

"SPACE SCIENCE IN THE 1990'S AND BEYOND"

by

N95- 14634

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**ABSTRACT**

NASA's Office of Space Science is changing its approach to our missions, both current and future. Budget realities are necessitating that we change the way we do business and the way we look at our role in the Federal Government. These challenges are being met by a new and innovative approach that focuses on achieving a balanced world-class space science program that requires less resources while providing an enhanced role for technology and education as integral components of our Research and Development (R&D) programs.

**INTRODUCTION**

These are exciting times in Space Science. This is a time when the national environment is causing us to rethink many of the fundamental assumptions we've made about Space Science and adjust our program to accommodate to new realities and expectations. In fact, that's what this era in NASA and Government is all about -- adjusting to new realities and expectations.

Space science is in the process of pulling together a new strategic plan, one that is fully integrated into the Agency's new overall strategic plan, and one that brings us forward from the old space science plan that was hashed out at Woods Hole, Massachusetts, in 1991.

A key component of our new strategy is a greater reliance on our industry and research partners. These bold new partnerships are an outgrowth of the Clinton Administration's new priorities and the changing budget environment facing the Federal Government.

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They reflect the new reality confronting us all: we must work together and rely on each other more than ever to achieve our goals. Together we are forging a new approach to space exploration that will likely mean the difference between failure and success.

**CHANGING BUDGET ENVIRONMENT**

The world in which we operate has changed significantly since 1991, and now instead of arguing over how to divide up an ever-increasing budget as it was then, the central issue facing space science now is how to trim our ambitions to deal with a declining projected budget. In the period from fiscal year (FY) 1986 through FY 1991, the space science budget experienced large growth from year to year. In fact, over that timeframe, the overall budget increased by almost 65 percent (in real year dollars). It was during this period of growth that most of our current major missions were approved.

But, things started changing just after Woods Hole. During the period 1992 through 1994, we experienced a transition -- from high growth to arrested growth. In the last few years, we have seen the cancellation of some, and the restructuring of most of our major missions, and we have seen additional losses in supporting programs like tracking and data handling which are so important to the overall success of our missions.

In addition, our plans for new missions have not been realized. When we met at Woods Hole almost 3 years ago, we laid out a new mission queue for space science -- one that was based on a more moderate rate of growth than we had experienced in the years immediately preceding 1991. We were basing our program planning on about 7 percent real growth. This

assumption was almost instantly proven incorrect. It is clear that a declining budget for NASA beyond FY 1995 is possible, though I am not ready to say that it is probable. But, in these tough fiscal times, the best we can realistically hope for is that the NASA budget will remain flat over the next few years.

### OTHER NASA PRIORITIES

Within NASA, there are a number of other high priorities that are also searching for outyear funding. The human space flight program, consisting of the Space Shuttle and Space Station, remains one of NASA's highest priorities, and there is concern that there is no cushion left in the Shuttle budget to accommodate further cuts without impacting safety. On top of that, funding is scheduled to increase over the next couple of years for two other high priority areas, namely the Mission to Planet Earth and Aeronautics programs, that are of particular interest to the Clinton administration. Given a flat budget for the agency and the desire to increase MTPE and Aeronautics, NASA is facing the likelihood that it will reduce funding in the area of space science.

### THE NEW REALITY

The fact is that the principal difference between the space science program of the past decade and the space program of the next decade is the economy. Not only is this new reality constraining the size of our appetites, it is conditioning the expectations of our ultimate customer, the American taxpayer.

The result then of a realistic assessment of the current economic environment yields the following:

- The total size of the Federal investment in R&D will probably not grow in real terms.
- Within NASA, while R&D may grow as a percentage of the budget, and some real growth might be expected in some areas (notably Earth Science and Aeronautics consistent with national emphasis on the environment and competitiveness), space science can expect a flat budget at best.

In addition, while the value of the space science program as an element of basic science will continue to be recognized, the expectations of the taxpayer will mandate a change in the way the business of space science is conducted with new emphasis on improvements in education and enhancement of competitiveness.

### THREE-PRONGED APPROACH

As a direct response to this new economic reality and new expectations, the Office of Space Science has embarked upon the development of a new strategy for space science that now comes in three parts:

1. A mission/program strategy that continues discovery, exploration, and expansion of knowledge, and provides inspiration and vision, but does it with an emphasis on doing "more with less" and doing missions that are "smaller, quicker and cheaper;"
2. An integrated technology strategy that provides for the formulation of a partnership between the Office of Space Science and Office of Advanced Concepts and Technology (OACT) in achieving national objectives for the development and transfer of technologies to industry; and,
3. An integrated education strategy that provides for a partnership between the Office of Space Science and NASA's Office of Education in achieving national objectives for improving science and math literacy by taking advantage of characteristics intrinsic to the space science programs and its participants.

I would like to say a few words about our current activities and emphasis in each of these three strategic thrust areas.

### PROGRAMMATIC STRATEGY

With respect to our program strategy, our focus has been on adjusting the ongoing program to accomplish two objectives:

- 1) Complete as much as can be afforded
- 2) Make room for new initiatives

To date, our efforts have focused on adjusting the Advanced X-ray Astrophysics Facility (AXAF) and Cassini missions, where we've managed to delete 30 percent of the development cost to go on both missions and more than 50 percent of the projected operations cost on AXAF. In the near future, we will be reviewing the Jet Propulsion Laboratory (JPL) response to our challenge to reduce Mission Operations and Data Analysis (MO&DA) cost for Cassini by 50 percent.

While we have suffered some setbacks in recent years, notably the loss of the Comet Rendezvous Asteroid Flyby (CRAF) mission and the spectroscopy portion (AXAF-S) of the original AXAF mission, we hope to recover much of what was lost through cooperative efforts with Europe and Japan, respectively.

In addition to these adjustments, we have been modifying our strategy for other missions, not yet contained in our program runout, in order to make them more digestible. For example, the Thermosphere, Ionosphere, Mesosphere Energetics and Dynamics or TIMED mission has been restructured from billion dollar class down to Explorer class, while the Pluto flyby and the Space Infrared Telescope Facility or SIRTF missions are now down to one-half billion-class.

### TECHNOLOGY'S ROLE

I want to make it clear that when I am talking about lower cost spacecraft in the context of space science, I do not mean lower cost because we use off-the-shelf hardware. There may be good reasons to go this route if you are operationally oriented, and use spacecraft only as means to some application -- such as communications, weather, or environmental applications. But if you believe that you are a pioneer, an explorer, a developer, then I believe this is precisely the wrong approach to lower the cost of a spacecraft. If you are a pioneer and a developer, then you want to be at the frontier of technology, constantly pushing at the edge to get more capability for less cost.

