

The MIT Faculty Newsletter

Vol. V No. 3

January 1993

Clean Air, Parking, and the MIT Community

Lydia S. Snover

MIT is a major educational institution that happens to be located right smack in the center of the Boston metropolitan area in the city of Cambridge. The MIT community is made up of 4,500 undergraduates, 5,200 graduate students, 8,500 faculty and staff, and various numbers of visitors. Students, faculty, and staff of the Institute are either members of the Cambridge community by virtue of their place of

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residence or must pass through the community on their way to and from the Institute. The ways in which MIT community members commute to the Institute affects how MIT uses its land resources and, to some degree, the

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MIT Finances: Where We Are and Where We're Hoping to Go

Mark S. Wrighton

[The following article was written at the request of this issue's Editorial Committee to address the Institute-wide concerns regarding possible budget cuts and their effect on teaching and research.]

MIT is a financially strong institution, with its nearly \$2 billion endowment. Led by Vice President Glenn P. Strehle, we have just successfully completed the *Campaign for the future*, securing \$710 million during adverse economic times. We enjoy a sponsored research volume of about \$700 million per year. Having a leading position in science and technology education and research, MIT remains an attractive place for scholarship and learning by outstanding students, faculty, and research staff.

Why then is there a concern regarding the financial situation at MIT? This article, invited by the *Faculty Newsletter* Editorial Committee, is intended to demystify the current situation and will be one of several broad communications regarding the financial situation at MIT. MIT finances are complicated. Patience will be required to understand the issues and the nature of the problems beyond the simple conclusion that we are spending more money than we receive. Teamwork and collegiality will be required to both understand and address these issues.

An important fact is that MIT's underlying financial health is good, but we do face some problems. Prudent stewardship of the resources of MIT suggests that some changes are needed, in order to ensure long-term financial well-being for MIT. The time frame of such changes is three to five years, and during this time it is anticipated that we will need to reduce net expenses and/or enhance net revenue. As developed

below, the magnitude of the problem we face is an *operating gap* of about \$20 million in 1992 dollars. A second issue is that we must bring the rate of growth of expenses to the same value as the rate of growth in revenue, in order to avoid chronic budget deficits in the future. The notion that a one-time budget cut is not the solution to our problems is summarized by the sketch in the figure on Page 12.

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David Lewis
Managing Editor

Address: MIT Faculty Newsletter, MIT Bldg. 38-160
Cambridge, MA 02139; (617) 253-7303.

E-Mail: fnl@zeiss.mit.edu.

FAX: 617-253-0458

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Authors

Anne P. Glavin is Chief of Campus Police.
Alan Dyson is T.I.D.E. (Trust in Diversity
and Environmentality) Senior Education
Specialist.
Norma G. McGavern is UROP Director.
Lydia S. Snover is Senior Planning Officer.
Mark S. Wrighton is Provost.

Editorial

Community Relations

The Faculty and MIT

Each issue of the *Faculty Newsletter* is the responsibility of a small (3 or 4 member) subgroup of the Editorial Board. One of the responsibilities of this subgroup is the choice, when it seems warranted, of a theme for its issue. It appeared to us that various intracommunity and intercommunity concerns were coming to the fore, and we asked our contributors to focus, inasmuch as possible, on the theme of community. The dictionary defines community: "A body of people having a common organization or interests or living in the same place under the same rules; hence, an assemblage of animals or plants living in a common home under similar conditions." It struck us that of all the groups mentioned in this issue of the *Newsletter* – Cambridge residents, undergraduates, primary school students – only the MIT faculty do not qualify as a community.

Except in the broadest educational and scholarly sense, we have neither a common organization nor common interests; except in the broadest sense, we do not even live under the same laws. The only examples that come to mind of the faculty acting as a cohesive group occurred those few times when the status quo was changed too quickly for comfort. The faculty is a reactive aggregate, but certainly that is not enough to deem it worthy of the word "community."

Nor should the lack of MIT faculty cohesion surprise us. Its members, after all, were chosen on the basis of extraordinary individual accomplishment. It is commonplace to point out that our students do not work well together because they were selected on the basis of strictly defined individual merits; group efforts are hard to quantify and not very highly rated in our admissions process. But we ourselves were subject to even more rigorous selection procedures. Little incentive exists at MIT to change the pattern of maximizing individual achievement. Each faculty member interacts individually with his or her own department head, that head with the appropriate dean, and so on up a very rigid hierarchy. The ability to act with legitimate power derives from one's position in the organizational tree. A hierarchical structure with power (and information) that flows from top to bottom is not conducive to the formation of community.

MIT is a corporation, and the ultimate power belongs to the corporation members. MIT is not, by definition, democratic. Partially as a result of this, the faculty tends to be unorganized and apathetic. This is not to say that MIT faculty members do not benefit from a certain presumption of moral authority in the operations of the Institute. Nor do we mean to imply that the Corporation does not usually respect that authority. The recent joint Corporation/faculty committee to choose President Gray's

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MIT and the Community

A significant fraction (between 15 and 20 percent) of our students, staff, and faculty are residents of Cambridge. They have both a short- and long-term interest in the health of Cambridge as a community, and continuing productive integration of MIT into this community. Not only is the well-being of the current student body critical, but also the ability to recruit future students.

Unfortunately, recent events have further strained the uneasy relationship between the Institute and the Cambridge community (see, for example, "Concern grows over MIT projects in Cambridgeport," *Boston Globe*, December 6, 1992). They reflect, in part, the very narrow base of the decision-making process that takes place with respect to community relations.

The Choice of a Non-Union Contractor for Memorial Drive

The Institute, departing from tradition, engaged a non-union contractor for the major reconstruction and commercial development of the old Ford Assembly Plant on Memorial Drive at the BU bridge. This was perceived by the local building trades members as a significant step in the direction of the lowering of the standards-of-living for carpenters and construction workers. It has seriously eroded the relationship with a sector of the local community not previously distrustful of the Institute. Although the Institute initially claimed that this was done by a separate corporate entity, the corporation was set up by the Institute and shares officers with MIT.

Even though the Memorial Drive project is a direct real estate venture with no educational component, the bottom line should not simply be return on investment. Undermining the relationship with a sector of the Cambridge community may cause far more damage in the long run than the marginal extra profit is worth.

Relocation of the CASPAR Shelter

For some years the CASPAR wet shelter (for homeless and sometimes alcoholic Cambridge residents) has been housed on MIT property on Albany Street. The Institute recently offered to purchase a Central Square property and move the existing shelter to the new location off MIT property, in return for the city deeding over streets to the Institute which are internal to the campus. To many of the more than 300 people who turned out for the local hearing, this represented the Institute trying to dictate terms to the community. Given the history and intensity of struggles over siting such facilities, the notion that MIT could decide on the CASPAR location was shortsighted at best. The faculty learned of this after the proposal had been made to the city. The situation might have been easily avoided with input from MIT personnel resident in Cambridge and sensitive to

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The Faculty and MIT

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successor was an example of the Corporation's enthusiastic sharing of authority with the faculty in a very important matter.

It would be fanciful to believe that we can change the fundamental structure of the Institute, and we are not advocating such change. We are simply pointing out that we have come face-to-face with the realization that there is no such thing as a "faculty community" imbedded in a larger MIT community. Plans made under the assumption that such a community exists can be significantly misleading. References to such community and calls for "community action" can be either naive or disingenuous, depending upon the knowledge and motivation of the speaker.

We have flourished without community for a long while and it may be that we should not, or cannot change. Under certain temporary, usually provocative circumstances, we have acted as if we were approximating an egalitarian, democratic community. We act in such fashion very seldom. But there is a loss, because with the current situation, governance of the Institute does not benefit from the accumulated knowledge and experience of its faculty acting collectively. If we were a community in the usual sense, we might speak and act with more authority than we do, about many more issues. It is hard to imagine that the Institute and its social mission would not benefit from such broad participation.

What would lead us to desire to change from reactive aggregate to community? The prime ingredient, it seems to us, is the perceived need and opportunity to govern one's own affairs, necessarily in concert with one's neighbors. Consider, for example, the fact, startling to our colleagues at other universities, that the MIT faculty does not even choose its own faculty president, and, further, has almost no voice in that choice. Contrast the way department chairs are chosen at MIT and at almost every other major university. MIT is quite remarkably hierarchical, almost royalist.

