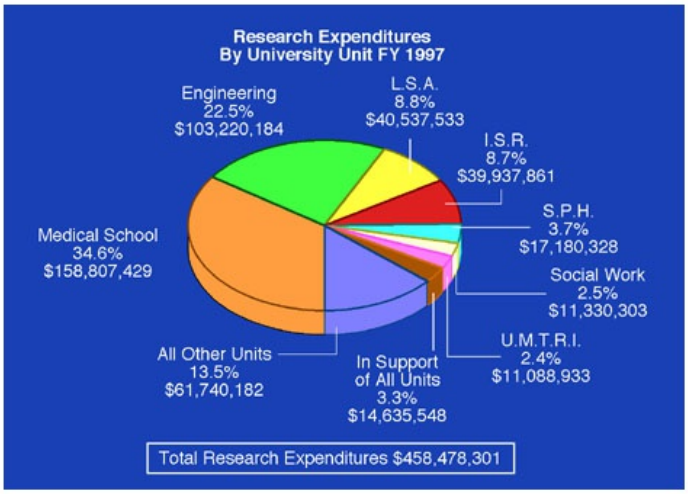

Research Expenditures FY 1988 - 1997
Current Dollars
Constant 1988 Dollars
$458.5M
Millions of Dollars
500
450
400
350
300
250
200
150
100
50
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997
Fiscal Year
The Research and Development Price Index was used to convert R&D expenditures to constant dollars.

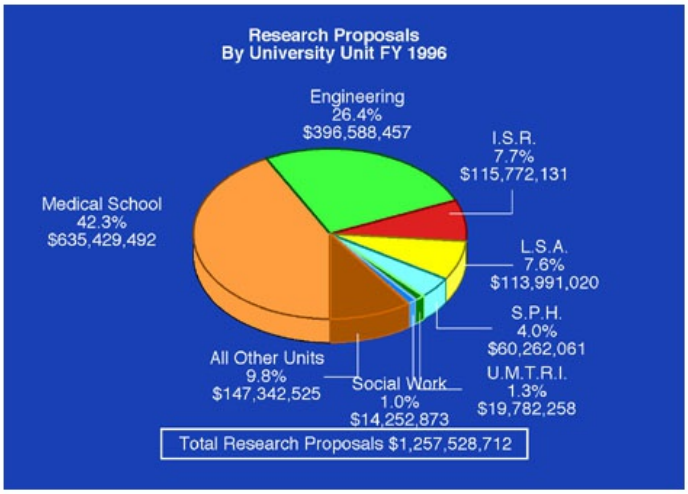

Ten-Year Trend In Research Expenditures
By Federal and Non-Federal Sources
Millions of Dollars
350
300
250
200
150
100
50
0
Federal
Non-Federal
less UM Funds
UM Funds
88
89
90
91
92
93
94
95
96
97
Fiscal Year

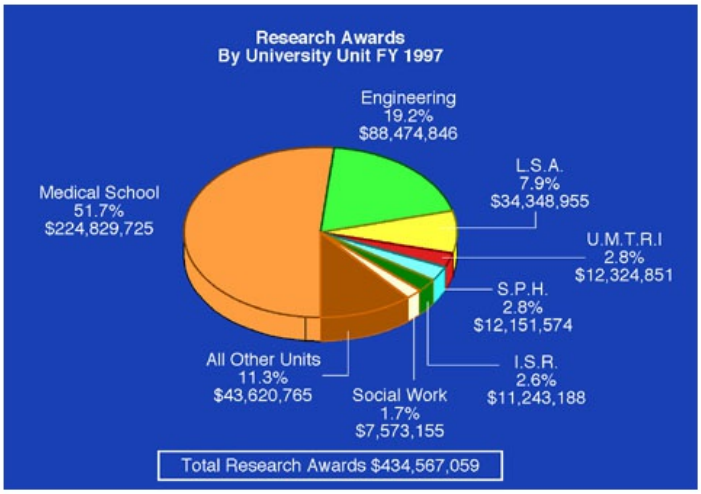

Research Expenditures
By Sponsor Groups FY 1997
Federal
65.5%
$300,447,504
UM Funds
10.8%
$49,630,545
Other Non-Profit
7.2%
$32,947,383
Industry
6.9%
$31,571,189
Foundations
3.3%
$15,244,440
Trade & Professional
Associations
2.9%
$13,366,721
Other Funding Sources
3.4%
$15,270,519
Total Research Expenditures $458,478,301