There is a mentality in the aerospace business which says that low cost necessarily means off-the-shelf because new technology implies high risk or high cost or both. This is one of those mind sets that creeps into an aging,

conservative enterprise and becomes dogma. I believe it is wrong. To allay the fear of using new technology, it is only necessary to assure that you have done enough testing to be ready to take prudent risk in utilizing it. The extra cost that it may take in testing new technology should be more than balanced by the savings this new technology enables in the development phase.

In space science we can no longer afford to be conservative if we are to survive. We have to inject additional life and excitement into what we are doing. In my opinion, building spacecraft and instruments out of tinker toys from a box off the shelf is not what NASA was intended to be. Developing new technology, pushing to the edge of what is thought possible, that is what NASA was intended to be.

In the U.S., we have to provide the Nation -- our customer -- what it wants, and our public needs to perceive that NASA is pushing the frontiers of science and technology and taking prudent risks for major gain. That is why the public has always admired NASA and it is what made NASA stand out from other parts of the Government that are overly mired in the issues of today rather than the promise of tomorrow. If there is no excitement or adventure in what we do, if we are not expanding physical and technological horizons, then NASA will be perceived as uninspiring and nothing more than a burden on the taxpayer.

We in space science need to be developers again, not just assemblers. We need to once again believe in our own ability to take prudent risk and to try the hard things. We need not to be afraid to try new technology. In fact, we should and are seeking the opportunity to do more to assist the Nation in the search for new and better technologies.

### TECHNOLOGY STRATEGY

In our efforts to play a more active role in technology, the Office of Space Science recently completed an Integrated Technology Strategy. This strategy identifies four goals for space science to accomplish in partnership with NASA's Office of Advanced Concepts and Technology or OACT:

- 1) Identification and support of promising new technologies with emphasis on dual use (Government and private sector);
- 2) Infusion of technologies into space science programs in the interest of more efficient and effective science but also using science missions as a technology validation mechanism;
- 3) Transfer of technologies to the private sector, and,
- 4) Development of partnerships among industry, academia and Government to serve both Space Science and private needs

There are ongoing activities in each of these areas. They include the flight of a commercially provided gyro on the X-ray Timing Explorer (XTE), using XTE as a flight testbed.

Mars Pathfinder will serve as a science and engineering test of the entry, descent, landing, and deployment systems for future small Mars landers. It will combine rough landing techniques developed by the former Soviet Union and the U.S. defense industry with safety ideas derived from the U.S. auto industry. The Mars Pathfinder delivery system will consist of an aeroshell, a parachute, a set of very small retro rockets, and inflatable airbags that deflate after impact on the surface.

Pathfinder's micro-rover technology will open new windows on space exploration by using microtechnology, automation, and advances in thermal control technologies. The Mars Pathfinder micro-rover design combines mobility with sensory perception; it will "see, touch, taste and smell" for us on the surface of Mars. The 40-minute message "trip time" from Earth to Mars makes autonomous operation of the micro-rover mandatory. Three-dimensional images of the Martian landscape will be sent to Earth. Proposed micro-rover routes will then be relayed back to the micro-rover, which will then carry out its instructions as planned. The micro-rover will be equipped to handle unexpected circumstances, including the use of autonomous "if-then" scenarios to avoid obstacles and unforeseen problems. In the future, we hope to build on what we learn with

the Mars Pathfinder micro-rover to develop even more advanced rovers with increased autonomy and versatility that could be used for sample collection and instrument deployment.

There is also the example of the partnership between Caltech/JPL, NASA and Cray Computers in the development of commercially useful applications on Cray's new generation of massively parallel processors.

### EDUCATION STRATEGY

Our education strategy is in its formative stages but it's already apparent that it will also articulate a new way of doing business. It will call for a partnership between Space Science and NASA's Office of Education in achieving NASA's objectives in support of the national education goals first articulated by the Federal Coordinating Council on Science, Engineering and Technology (FCCSET), Committee on Education and Human Resources and now in preparation by the National Science and Technology Council (NSTC) Committee on Education and Training. It will put renewed emphasis on kindergarten through 12th grade education and on the use of technology to broaden the impact of space science education efforts.

### RECENT EVENTS

So, in every instance activities are underway to achieve a new vision for space science. I'm pleased to say that it has already shown results. In the FY 1994 budget, the Discovery program was initiated with the Near Earth Asteroid Rendezvous (NEAR) and the Mars Pathfinder missions, but I believe the FY 1995 budget reflects a true endorsement of the new space science approach with the initiation of the Mars Surveyor Program.

The program is built around the principal of distributed risk and frequent access. It requires a technology investment in order to achieve its low cost and scientific objectives. It will take advantage of industrial capabilities to the extent that they exist and require participation of the private sector for technology transfer and an educational initiative for each element. I believe that the inclusion of this initiative in the President's proposed FY 1995 budget is an endorsement of the new way of doing business

in space science. I am convinced that if the Congress echoes that endorsement, we in NASA's Office of Space Science as well as our partners in the space science community, are committed to reshaping all of space science for the future.

### OUTLOOK

So, specifically, what are the strategic priorities for space science over the next decade? What can we realistically hope to accomplish given our new outlook?

The cornerstones of our approach in the Office of Space Science will include the following:

- 1) Our highest priority will continue to be the completion of missions currently operating or under development. We will establish a renewed commitment to living within defined cost and performance envelopes, while realizing the full science potential of our existing missions.
- 2) Where feasible, we will initiate new programs of modest size to maintain U.S. leadership in space science and to continue the rate of discovery and knowledge.

To achieve this first priority we must foster a renewed commitment to a program management discipline that requires us live within defined cost and performance envelopes. Failure to abide by this new cost ethic will be the death of our programs, especially with NASA's new program management directives which mandate a formal Administrator-level review whenever a program overruns its initial cost estimate by 15 percent.

Our strategy for future additions to space science will clearly emphasize small missions which will enable frequent access to space for continued exploration and discovery. Our future plan will be to:

- 1) Maintain the Explorer program;
- 2) Add the continuation of the Discovery Series; and
- 3) Initiate the Solar-Terrestrial Probe Series

We currently have approval for only the first two Discovery missions -- we must have this important new approach to planetary missions

sustained as an on-going, level-of-effort program. We will be working to get approval to launch Discovery follow-on missions (using Delta or smaller expendable launch vehicles) every 12 to 15 months within cost-capped development program of \$150 million (in FY1992 dollars) or less per mission. The announcement of opportunity or AO for the third Discovery mission has been released in draft, and we anticipate releasing the formal AO next month.