We have in the past willingly given up the problems of self-governance for the opportunity to do our work with as little distraction as possible. The freedom to ignore governance may have been the last great luxury of the 50's and 60's but at present the way the Institute is managed and governed is having a more and more profound influence on the way we do our work. Perhaps the time has come for us to consider whether we wish to try to change the way the major decisions regarding the goals and internal structure of the Institute are made.

Nothing will change quickly. If change is to come (and perhaps nothing should change at all) it must come from the faculty. The *Faculty Newsletter* was instituted to provide a forum to discuss matters of import to the faculty. Our attempt to define community has, for us, crystallized a growing feeling that the time has come for a change, gradual and non-confrontational, in the way choices affecting the faculty are made. What do you think?

Editorial Committee

MIT and the Community

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these issues.

Constitute a Faculty/Staff/Student Community Relations Committee

These decisions illustrate the need for increased sensitivity to Cambridge community matters on the part of the Institute. To have two or three administrative people articulating the choices is inadequate, given the multifaceted impact of this class of actions. The decision processes that have such an impact on Cambridge need to be considered by a faculty/staff/student community relations committee. Such a group could make sure that the long-term interests of both MIT and non-MIT local residents are taken into consideration, and would allow for greater reflection and input into the decision-making process.

Progress in Relating to the School System

The most positive recent initiatives have been in the area of the most glaring neglect – MIT's contribution to the Cambridge school system. At a negligible level in the 1980's, recent initiatives, many of which are described in Alan Dyson's article (Page 6), are changing this situation. The K-12 Council, City Days for incoming freshmen, the certification program to enable undergraduates to teach in Massachusetts, the teaching fellows and summer science teacher institutes, are all recent examples of steps in the right direction. We applaud and encourage the continuation of such activities. Still we need to rectify situations such as a local school not having enough Petri dishes for elementary level science demonstrations, even though they are located minutes away from an institution that discards hundreds of thousands of disposable dishes a year!

MIT provides few explicit services to the surrounding community: Institute rooms are not available to community groups; no computer, data-gathering, or analytic services are provided to the city; no public lecture series aims at sharing scientific and engineering progress with the city. Although it is not surprising that we fail to provide the kind of services associated with land grant and state colleges and universities, even at Caltech the major campus lecture series (the monthly Beckman lectures) are directed at and advertised to the local community.

MIT needs a philosophy that truly serves the larger community. An office or a standing committee (with clout) is a good first step. MIT is in a fiscal squeeze, but so is Cambridge. The well-being of both communities is too tightly intertwined to proceed in other than a cooperative mode.

Editorial Committee

Letter Questions Interpretation of Federal Budget Statistics

In a letter to the Editorial Committee, Professor Gordon Kaufman (Sloan School) sent the table below, writing, "Here are some statistics on the federal budget. They don't agree with your editorial statement, however [Vol. V, No. 2]. Can we pin down the source of differences?"

Professor Kaufman's letter calls attention to a continuing source of confusion in analyzing the federal budget. 1) Social Security and Medicare are **trust funds**. Individuals pay into these funds with the expectations of receiving benefits back. These funds cannot be appropriated

by Congress to fund highways, education, weapons, or any other expression of national policy. The funds that Congress can actually authorize to implement policy are provided for almost entirely by income taxes, and as stated in the editorial "50 cents of every income tax dollar" was military spending (FY1985-FY1991).

2) "Military spending" includes the National Defense Budget (DOD, the military part of NASA, etc.), the military share of interest on the debt, veteran's benefits, and foreign military aid. In Professor Kaufman's table, military and civilian spending categories are not

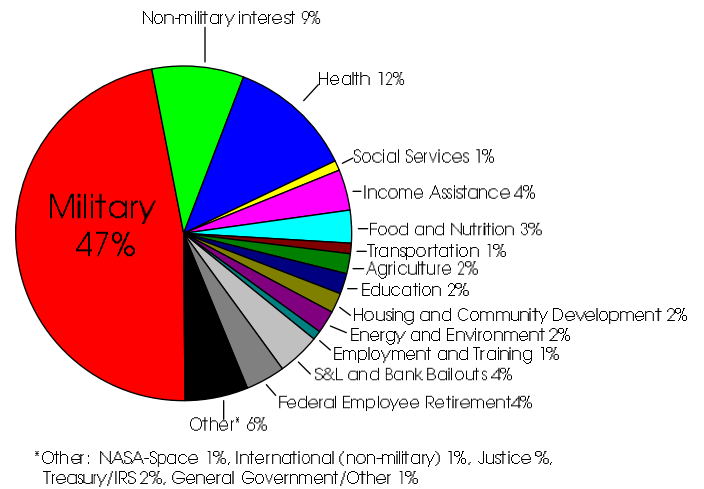
differentiated for: interest on the debt, pensions, science and space (military shuttle missions), and energy (nuclear weapons). The "veterans" costs are also a military expense.

The pie chart below shows the FY1992 budget. It was prepared by the National Jobs with Peace Campaign (38 Chauncy Street, Boston, MA 02111-9848) and was calculated from the numbers contained in the Budget of the U.S. Government, FY1992, Office of Management and Budget. Note that for the current fiscal year, the military fraction has dropped to 47%.

Editorial Committee

FY1992 Federal Budget

	Spending in Billions	% Share of Total	Your Share
Social Security	\$303	20.1	\$3223
Defense	291	19.3	3096
Interest on the Debt	210	13.9	2234
Medicare	133	8.8	1415
Medicaid	83	5.4	883
Welfare (but not food stamps or unemployment)	66	4.3	702
Pensions (civilian and military)	60	3.9	638
Education & Training	50	3.3	532
Deposit Insurance	49	3.2	521
Veterans	35	2.3	372
Transportation	35	2.3	372
Unemployment	29	1.9	308
Food Stamps	25	1.6	266
Low-income Housing	22	1.4	234
Environment, Resources	21	1.4	223
Health (but not Medicaid, Medicare)	20	1.3	212
Foreign Aid	18	1.1	191
Science & Space	17	1.1	181
Agriculture	17	1.1	181
Law Enforcement	15	1.0	159
Commerce	15	1.0	159
General Gov't Operations	14	0.9	149
Regional & Local Development	7	0.4	74
Energy	5	0.3	53
Miscellaneous Receipts	-36	-2.3	-378
TOTALS	\$1.504 trillion	100%	\$16,000



Source: The Kiplinger Letter

New Initiatives Spark Council on Primary and Secondary Education

Alan Dyson

Working with our colleagues in the public schools is not a new concept for MIT – our relationship with the Boston Public Schools goes back to the 70's in the form of the Secondary Technical Education Project – but it now takes on a new flavor. The work we are doing, be it an individual effort or part of a larger, joint program, is now considered “legitimate” in the sense that

six similar colleges and universities (ECSEL) as they search for ways to build a well-defined pipeline between communities of color and engineering.

Some faculty are also beginning to view the work by MIT students with Cambridge and Boston primary and secondary students as a legitimate part of students' MIT experience. Travis Merritt has put in place a City Days

students in the classrooms of teachers in Cambridge who were participants in the Summer Institute for the Professional Development of Primary and Secondary Teachers. For three weeks this past summer, fifty-two Boston and Cambridge teachers focused on the relationship between consumer needs, the roles that science and technology play in meeting those needs, as well as the politics of that interface.

What are we discovering and exchanging?

A friend of mine would characterize the work of MIT with teachers, students, and administrators from the public schools of Cambridge and Boston as “discovery exchanges.” From our six Teacher Fellows (all from public schools including two from Cambridge and two from Boston) we are discovering that intellectual rigor in the sciences or engineering is not the only preparation our students need before they go forth to observe and teach. They need to know how to manage twenty-five fifteen-year-olds, and they need to understand gender differences and a wide variety of different cultures. If MIT is to put in place a teacher certification program that the Department of Education sanctions, we will need to satisfy the Commonwealth that we have the intellectual resources to meet these needs.

The Council is discovering that the public schools need our knowledge and expertise in areas that focus on how the system does business. Can we convince faculty in Urban Planning and the Sloan School that it is both “legitimate” and important to:

- write proposals with planners in the public schools who want to seek ways to bring a more equitable base to the

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For the first time in MIT's history, freshmen during the 1992 R/O week participated in “discovery exchanges” with 600 Cambridge students. MIT students worked at schools throughout Cambridge, and Cambridge students spent a couple of days here on campus.

it is part of the job description for a small but increasing number of faculty, not an addition to it. Previously much of the work of faculty with their colleagues in public schools has had an *ad hoc* flavor, meaning it has not been at the heart of what faculty normally do.

