Strategic Planning for

Funding Research

at the University of Rhode Island

Submitted by request to the
Research and Outreach Strategic Planning Committee
February 13, 2001
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URI's Place as a Rhode Island Research Provider

Rhode Island's thirteen technical institutes, colleges, and universities offer high quality, often distinctive, training for the modern workforce, producing some 15,000 graduates annually. Of these 13, only the two research universities—Brown and the University of Rhode Island— produce scientists and engineers, and leading-edge new-economy technicians and entrepreneurs. They are our best source for new ideas and inventions upon which to build the new businesses and jobs which are critical to our economic development and the future of our state.

Rhode Island's two research universities are different. Brown is private. It has a $1.5billion endowment. While Brown research may ultimately lead to public good, that is not inherently the prime function of research in a private university. URI is public. Its endowment is $0.06 billion. As a state and federally supported institution, it is ultimately accountable to the taxpayer for its research. As Rhode Island's only public research university, URI must serve as the robust and consistent provider of research and technical outreach that Rhode Island needs for economic growth and prosperity.

RI Higher Education

Brown University

Bryant College

Community College of Rhode Island

Johnson and Wales University

Naval War College

New England Institute of Technology

Providence College

Rhode Island College

Rhode Island School of Design

Roger Williams University

Salve Regina University

St. Joseph Hospital School of Medical Technology

The University of Rhode Island

Factors Affecting the Strength of URI Research

The ability of URI to serve as Rhode Island's public research university is affected by leadership, competitive edges among the faculty, and availability of institutional, industrial, private foundation, federal, and state funds.

Federal Funds

The federal deficit of the 1970's and 1980's eased in the late 1990's, due to a combination of general economic health and restrictive government spending. Although the government is now technically in a surplus, that surplus is quite small after accounting for the social security component (fig. 1).

Efforts to keep the budget trim constrain the relatively small portion of the federal budget that is available for discretionary spending. Major federal research and development agency budgets are projected to be flat through 2005 (fig. 2).

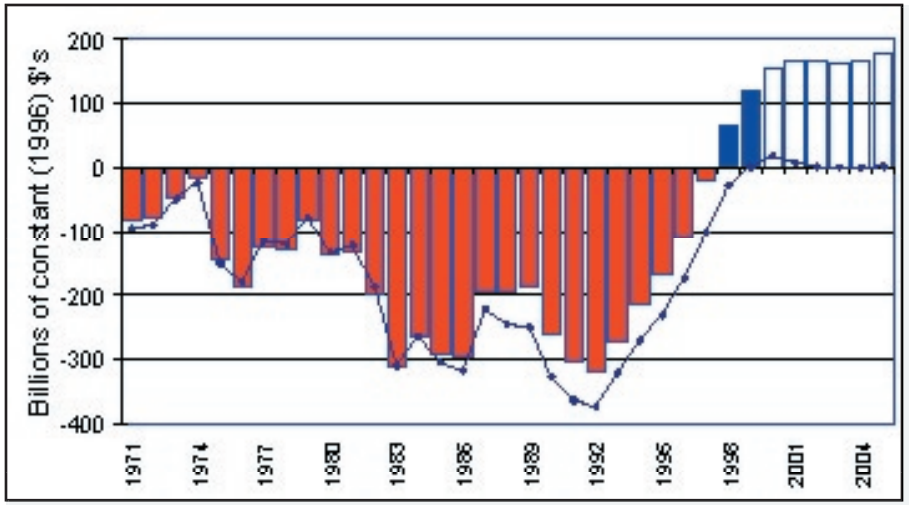

Fig. 1. Federal deficit/surplus in constant (1996) dollars, 1971 to 2005. Bars include social security revenue; lines do not (Source: US Budget Historical Tables)