In the case of the Explorer program, we will be releasing the AO for the next set of Small Explorers later this year. We are moving forward with both of these programs and we will be working to make sure they continue into the future.

While it is not in our 1995 budget request, the Solar-Terrestrial Probes program remains the highest priority for a new start in the outyears. We hope to move forward with this program as early as next year, should funding permit. We hope to launch a series of three Solar Terrestrial Probes by 2001, each with development costs of less than \$100 million.

The proposed Mars Surveyor program I mentioned before calls for a start in 1995 of development for a small orbiter that will be launched in November 1996 to study the surface of the Red Planet. This new Mars Surveyor program be an aggressive series of orbiters and landers that will take advantage of launch opportunities about every 2 years as Mars comes into alignment with Earth. The first orbiter will be small enough to be launched on a Delta II and will carry roughly half of the science payload that flew on Mars Observer. Future orbiters and landers will be even smaller, making possible launches on the new Med-lite launch vehicle.

All three of these programs provide a strong base of science, a constant stream of important data, that will serve to maintain the space science research base of our country far into the next century.

We must also provide for major advances in the frontiers of space science. By this I mean that we hope to start an Infrared Astronomy Initiative that would encompass the Stratospheric Observatory for Infrared

Astronomy (SOFLA) and what used to be called the Space Infrared Telescope Facility (SIRTF). We will also be looking to start a Pluto Fast Flyby mission to complete the reconnaissance of the solar system, and a Solar Probe program to complete the reconnaissance of the Sun.

In this regard, we have already agreed to jointly study future Mars, Pluto and Solar Probe missions with the Russians and we will be contacting other nations to foster further discussions for international collaboration on these important missions.

Which brings up another important pillar of our strategic planning, namely, that we must, now more than ever, leverage our investments in space science through international cooperation. Throughout the history of space science, about 70 to 80 percent of our missions have had some sort of international component. In the 1990s and beyond, we need to build on that strong historical base and take advantage of new opportunities to improve scientific return of NASA missions through international cooperation (determined by foreign agency priority and funding availability).

The realities of the 1990s are that all spacefaring nations are struggling to maintain their programs in these difficult economic times. We must work together if we are to succeed.

Just as an example, we formed the International Mars Exploration Working group (IMEWG) last year. The charter of this group is to serve as discussion forum for various nations interested in Mars exploration. Its goal is to keep everyone informed so that we can avoid duplication of effort and discuss potential areas for collaboration/cooperation on Mars exploration. It is developing into a strong mechanism for exchanging ideas and information, and may well facilitate actual cooperation over the long-run. We have already had two meetings, and we expect that the first recommendations on an international strategy for Mars exploration and a future International Mars Network will be presented to the Committee on Space Research or COSPAR in July 1994.

## CONCLUSION

Already, just as our new approach is coming together, we see some positive signs. The FY 1995 budget request is a good first step. I believe the real success of our new strategy will be measured with the start of missions originally conceived as \$1 billion plus missions in the past, but are currently reconstituted to fit new economic constraints and yet signal our intention not to relinquish our leadership in Astronomy and Outer Planet Exploration. While the task may seem daunting, there are clear signs of encouragement from many quarters, both within and outside of NASA. I think we have accomplished a lot already in circumstances that, at the time, appeared very grim. The 1995 Budget is a good budget for space science and I am looking forward to equally good budgets in the future.

In closing, I just want to reiterate that while we do have some challenges before us, space science clearly has a future. By working with our industry and research partners, and by being innovative in our thinking, we can make that future especially bright. Our future lies in a common approach, one that brings all of America's best and brightest groups together. The old ways of getting the job done are not consistent with the new and emerging world we live in. NASA has always been at the forefront -- to remain there we must and will change.



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THE BUSINESS ROUNDTABLE  
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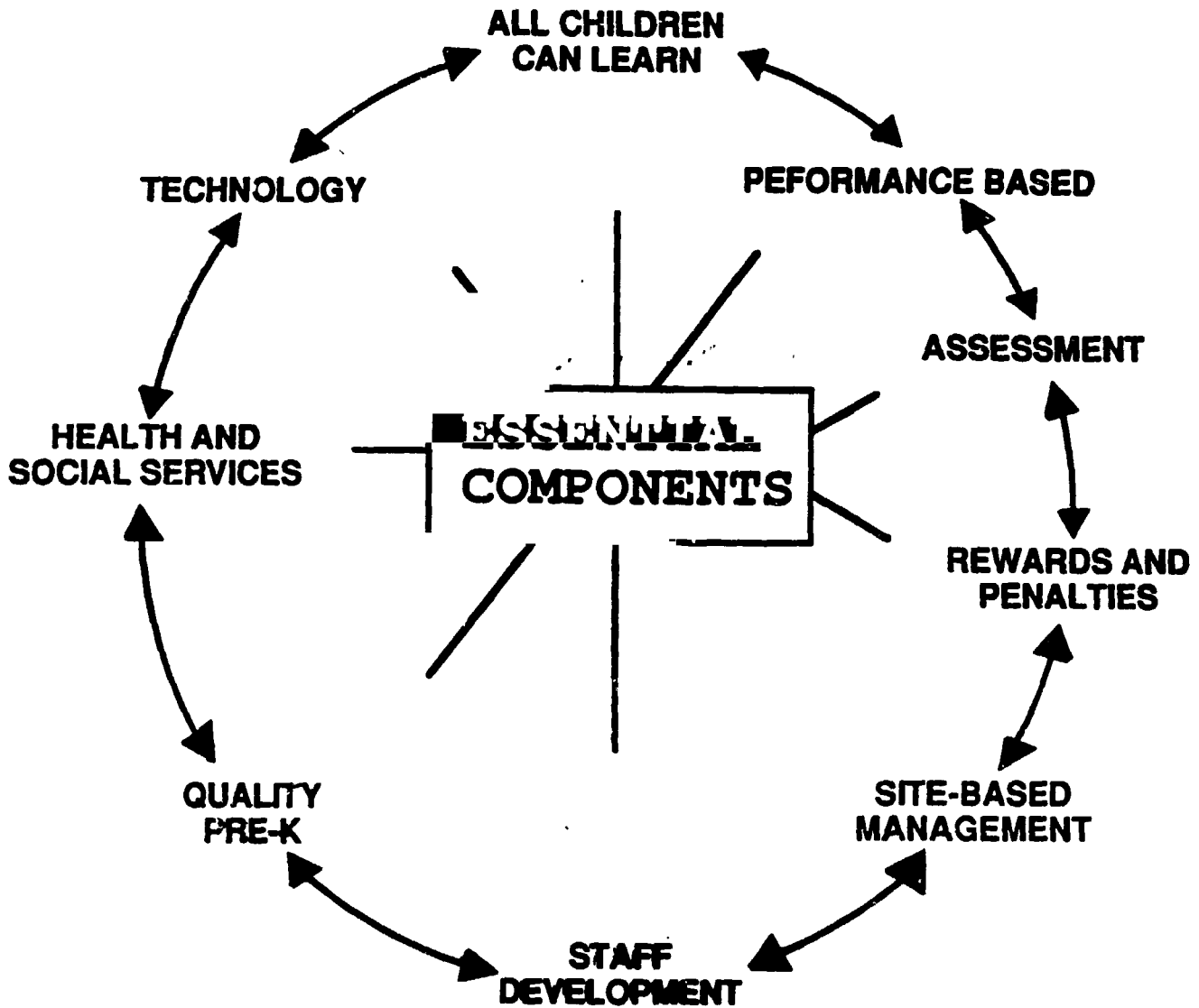
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# The Systemic Solution