By establishing the Council on Primary and Secondary Education (CPSE), a group of faculty, staff, and students have been able to legitimize working with the public schools. Susan Carey and Jeanne Bamberger, as part of their regular teaching load at the Institute, now teach a course for MIT students who wish to graduate from MIT, certified to teach in the public schools of the Commonwealth. Similarly, Ron Latanision spends a significant portion of his time leading the work of the CPSE, and Leon Trilling leads MIT's efforts in collaboration with

program that links MIT students to hundreds of younger students in Cambridge. For the first time in MIT's history, freshmen during the 1992 R/O week participated in “discovery exchanges” with 600 Cambridge students. MIT students worked at schools throughout Cambridge, and Cambridge students spent a couple of days here on campus. The Public Service Center is following up the program by linking five independent living groups with five primary schools in Cambridge and have offered thirteen PSC Fellowships that will link MIT students with thirteen science specialists in the Cambridge Public Schools during IAP.

Leon Trilling and I offer a freshmen seminar that puts UROP students and freshmen into Cambridge classrooms as part of the seminar. We have placed our

New Initiatives Spark Council

(Dyson, from preceding page)

financing of the schools;

- include school principals in business-skills seminars, because now their job descriptions call for negotiation skills;

- look at all the services a child (client) now needs and construct a plan accordingly;

- jointly examine with union and school administrators regulations that often impede change in the system?

Can the Council begin a series of exchanges with our colleagues in other similar institutions to examine what we want incoming students to know in math and science? Are there ways for the Council to work with those same

colleagues to develop comprehensive data bases of problems in physics, math, biology and chemistry that will give us a better test of a 17-year-old's thinking than the SAT's?

As the CPSE begins to tell its story to alums, business groups, and our colleagues both at the Institute and in public schools throughout the nation, we hear again and again – what's in it for MIT? The answer for some is that it provides us with an opportunity to examine the nature of teaching and learning at the Institute. For others, it provides an opportunity to take a broad look at the education our own children are receiving. Still others are certain that

better public schools mean better-educated students which will help the United States to compete in the global marketplace. One thing is certain – whenever the work of the CPSE is discussed among the faculty, it generates a wide range of responses, all of them passionate.

Let us hear from you about your thoughts and interests in MIT's K-12 efforts. Is it legitimate for your graduate students to get involved in the public schools? Do you or a colleague have a research interest in any of these issues?

A very special thanks to Arthur Steinberg and Linda Breisch for their guidance in preparing this article. ❖



MIT Club of Boston to Sponsor “Very First Science Auction”

The MIT Club of Boston is sponsoring a major fund raising event on behalf of the *Imagine That!* science literacy program. The event is called the “Very First Science Auction” and will be held on May 22, 1993 at the Museum of Science. This event is being held to increase the participation of the MIT community in this important program.

Imagine That! is an unprecedented partnership of MIT, the Museum of Science, the Massachusetts Department of Education, and WHDH-TV. It is one of five programs undertaken by the MIT Council on Primary and Secondary Education (CPSE), a body established at the Institute to implement the recommendation of the Committee on K-12 Education. The CPSE Council is

charged by Professor Ronald Latanision.

The goal of *Imagine That!* is to increase the public commitment to academic achievement, particularly in math and science education. *Imagine That!* has been designed to illustrate the relationship between math and science education and this nation's likelihood of prospering economically, socially, and politically into the twenty-first century. *Imagine That!* will explore the reasons why our children are not achieving academically and, then, consider what steps should be taken to change this aspect of our culture. *Imagine That!* intends to publicly develop the linkage between education and intellectual fulfillment while emphasizing the connectivity among job skills, the

nation's productivity, and our standard of living.

The expected attendees to the “Very First Science Auction” will be drawn primarily from the MIT community. We believe that they will value and treasure objects and services that have their roots at MIT.

Therefore, we are asking faculty to: Suggest ideas for auctionables. We will follow-up.

Contribute some auctionable. Volunteer time to follow-up (instigate) your own or other's suggestions.

Come to the auction!

For more information, contact: Jorge E. Rodriguez, (617) 270-0627, FAX 617-270-9318; Joan Martin Roth, (617) 332-5608, FAX 617-965-2567. ❖

Clean Air, Parking, and the MIT Community

(Snover, from Page 1)

quality of life in surrounding neighborhoods. The issue of parking is really an issue of transportation, environmental pollution, and land use. As an employer and major land owner, MIT is subject to various external constraints which affect who can drive to MIT and where they can park their automobiles.

The goal of the Cambridge Parking Ordinance is to meet the requirements of the Federal Clean Air Act by reducing the number of automobiles that travel to and through Cambridge everyday. The city's logic is that if people have no place to park their cars, they won't bring their cars, but will use public transportation instead. The ordinance

monitor and report on its compliance with the various regulations to which we are subject. The ultimate goal of these procedures is to provide students, employees, and visitors with reasonable access to the Institute.

As parking becomes a more limited resource in the city of Cambridge, we anticipate that there will be some hardship involved for the MIT community. Every effort will be made to maintain a system which historically has tried to be sensitive to the needs of all members of the Institute. The Parking and Transportation Committee will keep the MIT community apprised of the effects of these regulatory changes as they occur. Anyone interested in this issue should be in touch with the Committee through the Planning Office either by phone at 3-5831 or by e-mail at snover@planning.mit.edu. ❖

During the next few months, Cambridge will be conducting neighborhood hearings on the future regulation of on-street parking. Except for MDC streets such as Memorial Drive, most Cambridge streets will be restricted to residential, metered, or time-limited parking.

- The number of parking spaces available to the MIT commuting population is limited by the Federal Clean Air Act and Massachusetts state law to 36% of the commuting population. Whenever one segment of the population is issued additional stickers, another segment of the population must receive fewer stickers. There are about 18,000 individuals on this campus daily and only 4,500 parking spaces available to accommodate commuters, residents, and visitors.

- As a consequence of a new Cambridge Parking Ordinance passed last year, the number of parking spaces in the MIT inventory is fixed and cannot increase, even if the population increases. Whenever a new lot is opened or the number of commuter spaces in an existing lot is increased, we must reduce an equal number of spaces elsewhere in the system.

provides for the regulation of all parking spaces; those under the control of private employers such as Harvard, MIT, and Polaroid, as well as those in commercial parking lots and public spaces on the street. During the next few months, Cambridge will be conducting neighborhood hearings on the future regulation of on-street parking. Except for MDC streets such as Memorial Drive, most Cambridge streets will be restricted to residential, metered, or time-limited parking.

In order to comply with the spirit as well as the letter of these various regulations, MIT has put in place a parking system which allows for the allocation of parking permits based upon position and place of residence. The parking facilities are monitored and operated by the Campus Police. The data collected through the allocation and permitting process allows MIT to

Write and Wrong

Further articles on the issue of community will highlight the next issue of the *Faculty Newsletter*. We are also looking forward to commentary regarding MIT's budget concerns as outlined by Provost Wrighton.

We welcome contributions on these or any topic of interest to the MIT community. Please address all submissions to: *MIT Faculty Newsletter*, 38-160; by FAX to 617-253-0458; or by e-mail at fnl@zeiss.mit.edu.

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As pointed out by several of our colleagues, M.I.T. Numbers in the last issue of the Newsletter, "Research Expenditures Universities and Colleges" was missing three zeros, and should have been in billions of dollars. We apologize for the oversight.

Campus Crime Prevention and Security: A Shared Community Responsibility

Anne P. Glavin

The bucolic college campus hidden away from the effects of everyday urban life, is a thing of the past. During the last few years campus crime has been on the increase. The media has focused sharply on this trend and increasing awareness has led to the passage of the Crime Awareness and Campus Security Act of 1990.

As of August 1, 1992 this federal law required colleges and universities receiving federal funding to compile campus crime statistics and to make this information available to students and employees and upon request, to applicants for admission or employment. In addition it has required publication of a host of policies and procedures ranging from those dealing with reporting of crimes and emergencies on campus to campus law enforcement and its relationship to local and state law enforcement, just to name a few.

All of this has come about because urban campuses have become, in many ways, microcosms of the cities in which they are located. Murder, rape, robbery, aggravated assault, larceny, and other typically common urban crimes are no longer rare campus occurrences. While incidents of property crime on college campuses still far outnumber the amount of crimes against persons, increases of the latter – such as the recent murder of Yngve Raustein – cause the level of fear among students, faculty, and staff to increase. The challenge for MIT in the wake of such tragedies is to harness the awareness of increasing community fear and channel it into permanent changes in personal safety and security habits.