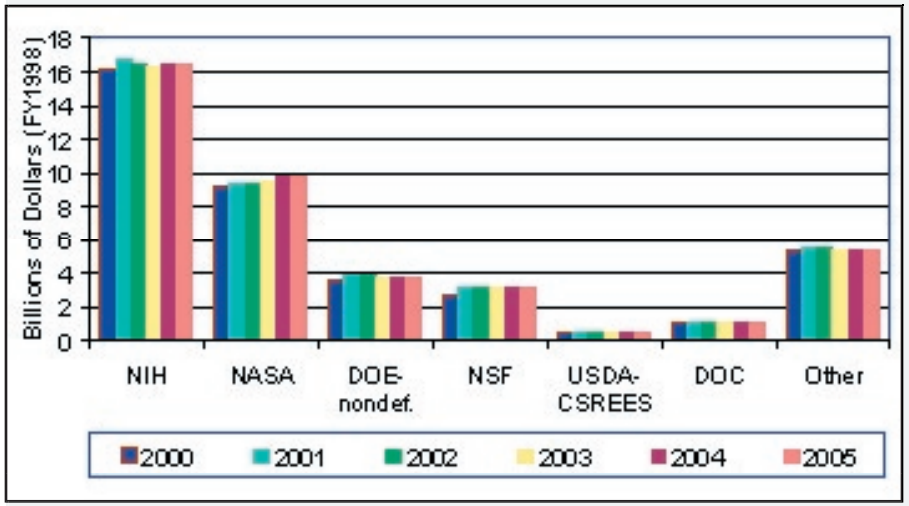

Fig. 2. Projected reseach and development budgets of seven federal agencies, 2000 to 2005 (Source: AAAS, based on agency estimates).

National Trends

Nationally, funds available for academic research doubled from the early 1980's to 1998. Growth in federal funds is expected to slow through 2005. Federal funds support about 55% of total academic research expenditures nationally, with 5/6^{ths} of this coming from three agencies—the National Institutes for Health (NIH, 58% of the federal total), the National Science Foundation (NSF, 15%), and the Department of Defence (DOD, 10%). The portions of research expenditures from institutional funds and from industry have grown slowly but steadily since the 1980's (fig. 3).

State, Institution, Industry, and Private Funds

Most of URI's research funds come from federal and state governments. In the 1980's, a small portion of URI's funding came from industry or foundations. Institutional support for research peaked in 1990, and fell to 12.5% of the peak by 1998 (fig. 4). Research expenditures in 1998 were approximately the same as in the early 1980's.

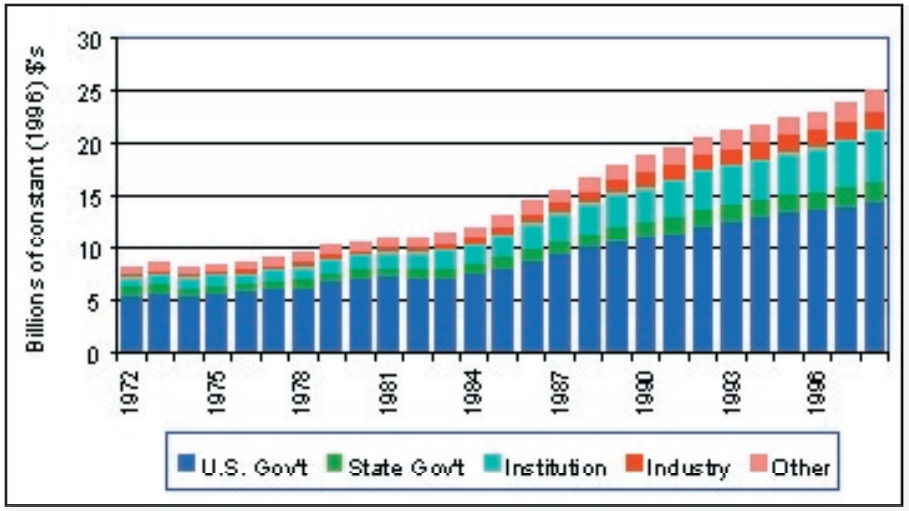

Figure 3. Total academic research expenditures in the US by funding source, in constant (1996) dollars, 1972 to 1998. Source: NSF, WebCas-