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# The Roundtable Education Status 1994

- Launched September 26, 1989
- 180 CEOs
- Activity:
  - 29 States — Significant Activity
  - 13 States — Moderate Activity
  - 7 States — Little Activity

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# **National Education Goals For the Year 2000**

- **All the All the Children Will Start School Ready To Learn.**
- **The High School Graduation Rate Will Increase To At Least 90 Percent.**
- **Students Will Demonstrate In the Fourth, Eighth And Twelfth Grades That They Can Handle Such Subject Matter As English, Mathematics, Science, History And Geography; Every School Will Make Sure Its Students Learn to Use Their Minds Well So They Will Be Ready For Responsible Citizenship, Further Learning, And Productive Employment.**

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# **National Education Goals For the Year 2000 (Continued)**

- **American Students Will Rank First In Mathematics And Science.**
- **Every Adult American Will Be Literate, With The Knowledge And Skills To Compete In A Global Economy And Exercise The Rights And Responsibilities Of Citizenship.**
- **Every School Will Be Free Of Drugs And Violence And Offer A Disciplined Environment Conducive To Learning.**

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# **The Business Roundtable Education Initiative**

## **Mission**

- **CEO-Led, 50-State, Decade-Long Initiative**
- **Join or Establish a Coalition with Governors and Others**
- **Develop and Implement a Public Policy Agenda to Achieve the National Education Goals**
- **Address all Essential Components of a Successful Education System**
- **Provide Ongoing Education, Publications, State Assistance**

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# History

- **June 5, 1989:** Annual Roundtable Meeting  
Presidential Challenge
- **September 26, 1989:** Response to the President
- **September 27-29:** White House Summit with the  
Governors in Charlottesville
- **February 25, 1990:** NGA Announces National Goals
- **Spring 1993:** Reform Legislation Enacted in Ohio,  
Missouri and Washington
- **Summer 1993:** Reform Act Signed in Massachusetts

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# **The Business Roundtable Education Task Force Membership**

**Joseph T. Gorman, Chairman  
TRW, Inc.**

**Paul A. Allaire  
Xerox Corporation**

**Rand Araskog  
ITT Corporation**

**John L. Clendenin  
BellSouth Corporation**

**John J. Curley  
Gannett Co., Inc.**

**Joseph L. Dionne  
McGraw-Hill, Inc.**

**Walter Y. Elisha  
Spring Industries, Inc.**

**Richard B. Fisher  
Morgan Stanley Group**

**H. Laurance Fuller  
Amoco Corporation**

**Gaynor N. Kelley  
Perkin-Elmer Corporation**

**Robert D. Kennedy  
Union Carbide Corporation**

**Reuben Mark  
Colgate-Palmolive Company**

**Joseph Neubauer  
ARA Services, Inc.**

**Paul H. O'Neill  
Aluminum Company of America**

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# **The Business Roundtable Education Task Force Membership**

**James Orr III  
UNUM Corporation**

**Joseph Pichler  
The Kroger Company**

**Henry B. Schacht  
Cummins Engine Co., Inc.**

**Richard Sharp  
Circuit City Stores, Inc.**

**Donald J. Shuenke  
Northwestern Mutual Life Ins. Co.**

**Charles Shoemate  
CPC International, Inc.**

**Frank A. Shrontz  
The Boeing Company**

**A. J. C. Smith  
Marsh & McLennan  
Companies**

**Raymond Smith  
BellAtlantic Corporation**

**Richard J. Stegmeir  
Unocal Corporation**

**W.T. Stephens  
Manville Corporation**

**Dennis Weatherstone  
J.P. Morgan & Company, Inc.**

**David Whitman  
Whirlpool Corporation**

**Stephen Wolf  
UAL Corporation**

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## **Definition of the Problem**

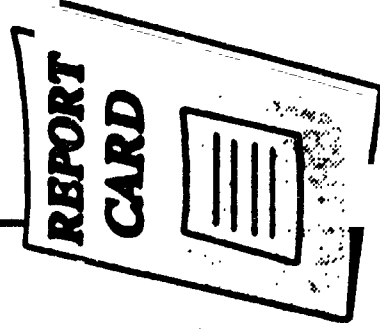
**The Education System has not changed for almost 100 years. Many people know what needs to be done to increase student achievement across the board, yet the system remains resistant to change. The question is, how do we get the change to happen?**



# REALITY GAP: STUDENTS, PARENTS AND EMPLOYERS DISAGREE

## POSITIVE RATINGS OF STUDENTS SKILL (%)

| Skill                   | Students | Parents | Employers |
|-------------------------|----------|---------|-----------|
| Read well               | 78       | 67      | 30        |
| Write well              | 66       | 56      | 12        |
| Know math               | 71       | 65      | 22        |
| Understand instructions | 78       | 70      | 33        |
| Solve complex problems  | 57       | 48      | 10        |
| Motivated to work well  | 69       | 69      | 25        |
| Dedication to work      | 73       | 67      | 20        |
| Disciplined work habits | 70       | 54      | 19        |