Unfortunately, as a recent informal survey of MIT students reported by *The Tech* indicated, even in light of crimes

such as murder, it is difficult to change apathetic student and community practices and procedures which make individuals more vulnerable to crime.

The Campus Police Department and the administration have taken the lead in security and safety improvements and enhancements such as additional

1. Make use of the after hours safety shuttle service, *A Safe Ride*.

2. Avoid walking (particularly alone) in isolated or perimeter areas of the campus after dark.

3. Attend a Campus Police crime prevention education seminar such as “Streetwise and Safe.”

Murder, rape, robbery, aggravated assault, larceny, and other typically common urban crimes are no longer rare campus occurrences...The challenge for MIT in the wake of such tragedies is to harness the awareness of increasing community fear and channel it into permanent changes in personal safety and security habits.

emergency phones, improvements in the service of *Safe Ride*, increased lighting and directed police patrols with higher visibility. However, this is not enough. The faculty can help. In particular, members of the MIT faculty can be instrumental in crime prevention education by finding opportunities to encourage students to develop and sustain a heightened level of responsibility for their personal safety.

Security and safety education such as discussion about changing crime trends, the increase of violent crime and the need to place safety practices above personal convenience can help to decrease apathy to these issues. Repeated encouragement of simple crime prevention practices can have a positive affect in changing risky behavior. Here is a short check list of safe practices that can reduce crime in our community:

4. Participate in *Project Awareness*, the student version of the campus crime prevention coordinator’s network, as a means of promoting campus safety and making constructive suggestions for improvements or enhancements.

Faculty may wish to invite members of the Campus Police Crime Prevention Unit to talk to students in informal settings or in classes as a way to impart advice on how to reduce the risk of criminal victimization. It would be a tragedy for any student to have his or her education derailed for fear of crime. The responsibility for community safety and security is a shared one. Experience at MIT and elsewhere has shown that cooperation in crime prevention education can be effective in reducing the level of fear and the risk of criminal victimization.



UROP: What the Numbers Show

Norma G. McGavern

Although UROP will have been part of the undergraduate experience for twenty-five years by fall 1994, not many statistics about the program have been passed on to the MIT community. News articles have described unusual and interesting projects and mentioned wide or growing participation. References to UROP are ubiquitous. Yet, few who are not faculty coordinators or who have not had the occasion to talk with us about trends and issues have heard much in the way of specifics. At a meeting we held early in October this year for our UROP faculty coordinators, we shared some UROP data that we believe others will also find interesting.

First, a look backward. Some faculty will remember the first UROP Directory published in September 1969 (yellow, even then). That slim booklet listed about 150 faculty in twenty-three academic departments and four interdisciplinary laboratories who were willing to offer research opportunities. The four "laboratories" were: (1) an interdisciplinary effort called the Cambridge Project, (2) the Educational Research Center whose aim stated in that booklet sounds very current, to "encourage and support outstanding scholars in applying their insights and skills to the improvement of teaching" and (3) Project MAC, an acronym for "Machine-Aided Cognition" or "Man and Computer," and (4) the Student Information Processing Board, still known as SIPB. This year's UROP Directory lists all the academic departments plus 40 laboratories and well over 800 faculty. In that first year, about 500 students did UROP projects. Tuition then was \$2,150, and the financial aid "self-help" level was \$930. MIT's minimum hourly student wage was

\$1.60. We supported the research of those 500 students with a little over \$60,000 of our funds which went almost entirely for materials. (Many faculty worried that students might break equipment or use up materials without having made any contribution to the work at hand, and wanted to come through this experience at least without losing money.) Our ability to waive the overhead charged on student wages paid with sponsored research funds did not yet exist.

payments stipends, whether paid with our own funds, sponsored research funds, or some combination of both, as most faculty supervisors certainly know. This, despite the need for students to be accountable hourly. Students receiving any or all of their stipends from UROP's own budget have always had to keep to a fixed hourly rate. Admittedly arbitrary on our part, it allows us to parcel out limited funding more widely, and provides an incentive to move a deserving

Who are these UROP participants? A "snapshot" of total participation in spring 1992 showed 44% of all undergraduates doing UROP work. We estimate that about 75% of all undergraduates have done at least one UROP project in four years.

Just a few years later, in the 1973-1974 academic year, participating students numbered over a thousand. UROP waived overhead costs on nearly \$11,000, the first overhead waivers, ever. Few faculty had funds for undergraduate researchers at first, but it wasn't long before they did: the following year, students – 300 of whom took up UROP projects during the summer – earned about \$190,000 from sponsored research. The numbers have been climbing upward ever since. Our own budget of UROP money inched up meanwhile, buoyed now and then by gifts and grants. In the 1980-1981 academic year the amount students earned from faculty sponsored research alone topped \$1 million. By the 1991-1992 academic year this figure had risen to \$3.9 million. We expect it may top \$4 million by the end of this year.

We have always called UROP

student onto other funding. This fixed pay rate has moved apace with the Institute minimum student hourly rate. In some years UROP paid slightly more. In years when our budget fell behind and we chose to limit wages instead of participation, we paid less than the Institute minimum. Right now we are only \$.15 apart, UROP's favor, with a \$6.90 hourly UROP rate.

The mid-eighties were a turning point for UROP. Rising tuition was beginning to have an impact on student decisions. Through most of the 1970's the portion of UROP students working for pay (counting the term only, not summer) comprised roughly 35% percent of all UROP participants. The 1980's began with the portion of students working for pay having reached 40%. In the 1983-1984 academic year the pay-credit ratio

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UROP: What the Numbers Show

(McGavern, from preceding page)

shifted with finality. In that year, and every year thereafter, the percentage of students working for pay was in the majority. In the late 1980's the pay portion rose above 50%, then above 60%. In the 1990's it rose into the 70% range. Last year 78% of UROP participants working during the term did so for pay. Not surprisingly, the number of students working full time on UROP in the summer (a pay period for almost everyone) also grew yearly. Last summer a thousand students were on campus working on UROP projects. In IAP, it is a rare UROPer who is not either beginning or continuing research.

Who are these UROP participants? A "snapshot" of total participation in spring 1992 showed 44% of all undergraduates doing UROP work. We estimate that about 75% of all undergraduates have

done at least one UROP project in four years. The smallest proportion of participants is first year students (under 300 last year), most of whom began work in their second semester. The largest group is juniors (about 650). Women comprise the same percentage of UROP participants as they do of the undergraduate population, a statistical relationship that has been stable over a period of several years. The proportion of underrepresented minority students has remained small, as was noted in the October issue of this *Newsletter*. While underrepresented minority students represented 15% of the MIT population in the last academic year, they comprised only 7% of those involved with UROP. In 1990-1991 these numbers were 13% and 5%, respectively.

Soon we hope to have better and richer

information. A survey of undergraduates and faculty which we will do later this year – we have not surveyed the community about UROP since 1981 – should give us more detailed information about participation and why it has grown in some quarters and not in others. We expect it to yield helpful information about the influence UROP has on decisions that undergraduates make about their studies and careers. Suggestions about questions we might ask and issues we should explore are very much welcomed. They should be sent to ngavern@athena, poo@athena, or alipson@sloan.



Letters

To The Faculty Newsletter:

Recently the MIT community was informed (*Tech Talk*, Nov. 18, 1992) of "the resolution of the lawsuit brought by Professor Cynthia G. Wolff against MIT." The joint statement issued by both parties to the suit declares "...that a resolution at this time is in the best interests of MIT and the individuals involved, before the need to determine the merits of the action and in order to move forwards as a community."

The "best interests" of what "individuals involved," I wonder? Surely not those individuals on the Literature and Women's Studies Faculties who were accused in Professor Wolff's suit of sexual harassment, excluding her courses from the Women's Studies program, conspiring to discredit her in

the profession, as well as sundry other misdemeanors. Professor Wolff publicized these charges nationally: substantial articles citing her complaint appeared in *The Chronicle of Higher Education*, *The New York Times*, *Boston Globe*, *Los Angeles Times*, and several ultra-conservative periodicals. I imagine the MIT administration did what it thought to be in its own interest. After all, allowing a suit to come to trial involves substantial expenditures of money, time, emotional and intellectual energies. So it's easiest to settle. But what of the "best interests" of the faculty members who were smeared by Professor Wolff? They are left to fend for themselves. Yes, they could sue Professor Wolff. But unlike the administration, they cannot afford the financial investment necessary, not to

speak of the disruption a drawn-out legal procedure would cause in their lives. Essentially, these faculty members have been hung out to dry.