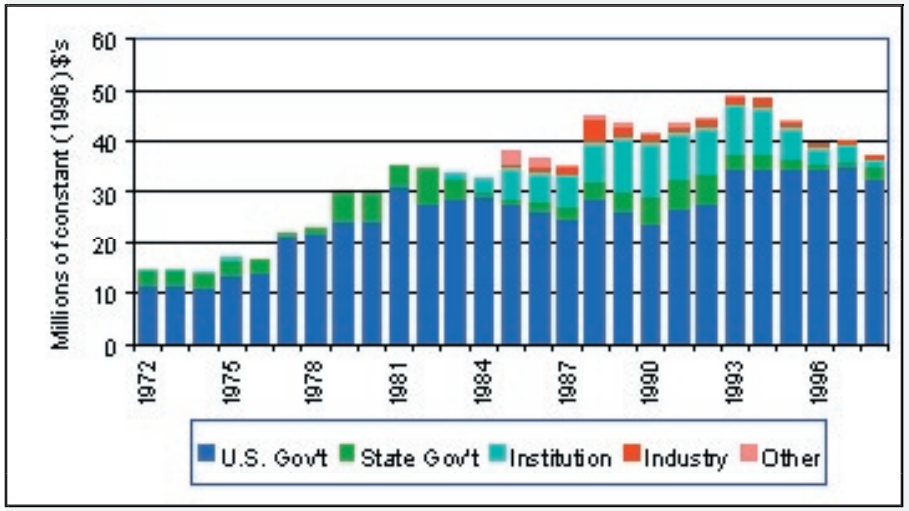

Figure 4. Total research expenditures at URI by funding source, in constant (1996) dollars, 1972 to 1998. Source: NSF WebCaspar.

Does Investment in Research Matter?

Each decade since 1960, Rhode Island per capita income has fallen further behind income in Connecticut or Massachusetts. Today, Rhode Island income is ~$6475 less than per capita income in Connecticut, and $9750 less than in Massachusetts (fig. 5).

The higher per capita incomes of Connecticut and Massachusetts, compared to Rhode Island, may be causally related to expenditures for research at MIT, Harvard, Yale, and their other large research universities (fig. 6).

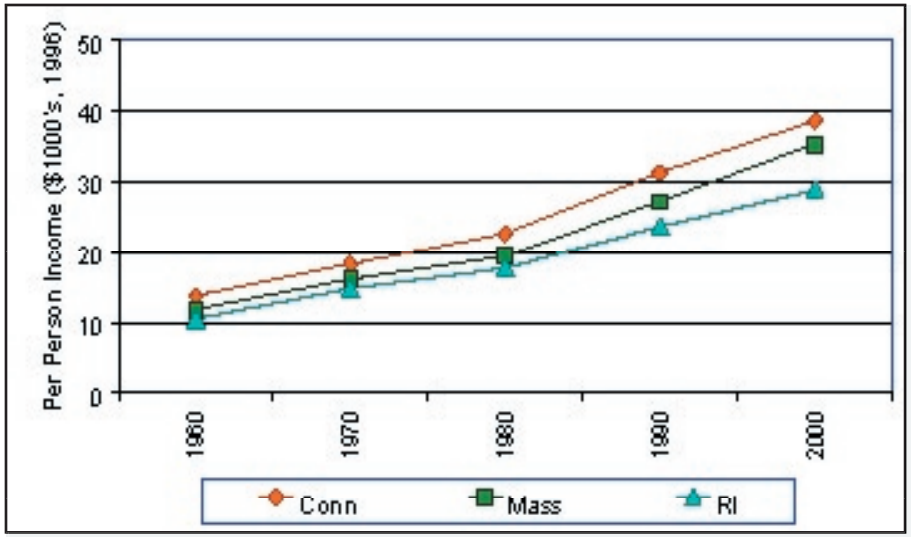

Figure 5. Since 1960, per capita income has risen faster in Connecticut and Massachusetts than in Rhode Island (2000 estimated). Source: US Census.