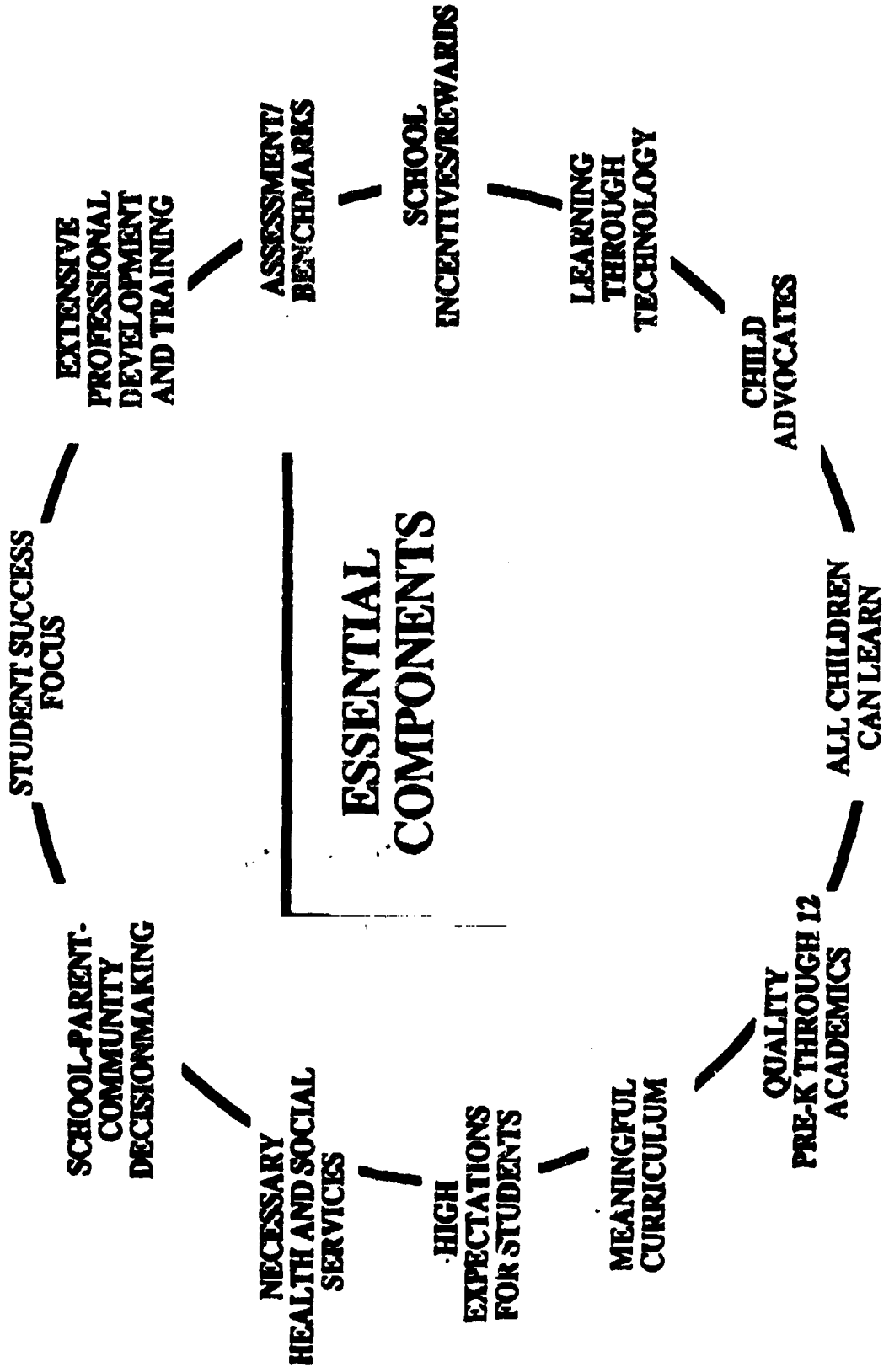


SOURCE: Committee for Economic Development

✓ Students and their parents feel that high school graduates are entering the workforce with the necessary academic skills to succeed on the job.

✓ Employers take nearly the opposite view.

# COMPREHENSIVE CHANGE



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# International Comparisons

## Age 13 Science 1991

|                |      |                  |      |
|----------------|------|------------------|------|
| 1. Switzerland | 70.8 | 6. Spain         | 67.6 |
| 2. Italy       | 69.9 | 7. United States | 67.0 |
| 3. Canada      | 68.8 | 8. Ireland       | 63.3 |
| 4. France      | 68.6 | 9. Portugal      | 62.6 |
| 5. Scotland    | 67.9 |                  |      |

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# International Comparisons

## Age 13 Math 1991

|                |      |                  |      |
|----------------|------|------------------|------|
| 1. Switzerland | 70.8 | 6. England       | 60.6 |
| 2. France      | 64.2 | 7. Ireland       | 60.5 |
| 3. Italy       | 64.0 | 8. Spain         | 55.4 |
| 4. Canada      | 62.0 | 9. United States | 55.3 |
| 5. Scotland    | 60.6 | 10. Portugal     | 48.3 |

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# International Comparisons

## Graduation Rank From Upper Secondary School

- |                       |                           |
|-----------------------|---------------------------|
| <b>1. Finland</b>     | <b>8. Austria</b>         |
| <b>2. Denmark</b>     | <b>9. Netherlands</b>     |
| <b>3. Japan</b>       | <b>10. Sweden</b>         |
| <b>4. Norway</b>      | <b>11. France</b>         |
| <b>5. CSFR</b>        | <b>12. Ireland</b>        |
| <b>6. Hungary</b>     | <b>13. United Kingdom</b> |
| <b>7. Switzerland</b> | <b>14. United States</b>  |
|                       | <b>15. Canada</b>         |

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# International Comparisons

## Age 14 Reading 1991

|                       |            |                         |            |
|-----------------------|------------|-------------------------|------------|
| <b>1. Finland</b>     | <b>545</b> | <b>6. Iceland</b>       | <b>514</b> |
| <b>2. France</b>      | <b>531</b> | <b>7. United States</b> | <b>514</b> |
| <b>3. Sweden</b>      | <b>529</b> | <b>8. Germany</b>       | <b>501</b> |
| <b>4. New Zealand</b> | <b>528</b> | <b>9. Denmark</b>       | <b>500</b> |
| <b>5. Switzerland</b> | <b>515</b> | <b>10. Portugal</b>     | <b>500</b> |

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# Demographic Data

- **2010 Growth (Under 18)**
  - **Non-White Up 4.4 Million and Whites Down 3.8 Million**
  - **8 Million Immigrants in 1990s from:**
    - Mexico
    - India
    - China
    - Philippines
    - Cuba
    - Jamaica
    - Korea
    - D.R.
    - Canada
- **1990 - 2000 Population Growth**
  - **0-4 Years = -9%**
  - **100+ = +170%**
  - **210 People Per Week Reach 100!**

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## **Demographic Data**

- **Rate of Incarceration - U.S. 1980 - 1990:  
82% Are High School Drop Outs and Cost \$20,000  
Per Year**
- **Two Million Children Are Not Being Raised by Either  
Parent  
- 450,000 by Grandparents**
- **20% of 1986 College Graduates Obtained Jobs Requiring  
No College Training**