Is this what it means "to move forward as a community"? The message of "the resolution of the lawsuit" to MIT faculty members is that we need not expect the administration to stand by us when maligned by personal charges which are false.

Lest readers believe that the above is merely the aggrieved complaint of someone accused by Professor Wolff, I assure them that her suit did not name me as one of her harassers.

Louis Kampf
Professor of Literature
and Women's Studies

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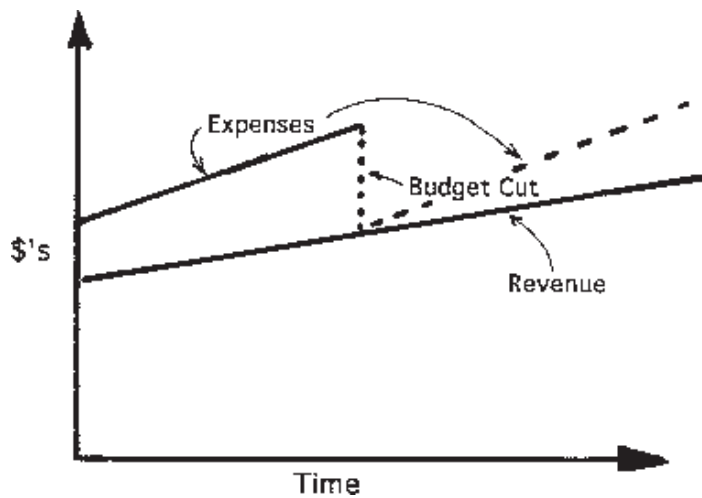
(Wrighton, from Page 1)

Diagram illustrating that a one-time budget cut does not solve long-term problems. The divergent slopes of the expense and revenue plots show that a one-time budget cut solves the budget deficit for only one point in time.

Strong External Forces

The situation we face stems from a number of factors, many of which are external forces. These include a generally weak economy, changes in the nature of the partnership between research universities and the federal government (particularly rule changes regarding indirect costs of research), decline of federal support for undergraduate financial aid, and changes in the rationale for maintaining a strong set of research universities. The changing world scene has resulted in loss in support (largely from the Department of Defense) at our Lincoln Laboratory, down from a FY90 high of about \$440 million to about \$380 million in FY92. The weak economy manifests itself in two important ways: contributions to MIT are more difficult to obtain and our undergraduate students are "needier" resulting in larger financial aid expenses. It is also more difficult to secure research funding commitments from industry in an era of economic constraint. Simultaneously federal research support

overall has leveled, or in some agencies (e.g. NSF) even declined in real terms.

The support from the federal government for undergraduate financial aid has declined dramatically in the last decade, an amount by itself which is larger than the anticipated \$8.5 million deficit in MIT's FY93 operating budget. Government support of the cost of education in connection with its NSF Predoctoral Fellowships has not kept pace with increases in costs in the university, resulting in more of the costs being born by the institution. More recently, the NIH traineeship programs have been adversely affected by new rules governing the fraction of tuition that can be supported by this mechanism. Changes in the indirect cost recovery rules in FY92 alone resulted in losses in revenue of more than \$2 million. The lower recovery of indirect costs has the favorable effect of tempering the indirect cost rate, but now more of the legitimate, but indirect, costs of research must be supported by general funds. It now appears that after October 1, 1997 we

will no longer be allowed to use the fringe benefit pool to support tuition for graduate research assistants and graduate teaching assistants. This is presently estimated to represent a loss of more than \$10 million in annual revenue for support of graduate student tuition.

While the external forces are outside of our control, we must cope with them and address the attendant problems—MIT is not alone in dealing with such issues, as many news accounts will attest. In 1990-1991, 45% of the nation's colleges and universities announced mid-year budget cuts to deal with their financial problems. In 1991-1992, 57% implemented mid-year cuts. Fortunately, the leadership and stewardship of President Paul Gray and Provosts Francis Low and John Deutch positioned us well, and we have been able to absorb a high degree of adversity. Now we must draw together as a community to first understand and then deal with these financial issues.

Budget and Revenue

The MIT budget in FY92 was about \$1.1 billion, slightly less than the budget in FY91. A budget lower than the preceding year has only been experienced at MIT a few times in its history. The lower FY92 budget raises some concern, but this alone is not a problem. After applying about \$6.8 million in unrestricted gifts (representing all such unrestricted gifts received) to the operating budget, the budget deficit for FY92 was \$6.3 million. Reserves and discretionary funds were used at year-end to fund this deficit. A one-time budget deficit of this magnitude, though serious, does not suggest the need for immediate changes either. Rather, we need to examine the revenue sources, the trends in these and the expenses, and certain institutional goals, in order to understand the implications of the

(Continued on next page)

MIT Finances

(Wrighton, from preceding page)

smaller budget and the budget deficit.

Revenues for MIT's activities come from tuition payments and other fees, research grants and contracts, gifts, and endowment income. Research grants and contracts, comprising a sponsored research volume of about \$700 million, represent the largest revenue category. All other revenue is thus only about \$400 million. Tuition payments were about \$170 million, but this number is complicated by the fact that a large fraction of the graduate student tuition payments are from the fringe benefit pool funded both from research grants and contracts and general funds used to pay salaries. Endowment income for all purposes was about \$100 million, and gift income for all purposes was about \$100 million. These data are summarized in the figure on Page 14.

MIT's operating budget is dominated by expenses attributable to sponsored research programs, largely supported by grants and contracts. Indeed, when one removes the \$700 million in sponsored research, the overall operating budget is reduced to about \$400 million. Further, "Auxiliary Activities" which pay their own way such as the MIT Press (\$16 million) and the Campus Dining and Housing Services (\$18 million) further reduce the remaining operating budget. The point is that the FY92 budget deficit of \$6.3 million is even more significant when viewed against this \$370 million "core" operating budget directly controlled by the Institute. The \$6.3 million deficit is just under 2% of this core operating budget.

Institutional Goals and Objectives

There appear to be a few institutional goals and objectives which should be highlighted as the financial situation is considered. While there can be much debate regarding particular programs and priorities, the following five objectives

seem to be ones to which the MIT community has subscribed.

1. Excellence in Science and Technology. President Vest and I are committed to working to enhance MIT's position as a leading research university focused on science and technology. The Institute is regarded as the leading institution of its kind in the world, and we aim, above all, to preserve and

Despite the weak economy, salaries for the "best" are being increased at rates beyond the consumer price index. MIT must continue its efforts to provide compensation packages which properly reflect the high quality of its personnel.

enhance its stature. We all recognize, however, that a focus on science and technology is expensive. We can be proud of what has been achieved with the resources available to us, but it is evident that there will be increasing "competitive" pressures that we will need to address, if we are to maintain our preeminence.

2. Affordable Tuition. An important objective in our financial planning must be to maintain MIT as a place that is accessible and attractive to students of diverse economic circumstances. Continued temperance in the rate of growth in tuition is viewed as critical, and yet this is the only income stream over which we have immediate and certain control. Last year's increase in tuition of just over 6% was the second lowest in two decades. MIT's self help level (academic year income from jobs, UROP, or loans) at \$6,600 is also high in comparison to other institutions, and efforts must be expended to temper growth in this area as well.