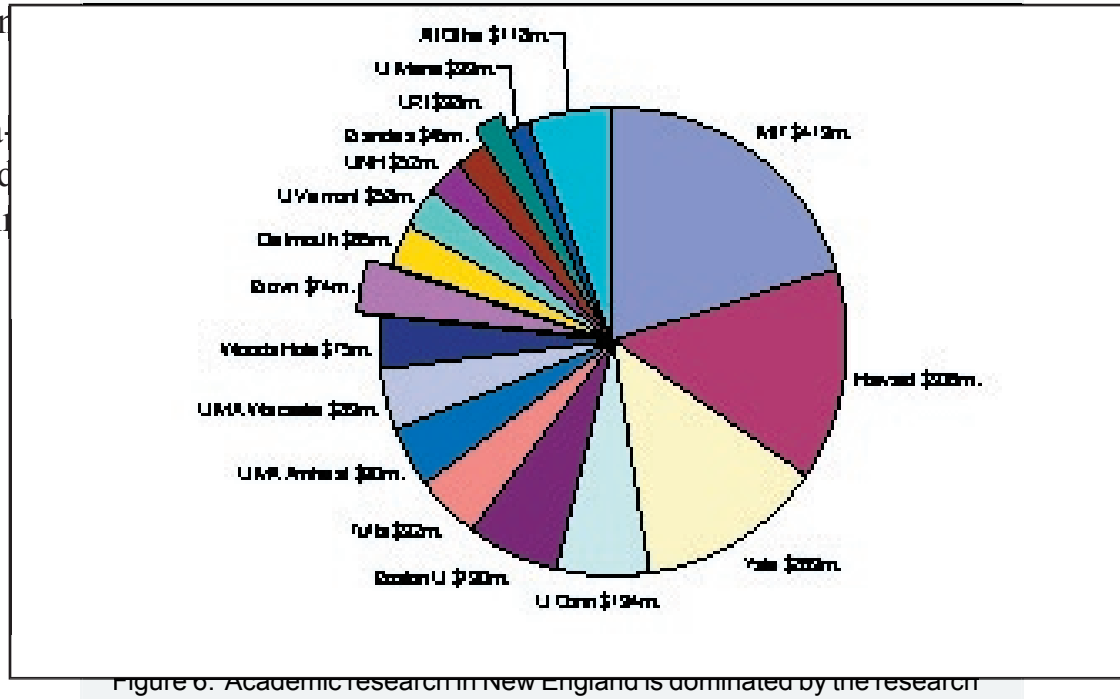

Figure 6. Academic research in New England is dominated by the research universities of Connecticut and Massachusetts. Source: AAAS, 2000.

Targeting Research Investment

American's know that research and innovation are essential to success in a global economy (fig. 7). Not all research investments, however, lead directly to a more robust economy. Rhode Island ranked 10th nationally in the ratio of R&D expenditures to Gross State Product, much of this due to Newport's Naval Undersea Warfare Center.. NUWC holds >400 patents, but related manufacturing is mostly out-of-state, returning little to RI's economy.

Not all university training investments contribute to a better economy. RI produces twice as many college graduates as new jobs each year. Surplus graduates leave and contribute to the economies of other states. URI needs to emphasize production of graduates better prepared to become local entrepreneurs, prepared to contribute to local jobs creation.

The Slater Centers help University-affiliated innovators generate instate start-ups, the seeds of the new Rhode Island economy. The long-term success of the Centers depends significantly on URI research productivity.

There are three keys to effective links between URI and Rhode Island's economy.

- Preparing each class of graduating scientists, technicians, and engineers must involve a strategy to evolve rapidly to meet emerging needs of leading-edge businesses.
- Creating new entrepreneur graduates—selected and trained for success in highly competitive marketplaces—must become a campus priority.
- Nurturing new-economy business ventures by providing a working environment for win-win exchanges of technology and training must become part of university cul-