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## **Demographic Data**

**• In California by 1995, 52.1% of High School Graduate Will Be Minority**

**- 41% Increase in Total Number of Kids by 2000**

**• 1980 - 1990 Growth**

**U.S. 9.8%**

**White 6.0%**

**Black 13.25%**

**Asian 107.8%**

**Hispanic 53.6%**

**• In 1992, More Muslims than Episcopalians**

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## Demographic Data

- **Percentage of Population under 18:**

|             |            |
|-------------|------------|
| <b>1970</b> | <b>34%</b> |
| <b>1990</b> | <b>26%</b> |
| <b>2000</b> | <b>25%</b> |

- **1980 - 1990:**

- 17% Increase in Couples Without Children**
- 1% Increase in Couples With Children**

- **Number of Prisoners in U.S. 1980 - 1990:**

|             |                  |
|-------------|------------------|
| <b>1980</b> | <b>466,371</b>   |
| <b>1990</b> | <b>1,115,111</b> |

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# United States of America Background Information

**Percent Children Not Living  
With A Parent**

**4.3%  
1990**

**Percent Population Under  
Age 18 That Is Minority**

**30.9%  
1990**

**Percent Of Children With Both  
Or Only Parent In The Labor Force**

**61.0%  
1990**

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# United States of America Background Information (cont'd)

| Indicators                                    | Percent Change | Trend Data: |      |
|---|----------------|-------------|------|
|   | Over Time      | 1980        | 1990 |
| Percent Children in Poverty                   | 22% Worse      | 16.0        | 19.5 |
| Percent Children in<br>Single Parent Families | 13% Worse      | 21.3        | 24.1 |

# **Current Public Expenditures for Education, by Country: School Year 1988-89**

|                      | <b>As a percent of GDP</b> | <b>Constant 1988-89<br/>U.S. dollars</b> |
|----------------------|----------------------------|--|
| <b>Canada</b>        | <b>3.8</b>                 | <b>3,508</b>                             |
| <b>Denmark</b>       | <b>4.5</b>                 | <b>4,035</b>                             |
| <b>Finland</b>       | <b>4.1</b>                 | <b>3,638</b>                             |
| <b>Ireland</b>       | <b>3.8</b>                 | <b>1,473</b>                             |
| <b>Luxembourg</b>    | <b>4.0</b>                 | <b>4,911</b>                             |
| <b>Norway</b>        | <b>4.3</b>                 | <b>3,846</b>                             |
| <b>Sweden</b>        | <b>4.4</b>                 | <b>4,600</b>                             |
| <b>Switzerland</b>   | <b>3.7</b>                 | <b>4,737</b>                             |
| <b>United States</b> | <b>3.4</b>                 | <b>3,917</b>                             |

---

# **The Strategy For Putting The Nine Points In Place Is Dictated By Two Forces**

**Practical Considerations**

**Political Considerations**

---

**Because Of The Relationship Of  
Each Of The Nine Points To Others**

**All Of Them Must Be In  
Place For The System To Work**

---

## **Lessons Learned**

- **Need New Model For Business Involvement: Long-Term, Systematic, Political**
- **Educate Ourselves First, Then Approach Stakeholders**
- **Defining A Vision Is Easier Than Developing A Strategy**
- **Stick To The Agenda**
- **Start With Your Corporation**



---

## **Communication Objective**

- **To humanize the problem of America's failure to adequately develop its children and to motivate citizens to take action**

---

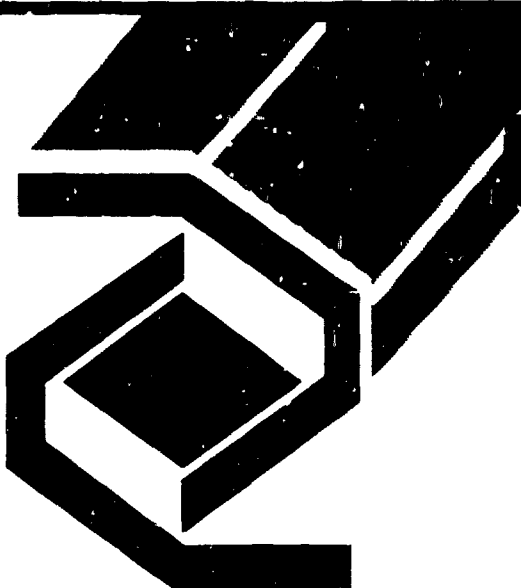
# Challenges

- **Hope vs Helplessness**
- **Individual Responsibility vs Collective Responsibility**
- **Them vs Us**

---

# Challenges

- "Jolt" the disinterested into concern
- Remind ordinary Americans of their ability to accomplish extraordinary things



# TABES 94

10th Annual

**Technical and Business  
Exhibition and Symposium**

**May 10 - 11, 1994  
Von Braun Civic Center  
Huntsville, Alabama**

## TECHNOLOGY REINVESTMENT PROJECT

BY

**DR. H. LEE BUCHANAN  
ADVANCED RESEARCH PROJECTS  
DEFENSE SCIENCE OFFICE  
3701 N FAIRFAX DRIVE  
ARLINGTON, VA 22203-1414**

**TABES Paper  
No. 94 - 402**

TABES Sponsored Annually by

## **Huntsville Association of Technical Societies**

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**TECHNOLOGY REINVESTMENT  
PROJECT  
DEPLOYMENT ACTIVITY AREAS**

**LESSONS LEARNED WORKSHOPS  
PRESENTATION MATERIALS  
AND  
FINAL ATTENDANCE LISTS**

**OAKLAND, CA, MARCH 2, 1994  
AND  
ATLANTA, GA, MARCH 9, 1994**

**MARCH 28, 1994**

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**Agenda for Oakland and Atlanta**

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**Manufacturing Extension Partnership Management Regions**

**Data on Selection and Selected Proposals and Outcomes of the Selection Process**

**Selection Process and Criteria**

**Key Issues of Content**

**Key Issues of the Process**

**Partnerships**

**Example - Georgia Manufacturing Technology Extension Center**

**Breakout Sessions**

- **Manufacturing Extension Service Providers**
- **Extension Enabling Services**
- **Technology Access Services**
- **Alternative Deployment Pilot Projects**

**Final Attendance Lists for Oakland and Atlanta**

**List of Others Receiving Proceedings**

**Agenda**  
**for**  
**Oakland and Atlanta**

# TECHNOLOGY REINVESTMENT PROJECT DEPLOYMENT ACTIVITY AREAS

## Lessons Learned Workshop

University of California  
300 Lakeside Drive  
Oakland, CA  
March 2, 1994

*There will be opportunities for questions in limited numbers during the morning session. The afternoon break-out sessions are designed to address questions in depth, and ample time is allowed in the afternoon sessions for such discussions.*