3. Merit-Based, Need-Blind Admissions.

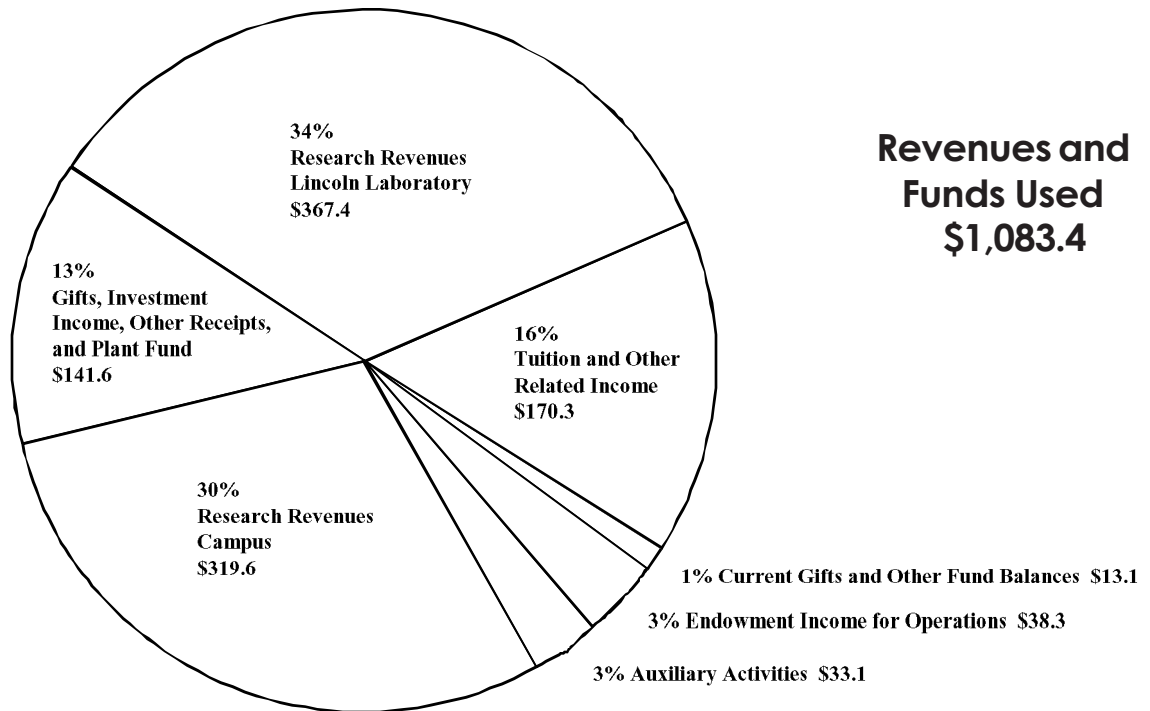
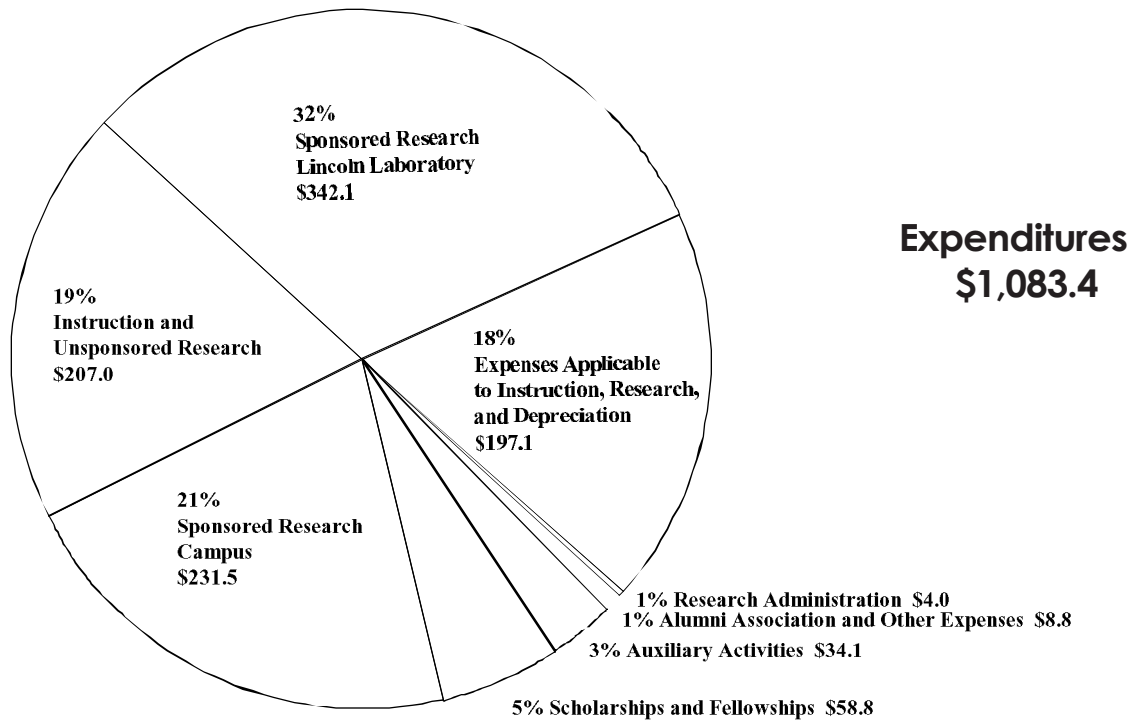
A strong traditional practice and one which we have aggressively defended is the process of merit-based, need-blind admissions. The rewards of this policy are evident in the undergraduate student body, diverse in every dimension, and excellent by every quantitative measure. Our education and research programs are accessible to the best students

wherever they may find themselves on the family income ladder. We have the objective of maintaining our highly successful admissions policy, despite its considerable cost. Table I (Page 15) shows that the amount of undergraduate scholarship aid beyond that from endowment income restricted for this purpose exceeds, by a factor of two, the FY92 budget deficit. The six-year trend in resources committed to undergraduate financial aid shows no abatement, and the growth in endowment income has been too low to cover the growth in need. Recent government legislation suggests that changes in the basis for establishing "need" will add to our undergraduate financial aid burden in coming years.

4. Competitive Salaries. Despite the weak economy, salaries for the "best" are being increased at rates beyond the consumer price index. MIT must continue its efforts to provide compensation packages which properly

(Continued on next page)

**Current Operations 1992
(in millions)**



Summary of MIT revenue and expenditures for FY92 from the Report of the Treasurer for the Year Ended June 30, 1992.

Table I. Resources provided to support undergraduate financial aid for needy students.

Fiscal Year	Endowment Income*	General Funds	Total**
1988	\$5.4 million	\$7.0 million	\$12.4 million
1989	6.4	8.5	14.9
1990	7.6	9.5	17.1
1991	8.0	11.6	19.6
1992	8.5	13.8	22.3
1993***	9.0	16.0	25.0

* Income from endowment restricted to support for undergraduate financial aid. It should be noted that during the Campaign for the future the commitments to this endowment were about \$40 million.

** This total does not include approximately \$6 million in each year provided from "restricted" sources, including, for example, scholarships awarded to students by external organizations and managed by MIT Office of Financial Aid.

*** Estimates are provided for FY93. These are estimates, because Spring, 1993 need and enrollment are not certain. However, these are probably within 10% of the final data.

Table II. Progress in "hardening" academic year salaries of MIT faculty.

Fiscal Year	Total AY Salary	Supported by Research*	Fraction on Research, %
1987	\$49.0 million	\$8.2 million	16.75
1988	52.8	8.2	15.59
1989	54.7	8.5	15.55
1990	58.5	8.2	13.95
1991	62.4	8.2	13.20
1992	66.4	7.8	11.81

*To reduce the faculty salaries charged to research to zero would require the equivalent of about \$200 million in endowment to create an income stream of about \$10 million to support the salary and benefits of the faculty.

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(Wrighton, from preceding page)

reflect the high quality of its personnel. Salary freezes or many years of low raises would compromise our overarching aim of attracting and retaining the most outstanding people to the Institute and must be avoided.

5. Faculty Development and New Programs. We must maintain the financial strength needed to attract and nurture the careers of the most outstanding faculty. In science and engineering, experimental facilities are especially expensive, but outstanding faculty in these areas are vital to preserving MIT as the leading institute of science and technology. Further, there will be **no financial excuses** for not attracting more women and members of underrepresented minority groups to the faculty. Additionally, from time to time, faculty need resources to initiate new programs. New resources have been wisely dedicated to initiatives like those associated with enhancing the Athena Computing Environment with new hardware, the Program in Environmental Engineering Education and Research, the Joint Program on the Science and Policy of Global Change, the introduction of the new biology requirement, and the institutionalization of the Leaders for Manufacturing Program. These initiatives required seed and/or continuing financial resources to become successful, and we must preserve our flexibility to undertake major experiments in education and in research.