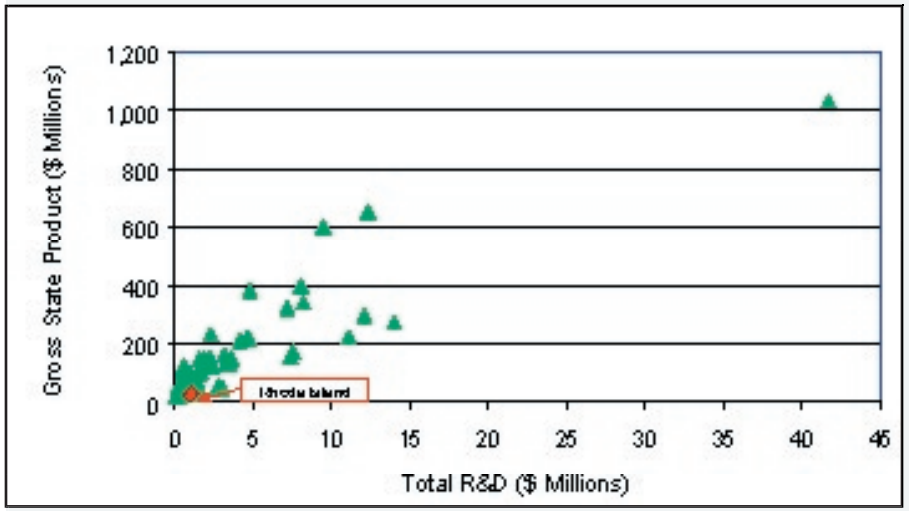

Figure 7. Relation between investment in research and development and state wealth, for 1997. Source: NSF, S&E Indicators 2000.

Targeting Internal Resource Investments

In 1992, the Graduate Council and the Council of Deans assessed the relation between graduate assistantship allocations and external research funds, graduate enrollment, undergraduate enrollment, and student credit hours. They decided that to selectively strengthen and build high-quality programs in graduate education and research, a process guided by a focus on URI's research mission, would require review of the allocation of graduate assistantships, with a view toward more equitable distribution, taking into account mission, teaching needs, research support needs and cost effectiveness. Underlying principles, promulgated by the Deans in 1995, include

- Experience in both classroom instruction and research is valuable for graduate students and appropriate for ... graduate assistants.
- Considering URI GA's in the aggregate, approximately two-thirds of their efforts should be devoted to instructional related activities and approximately one-third to research activities.

A fresh analysis of targeted investment of internal resources for purposes of strengthening research would indicate whether these principles are being followed, i.e., whether GA's (fig. 8) or departmental operating funds (fig. 9), (or asset protection funds, etc., not illustrated) are currently being used strategically to stimulate targeted research initiatives.

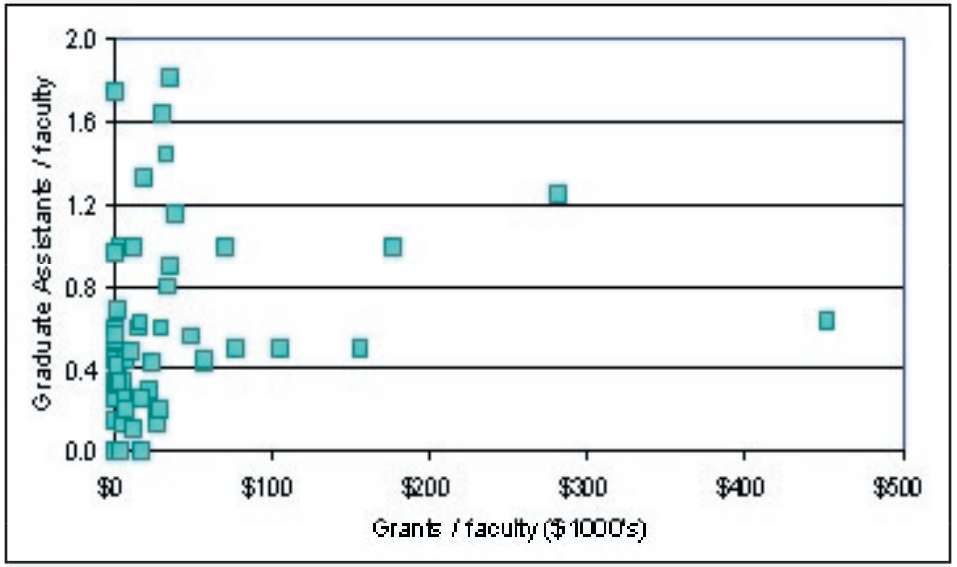

Fig. 8. Allocation of URI graduate assistants in relation to external grant activity, measured as grant funds / faculty. Grants estimated from average awards, 1992-1994; GA allocations from 1994.