- |   |   |                 |
|---|---|-----------------|
| 8:00 - 9:00 am  | Registration - Kaiser Center, Auditorium, 2nd Floor   |                 |
| 9:00 - 9:30 am  | Welcome   | Calvin Moore    |
| 9:30 - 9:45 am  | Data on selection and selected proposals<br>Outcomes of the selection process   | Frank Penaranda |
| 9:45 - 9:55 am  | Selection Process and Criteria  | Phil Nanzetta   |
| 10:15 - 10:30 am  | Key Issues of Process <ul style="list-style-type: none"><li>• Structure of the proposal</li><li>• Structure of the site visit</li></ul>   | Tom Starke      |
| <i>Very brief break by stretching in place - coffee available</i> |   |                 |
| 10:35 - 10:45 am  | Partnerships  | Frank Penaranda |
| 10:45 - 12:00 pm  | Three Examples <ul style="list-style-type: none"><li>• Georgia Manufacturing Technology Extension Center (MESP)</li><li>• Agile Web (ADPP)</li><li>• Iowa Metal Casting (EES)</li></ul> |                 |
| 12:00 - 1:00 pm   | Lunch   |                 |
| 1:00 - 4:00 pm  | Break-out Sessions (coffee available mid-afternoon)   |                 |
|   | • Manufacturing Extension Service Providers<br>(California Room)  | Phil Nanzetta   |
|   | • Extension Enabling Services<br>(Lakeview Club, Treffan Room)  | Frank Penaranda |
|   | • Technology Access Services<br>(Lake Merritt Hotel, Paramount Room)  | Tom Starke      |
|   | • Alternative Deployment Pilot Projects<br>(Auditorium)   | John Fenter     |



# Technology Reinvestment Project Deployment Activity Areas

## Lessons Learned Workshop

Georgia Tech Campus

Atlanta, GA

March 9, 1994

*There will be opportunities for questions in limited numbers during the morning session. The afternoon break-out sessions are designed to address questions in depth, and ample time is allowed in the afternoon sessions for such discussions.*

- 8:00 - 9:00 Registration - Theatre of the Arts Auditorium, Bldg. 63
- 9:00 - 9:30 Welcome Mike Kelly
- 9:30 - 9:45 Data on selection and selected proposals Frank Penaranda  
Outcomes of the selection process
- 9:45 - 9:55 Selection Process and Criteria Phil Nanzetta
- 9:55 - 10:15 Key Issues of Content Phil Nanzetta
- 10:15 - 10:35 Key issues of process Tom Starke  
- Structure of the proposal  
- Structure of the site visit
- Very brief break by stretching in place - Coffee available.*
- 10:35 - 10:45 Partnerships Frank Penaranda
- 10:45 - 12:00 Three Examples  
- Georgia Manufacturing Technology Extension Center (MESp)  
- Agile Web (ADPP)  
- Iowa Metal Casting (EES)
- 12:00 - 1:00 Lunch (Student Center Ballroom)
- 1:00 - 4:00 Break-Out Sessions
- |  |                 |
|--|-----------------|
| Manufacturing Extension Service Providers<br>(Theatre of the Arts) | Phil Nanzetta   |
| Extension Enabling Services<br>(Richards Gallery)                  | Frank Penaranda |
| Technology Access Services<br>(Westbrook Gallery)                  | Tom Starke      |
| Alternative Deployment Pilot Projects<br>(Student Center Theatre)  | John Fenter     |
- 
-

**TRP Deployment  
Proposals Selected  
for  
Negotiation**

**TRP DEPLOYMENT - Proposals Selected for Negotiation**

| No. | Activity Area | Title  | Proposer   | City           | St. | Executing Agency | Announcement Date |
|-----|---------------|--|--|----------------|-----|------------------|-------------------|
| 1   | TAS           | Alaska Technology Transfer Assistance Center (ATTAC)   | University of Alaska SBDC                              | Anchorage      | AK  | NASA             | 11/24/93          |
| 2   | ADPP          | Technology Deployment Through Manufacturing Networks   | Arkansas Rural Enterprise                              | Morrilton      | AR  | NIST             | 2/23/94           |
| 3   | MESP          | Arizona Applied Manufacturing Center   | Maricopa County Community College District (MCCCD)     | Tempe          | AZ  | NIST             | 11/24/93          |
| 4   | TAS           | Composites Technology Deployment   | Cerritos College (CA)/Great Lakes Composite Consortium | Cerritos       | CA  | DOD              | 2/23/94           |
| 5   | MESP          | California MTC to Help 300 Defense Suppliers Diversify to Dual Use   | California MTC   | Hawthorne      | CA  | NIST             | 10/22/93          |
| 6   | ADPP          | Smart Valley Commerce Net  | Enterprise Integration                                 | Palo Alto      | CA  | DOD              | 11/24/93          |
| 7   | ADPP          | Aerogel Commercialization Pilot Project  | Aerojet General Corp.                                  | Rancho Cordova | CA  | DOE              | 11/24/93          |
| 8   | TAS           | Pollution Prevention Center  | Institute for Research and Technical Assistance        | Santa Monica   | CA  | NIST             | 11/24/93          |
| 9   | ADPP          | Xerox Can Plan for Solar Powered Hydrogen  | Clean Air Now  | Venice         | CA  | DOE              | 2/23/94           |
| 10  | TAS           | Manufacturing Extension Partnership: National Interactive Telecasts on Competitive Manufacturing Technologies and Techniques | National Technological University                      | Ft. Collins    | CO  | NIST             | 11/24/93          |
| 11  | TAS           | Rocky Mountain Bio/Medical Conversion & Commercialization Project  | Colorado Bio/Medical Venture Center                    | Lakewood       | CO  | NSF              | 11/24/93          |
| 12  | TAS           | Technology Access Program  | Southern Colorado Business and Technology Center       | Pueblo         | CO  | NIST             | 11/24/93          |
| 13  | TAS           | Center for Global Competitiveness  | Fairfield University                                   | Fairfield      | CT  | DOE              | 2/23/94           |
| 14  | ADPP          | Connecticut Energy and Environmental Technologies Deployment Center  | Connecticut Department of Economic Development         | Rocky Hill     | CT  | DOE              | 12/3/93           |
| 15  | MESP          | Connecticut State Technology Extension Program   | Connecticut Department of Economic Development         | Rocky Hill     | CT  | NIST             | 11/24/93          |
| 16  | TAS           | CONNECT: The N.E. Alliance for Photonics Technology Deployment   | University of Connecticut                              | Storrs         | CT  | NASA             | 11/24/93          |
| 17  | ADPP          | National Infrastructure for Gear Metrology   | ASME   | Washington     | DC  | DOD              | 11/24/93          |
| 18  | MESP          | The Delaware Manufacturing Alliance  | Delaware Development Office                            | Dover          | DE  | NIST             | 11/24/93          |
| 19  | TAS           | Gulf Coast Alliance Technology Access  | University of Florida                                  | Gainesville    | FL  | NASA             | 11/24/93          |