Finally, regarding faculty development, I am pleased to report progress on an important objective, “hardening” of faculty salaries. The rationale for this objective is several-fold: (1) the commitment to faculty salaries improves the quality of life of faculty; (2) federal agencies, such as NSF, are increasingly reluctant to support academic year salaries, (3) academic year salaries budgeted in research

proposals make our applications appear to be less competitive than those from many of our peer institutions which pay full academic year salaries; (4) when a proposal is funded there is often a “bottom line” support level such that full academic year salary support can be used to fund more students; (5) there is less pressure to undertake uninteresting research projects; and (6) full academic year salary support builds morale and Institute loyalty. All new faculty appointments now carry full academic year salary support, as do all new appointments to named professorships. As Table II (Page ?) shows, the fraction of all faculty academic year salaries charged to research grants and contracts has dropped significantly. There is still a great deal to do in the School of Engineering and in certain departments in the School of Science. The point to note is that steady progress has been made and one can see that significant resources have been expended for this purpose. The equivalent of about \$100 million in endowment has been dedicated to hardening faculty salaries. Unlike the undergraduate financial aid problem, this one shows a favorable trend!

Current Budget Situation

1. The FY93 Budget Deficit. After budgeting \$7.5 million in unrestricted gifts, the FY93 budget is expected to show a deficit of \$8.5 million. The operating gap, therefore, for the year is anticipated to be \$16 million, up from the \$13 million operating gap in FY92 and \$9.3 million in FY91. The FY93 budget deficit was reluctantly approved at the November 6, 1992 meeting of the MIT Corporation Executive Committee. This budget deficit is larger than that originally approved by the Executive Committee at its May, 1992 meeting, because the recurring adverse factors affecting the FY92 budget were not known in May. These “recurring” factors

include the loss in indirect cost recovery, lower unrestricted gifts, and needier undergraduate students. The expenses associated with these factors carry forward year after year.

2. Recent History of Use of Reserves and Discretionary Funds. For the past several years, we have expended all current unrestricted gifts for the purpose of supporting the current operations of the Institute. The sum of unrestricted gifts for the past four years was in excess of \$29 million, all applied to meet needs of the ongoing operations. This \$29 million is in addition to the over \$15 million of other discretionary funds and reserves spent to cover budget deficits at year-end for the past four years. Thus, nearly \$50 million in discretionary resources have been expended to meet current needs during the past four years—this is significantly more than the amount of new endowment added for undergraduate financial aid during the same time period. In better economic times, the financial situation has been such that a substantial fraction of the unrestricted gifts were put in unrestricted endowment, thereby making available an income stream which could be used to achieve our objectives of tempered growth in tuition, hardening of faculty salaries, or increasing salaries. The point now is that we are rapidly expending our financial flexibility, and this is occurring at such a brisk pace that we must now consider changes in what we do and how we do it. The ideal situation would be to close the operating gap in FY93 by \$16 million.

The Magnitude of Our Financial Problem

Rising needs for undergraduate financial aid, reasonable increases in salaries, level or declining research support, and tempered growth in tuition in the next several years suggests that

(Continued on next page)

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(Wrighton, from preceding page)

the operating deficit will grow. Further, we will be increasingly dependent on unrestricted gifts to support the activities of the Institute. How much the deficit will be depends largely, of course, on what we set as salary increases on the expense side and what we set as tuition on the income side. It is easy to envision a growth in budget deficit to more than \$22 million by the end of FY96 with average salary raises slightly higher than

in unrestricted endowment. \$10 million is about the sum of the FY93 base general budgets of the Departments of Chemical Engineering and Civil and Environmental Engineering, the base general budgets of Physics and Mathematics are each about \$10 million. \$10 million is about 1/2 the entire FY93 base general budget of the School of Humanities and Social Science.

To illustrate another dimension of

It should be emphasized that the foregoing specific examples are intended to illustrate what \$10 million represents and some of the complexities underlying the support for even our core departments and services.

The magnitude of the problem in connection with the divergent slopes of expenses and revenue (see figure, P. ?) is a small percentage, but a small percentage of \$1.1 billion can be significant in absolute terms. Three contributors to the increase in expenses are increases in salaries, increases in academic program (recently \$1.5 million per year), and increases in services and administrative functions (recently \$0.7 million per year). Understanding other factors contributing to the divergent slopes requires more detailed study.

What About Using Our Reserves and Endowment?

There are some who argue that we have properly set money aside in more prosperous times for the purpose of weathering such times as these. However, there are only two major "unrestricted" reserves that could be tapped. One is the so-called Investment Income Reserve of about \$67 million in market value, and the other is the Research Reserve with a market value of about \$43 million. As is developed below, these reserves are both needed for purposes other than to provide the discretionary resources needed to cover the operating deficit. In any event, use of the reserves to cover the budget shortfall over a small number of years will deplete these resources as well. The bottom line regarding use of our reserves is that they are simply not large enough to do anything other than to defer our problem for a few years. Considering the uses to which the reserves are currently put, depleting the reserves yields other financial problems.

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Rising needs for undergraduate financial aid, reasonable increases in salaries, level or declining research support, and tempered growth in tuition in the next several years suggests that the operating deficit will grow....How much the deficit will be depends largely, of course, on what we set as salary increases on the expense side and what we set as tuition on the income side.

budgeted for the next three years and tuition increases only slightly lower than our current budget plan. Lower average raises and higher increases in tuition would moderate the growth in the deficit, but *Academic Council has reviewed the details and concludes that the end of FY96 brings a budget deficit of at least \$10 million, coupled with a dependence on \$9 million per year in unrestricted gifts. Thus, the operating gap approaches \$20 million in even the most optimistic forecasts of Institute finances. It is this problem that we need to address in three to five years.*

A \$10 million deficit is not a large fraction of the general budget, but in absolute terms this deficit is large. To give a sense of what a \$10 million deficit represents, I will give a few examples to illustrate. \$10 million is equivalent to the anticipated income from \$200 million

complexity in the financial situation, consider the Libraries budget. \$10 million is somewhat less than the total budget for the MIT Libraries. However, even if we were to cut the entire budget for the libraries, we would not have **net** savings of even \$10 million, because about 1/2 of the cost of the libraries is attributed to research and is a component of the indirect costs of research. (In a similar vein, cutting the entire Office of Sponsored Programs would apparently save nothing net, because most of the costs are covered as an indirect cost of research.) The point is that in suggesting some mechanism for "solving the problem" one has to be cognizant of gross versus net savings. It is estimated that a net savings of \$10 million could be achieved by gross cuts of \$15 million, depending, of course, on just what it is that is cut.

MIT Finances

(Wrighton, from preceding page)

Decapitalizing the endowment, that is spending some or all of its principal, is the only other alternative and this has the unfavorable consequence of accelerating the problem, because funds that create income are depleted. Decapitalizing the endowment erodes confidence in MIT among future donors and threatens the

and in some years the cash generated may not be enough to meet the declared rate. This year, for example, each Pool A share yields \$13.70. This "yield" is analogous to the income from a share of a mutual fund, and our management goal has been to maintain or slightly exceed buying power of the income year

biology building expenses with other general funds.

The Research Reserve was created, in part, to cover faculty salaries for a short period in the event of a catastrophic collapse in federal funding. Considering the uncertainties in federal support at present, it should be comforting to know that such a reserve exists. Having made progress in hardening of academic year salaries for faculty, one could argue that the magnitude of the Research Reserve can be smaller. However, there may be unanticipated needs to assist faculty and research staff in the event of interruptions or loss of research support. Further, earnings from the Research Reserve were critical to funding the deficit at the closing of FY92 and similar needs are expected at the end of FY93. Rapid depletion of the Research Reserve can be anticipated if the budget deficit goes unchecked.

MIT's reserves are simply too modest to be relied upon as the source of funding for a deficit of \$10 million. The two major reserves that we have are prudently deployed and play a vital role in maintaining our strength and flexibility.

Process of Planning and Review

Early in 1992 some of the financial issues began to become apparent to a faculty/administration Ad Hoc Committee on Indirect Costs and Graduate Student Tuition chaired by Professor Robert Weinberg. I appointed this committee to provide advice on the issues surrounding the possible changes in policy related to the support of tuition for graduate research assistants and graduate teaching assistants. This Committee is now being reconvened, as the Office of Management and Budget policy changes have recently been made public. This will be one group providing advice regarding options and priorities.

In the summer of 1992, when the adverse financial factors affecting the

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In view of the projected financial difficulties and after several discussions with Academic Council, I asked all individuals reporting directly to me to provide a scenario for coping with a 2% per year reduction in budget in each of the next three fiscal years.

high rating we currently enjoy in connection with bond offerings to fund capital projects such as the new biology building. Lower bond ratings would, of course, escalate financial problems as lower ratings mean higher interest payments. MIT's endowment is invested such that the buying power of the income remains constant or even increases slightly. For example, a donor of an endowed professorship expects that a professor will be supported, even though the individual will enjoy increases in salary while holding the professorship. Basically, our investment policy is one which reflects the wish of the contributors to provide lasting support to the Institute.