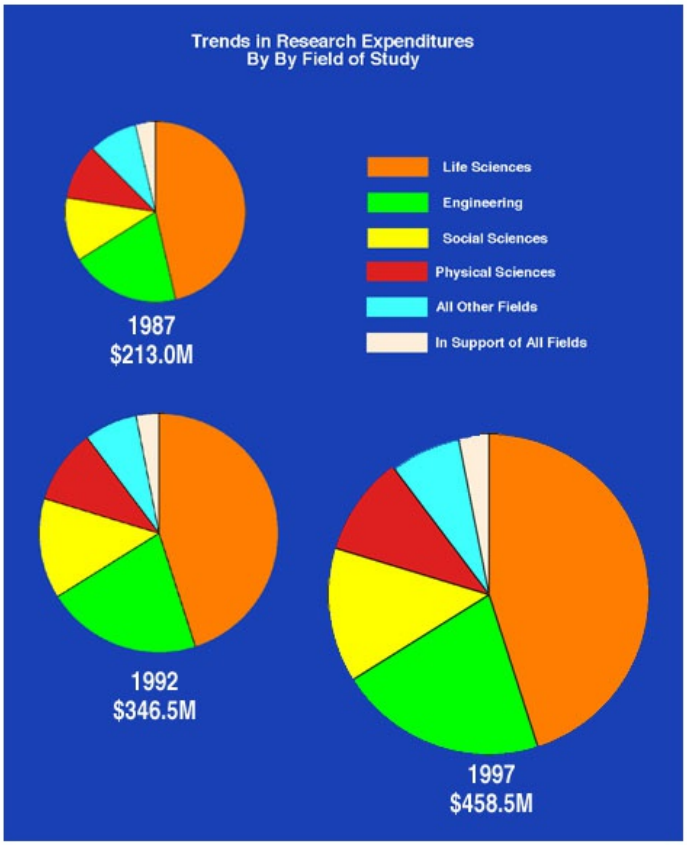

Research Proposals
By Sponsor Groups FY 1997
Federal
82.7%
$1,243,945,876
Industry
6.4%
$96,596,715
Other External Funding Sources
2.2%
$32,068,712
Other Non-Profit
5.3%
$79,244,174
Foundations
1.6%
$24,352,626
Public Charities
1.8%
$27,212,714
Total Research Proposals $1,257,528,712


Research Awards
By Sponsor Groups FY 1996
Federal
79.7%
$317,827,623
Industry
9.2%
$36,576,988
Other Non-Profit
3.6%
$14,543,044
Foundations
3.9%
$15,484,022
Public Charities
0.9%
$3,584,514
Other External
Funding Sources
2.7%
$10,607,930
Total Research Awards $398,624,121


Research Expenditures
By University Unit FY 1997
Engineering
22.5%
$103,220,184
L.S.A.
8.8%
$40,537,533
I.S.R.
8.7%
$39,937,861
S.P.H.
3.7%
$17,180,328
Social Work
2.5%
$11,330,303
U.M.T.R.I.
2.4%
$11,088,933
In Support
of All Units
3.3%
$14,635,548
All Other Units
13.5%
$61,740,182
Medical School
34.6%
$158,807,429
Total Research Expenditures $458,478,301


Research Proposals
By University Unit FY 1996
Engineering
26.4%
$396,588,457
I.S.R.
7.7%
$115,772,131
Medical School
42.3%
$635,429,492
L.S.A.
7.6%
$113,991,020
S.P.H.
4.0%
$60,262,061
All Other Units
9.8%
$147,342,525
Social Work
1.0%
$14,252,873
U.M.T.R.I.
1.3%
$19,782,258
Total Research Proposals $1,257,528,712


Research Awards
By University Unit FY 1997
Engineering
19.2%
$88,474,846
L.S.A.
7.9%
$34,348,955
U.M.T.R.I
2.8%
$12,324,851
S.P.H.
2.8%
$12,151,574
I.S.R.
2.6%
$11,243,188
Social Work
1.7%
$7,573,155
All Other Units
11.3%
$43,620,765
Medical School
51.7%
$224,829,725
Total Research Awards $434,567,059


Trends in Research Expenditures
By By Field of Study
Life Sciences
Engineering
Social Sciences
Physical Sciences
All Other Fields
In Support of All Fields
1987
$213.0M
1992
$346.5M
1997
$458.5M