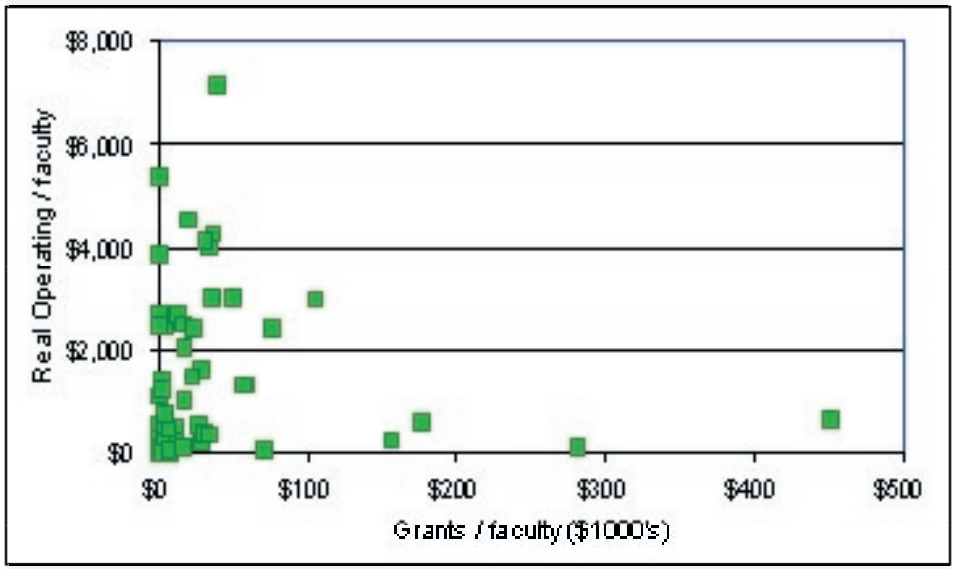

Fig. 9. Allocation of URI departmental operating funds (excluding telephones and postage) in relation to external grant activity, measured as grant funds / faculty. Grants estimated from average awards, 1992-1994; Operating funds from URI Controller

ture.

Toward a Strategic Plan for Funding Research

Research at URI depends on continued success in external competitive funding arenas. Nearly 90% of external grants are from federal sources. Competition for federal grants will get tougher as agency budgets flatten and as competing academic institutions employ greater and greater state, university, and private funds to build sophisticated infrastructure and staff. URI will need more than the intelligence of faculty and their willingness of work extraordinarily hard to secure grants.

There is great interest in state government in doing something to improve the state's economy. The State has established prototype Slater Centers of Excellence to serve as conduits of university intellectual properties into the Rhode Island economy. It is now openly focussing its attention on reinvigorating the research output of URI, as a reliable and consistent source of new ideas and patents to feed the Centers.

URI must be receptive to this opportunity to develop new partnerships within state government, and with industries and start-up companies through the facilitation of state government. It must demonstrate that research productivity is an institutional priority, through targeted investments and policies based on relevant principles. It must show that the institution has the competency and will to return on investments of new funds from the State and the private sector.

Sources:
These notes are for discussion by the Research and Outreach Strategic Planning Committee. Complete references to source materials to anyone who inquires: mayfly@!uri.edu..

Pat Logan is a Professor of Entomology. He has served as Associate Director and Director of the RI Agricultural Experiment Station, Associate Dean of the College of Resource Development (now CELS), Director of RI Cooperative Extension, and is a current member of the Board of Directors of the Slater Center of Excellence in Environmental Biotechnology. He has studied URI, state, and federal research policy and funding assiduously since 1984.