Consider now the two major reserves and their purposes. The purpose of the Investment Income Reserve is to make the "cash" payments on the Pool A shares of the endowment, in the event that the endowment income is inadequate to meet payout commitments. The point is that not all of our endowment is invested in assets that yield cash income,

after year. In the last several years the Pool A share income has increased nearly 5% per year. The "market value" of each Pool A share is almost twenty times the income. Thus, the spendable income from endowment is a little less than 5% of its market value. At one point in recent history the Investment Income Reserve was about equal to the total payout from the endowment. Now, with a payout total of about \$100 million, the Investment Income Reserve is only 2/3 of the total payout. Even so we are fortunate to have this "flywheel" in the system which provides a degree of certainty in spendable endowment income. It should be realized, too, that the Investment Income Reserve earns income. Importantly, the earnings from the Investment Income Reserve will be applied to support interest expenses from the borrowings needed to construct the biology building. Thus, spending the Investment Income Reserve itself, in order to cover the deficit, creates the problem of having to cover more of the

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(Wrighton, from preceding page)

FY92 budget became apparent, President Vest and I began to review the Five-Year Planning process which is done by all units on an annual basis. In view of the projected financial difficulties and after several discussions with Academic Council, I asked all individuals reporting directly to me to provide a scenario for coping with a 2% per year reduction in budget in each of the next three fiscal years. The Five-Year Planning exercise is our usual process for establishing budget priorities, but it is true that this year I called for greater emphasis on how to cope with a more constrained financial era. The plans were to contain priorities and costs for ongoing programs and for proposed new programs. I have recently reviewed the Five-Year Plans, and there has been much creative thought given to ways of improving our educational and research programs. The department and section heads have worked very hard, and their efforts are evident. Some important decisions regarding both new and ongoing programs are to be made in the weeks ahead, and the Five-Year Plans advanced by the academic units have provided much of the input needed.

In parallel with the call for the Five-Year Plans an effort has been made to communicate the essence of this article to the leadership of the Institute. President Vest's annual report dealt with the costs of higher education, and has been disseminated broadly here and elsewhere. I briefed Academic Council on several occasions during the fall of 1992; the Department Heads were briefed twice; Faculty Council was briefed with the same materials by President Vest; I have met with School Councils and individually with each person reporting directly to me; the Faculty Policy Committee was briefed; I met with the senior staff of the Dean for Undergraduate Education and Student Affairs; the senior

staff of the Libraries was briefed. The MIT Corporation Executive Committee has been briefed on two occasions, and the entire MIT Corporation was briefed at its December, 1992 meeting. The Corporation Joint Advisory Committee and MIT Medical Management Board were briefed in early December, 1992. I remain receptive to more invitations to speak on the issues we face; each group has had valuable input, questions, and suggestions.

The Academic Council held a day-long retreat to discuss MIT finances on November 19, 1992. The group reviewed progress since President Vest's inauguration, and held an extensive "brainstorming" session on how to balance our objectives, aspirations, and goals with fiscal reality. In subsequent regular meetings of Academic Council, the 20-person group has agreed to undertake a review of cross-cutting issues. Four subgroups have been formed and each will draw on members of the MIT community as it undertakes its task. One group, chaired by Vice President Glenn Strehle, is to examine opportunities for enhancing revenue; a second group, led by Associate Provost Sheila Widnall, will review academic areas; a third group, led by Vice President J. David Litster, will review support services; and a fourth group, led by Vice President James Culliton, will review administrative functions. These are cross-functional groups; each is served by at least one academic dean and a high level member of the administrative support staff. The objective is to provide guidance in closing a \$20 million operating gap (including a \$10 million budget deficit) over a three- to five-year period. In providing this guidance the review groups will focus on improvements and efficiency enhancement, as well as areas for possible reduction, reorganization, or elimination.

A budget plan is to be submitted to the MIT Corporation Executive Committee in May of 1993.

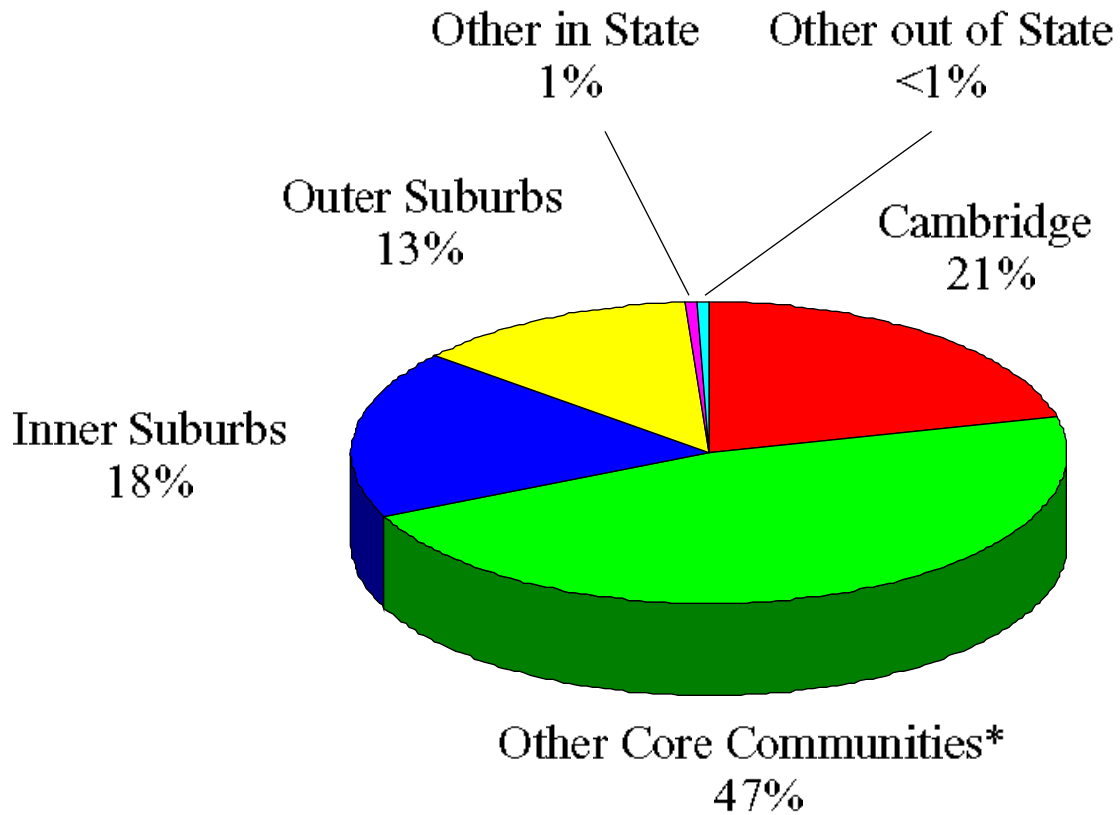
MIT Problem Solving: A Community At Work

The financial problems that face us are not of crisis dimensions. Rather we face a situation that needs to be addressed over a period of time, in order to strengthen the Institute both in terms of finances and in the excellence of its educational and research programs. Working continuously to enhance excellence is not new, but we must re-commit ourselves to this task in a timely fashion. Evidence that committed effort is rewarded comes from experience with our efforts to conserve energy: we have saved about \$100 million in energy expenses over two decades. On the academic side, we have also made some remarkable progress as an institution in the recent past, including maintenance of our admissions policy, hardening of faculty salaries, development of a campus-wide computing environment, enhancement of diversity in our undergraduate body, construction of a state of the art microfabrication facility, construction of a facility for biology research, and initiation of major educational and research efforts including Leaders for Manufacturing and global environmental programs. These achievements are the result of strong faculty, staff, and student resolve to sustain MIT's leadership role and prudent deployment of our financial resources. We cannot afford to support all faculty or student initiatives. The task before us is one of setting priorities, and executing our mission with available revenue. As a community, we must understand and address the financial circumstances that represent the boundary conditions of the problems that need to be solved.



M.I.T. Numbers

Place of Residence of MIT Faculty (1991-1992)



*Other Core Communities include: Boston, Somerville, Brookline, Newton, Arlington, etc.

Source: MIT Planning Office;
Data Provided by Personnel Office