**TRP DEPLOYMENT - Proposals Selected for Negotiation**

| No. | Activity Area | Title   | Proposer   | City           | St. | Executing Agency | Announcement Date |
|-----|---------------|---|--|----------------|-----|------------------|-------------------|
| 20  | TAS           | Moving in a New Direction: Training and Simulation Technology   | Naval Training Systems Center                              | Orlando        | FL  | NASA             | 11/24/93          |
| 21  | TAS           | USP/CMR Technology Deployment Proposal to Provide Micro-electronics Technology Consultants to Support Regional Electronics Manufacturing Industry | University of South Florida                                | Tampa          | FL  | NASA             | 11/24/93          |
| 22  | MESP          | Georgia Manufacturing Technology Extension Center   | Georgia Tech Research Corporation                          | Atlanta        | GA  | NIST             | 10/22/93          |
| 23  | MESP          | Iowa Manufacturing Technology Center (Iowa MTC)   | Iowa State University                                      | Ames           | IA  | NIST             | 11/24/93          |
| 24  | EES           | National Assistance Extension Program for Metal Casting: A Foundation Industry  | University of Northern Iowa (ITD) Metal Casting Center     | Cedar Falls    | IA  | DOE              | 10/22/93          |
| 25  | MESP          | Chicago Manufacturing Technology Extension Center   | Economic Development Commission of the City of Chicago     | Chicago        | IL  | NIST             | 11/24/93          |
| 26  | EES           | Illinois Technology Extension Enabling Partnership Project  | Illinois Department of Commerce & Community Affairs        | Springfield    | IL  | NIST             | 11/24/93          |
| 27  | MESP          | MMTC Colorado Regional Office   | Mid-America MTC  | Overland Park  | KS  | NIST             | 11/24/93          |
| 28  | ADPP          | Kansas Manufacturers Association  | Kansas Manufacturers Association                           | Wichita        | KS  | DOD              | 11/24/93          |
| 29  | MESP          | Kentucky Technology Service   | Kentucky Economic Development Cabinet                      | Frankfort      | KY  | NIST             | 11/24/93          |
| 30  | ADPP          | Massachusetts Manufacturing Modernization Partnership   | Massachusetts Executive Office of Economic Affairs         | Boston         | MA  | NIST             | 10/22/93          |
| 31  | ADPP          | The New England Supplier Institute  | BSSC   | Boston         | MA  | DOD              | 2/23/94           |
| 32  | MESP          | Maryland Manufacturing Modernization Network  | Maryland Department of Economic and Employment Development | Baltimore      | MD  | NIST             | 11/24/93          |
| 33  | TAS           | University Driven Technology Deployment   | University of Maryland                                     | Baltimore      | MD  | NASA             | 11/24/93          |
| 34  | ADPP          | Maryland Healthcare Product Alliance  | Maryland DEED  | Baltimore      | MD  | NASA             | 2/23/94           |
| 35  | TAS           | Electronic Information Services for the Tooling and Machining Industry  | National Tooling and Machining Association                 | Ft. Washington | MD  | DOE              | 11/24/93          |
| 36  | TAS           | Environmentally-Conscious Manufacturing   | Maine Metal Products Association                           | Portland       | ME  | DOE              | 11/24/93          |
| 37  | EES           | Developing Common Methods and Training Agents for Industrial Extension  | Industrial Technology Institute                            | Ann Arbor      | MI  | NIST             | 11/24/93          |
| 38  | TAS           | An Energy & Environmental Technology Access Strategy for Small-Medium Manufacturers   | Midwest MTC / EPA / Great Lakes MTC                        | Ann Arbor      | MI  | NIST             | 10/22/93          |

**TRP DEPLOYMENT - Proposals Selected for Negotiation**

| No. | Activity Area | Title  | Proposer   | City               | St. | Executing Agency | Announcement Date |
|-----|---------------|--|--|--------------------|-----|------------------|-------------------|
| 39  | EES           | Cooperative Network for Dual-Use Information Technologies (CoNDUIT)  | Society of Manufacturing Engineers (SME)             | Dearborn           | MI  | NASA/DOE         | 2/23/94           |
| 40  | EES           | Building a Communication Network Linking Knowledge Providers, Small Business Users and Industrial Extension Agents in Michigan | Michigan State University                            | East Lansing       | MI  | NASA             | 11/24/93          |
| 41  | MESP          | Planning Grant for Michigan Industrial Extension Partnership   | Michigan Department of Commerce                      | Lansing            | MI  | NIST             | 2/23/94           |
| 42  | ADPP          | Minnesota Consortium for Defense Conversion  | Minnesota Technology, Inc.                           | Minneapolis        | MN  | DOD              | 11/24/93          |
| 43  | ADPP          | Improving Manufacturing Processes in Small and Medium-Sized Minnesota Companies  | St. Cloud State University                           | ST Cloud           | MN  | DOD              | 11/24/93          |
| 44  | TAS           | Manufacturers EnterCorp - A Product Realization Access Network   | Dematech / Mid-America MTC                           | Kansas City        | MO  | NIST             | 10/22/93          |
| 45  | MESP          | MAMTC Southern Missouri Regional Office  | MO Enterprise Business Assist Cntr                   | Rolla              | MO  | NIST             | 2/23/94           |
| 46  | EES           | USNet: An Enabling Service for Manufacturing Networks  | Regional Technology Services, Inc. / Georgia Tech    | Chapel Hill        | NC  | NIST             | 11/24/93          |
| 47  | MESP          | North Carolina Alliance for Competitive Technologies (NC ACTS)   | State of North Carolina                              | Raleigh            | NC  | NIST             | 11/24/93          |
| 48  | MESP          | Nebraska Industrial Competitiveness Service (NICS)   | Nebraska Department of Economic Development          | Lincoln            | NE  | NIST             | 2/23/94           |
| 49  | MESP          | New Mexico Manufacturing Extension Program   | New Mexico Industry Network Corporation              | Albuquerque        | NM  | NIST             | 11/24/93          |
| 50  | TAS           | New Mexico Technology Deployment Pilot Project   | University of New Mexico                             | Albuquerque        | NM  | DOE              | 12/3/93           |
| 51  | EES           | Development and Application of an Initial Assessment Procedure for Small Manufacturers (Quickview)                             | New York State Science & Technology Foundation / RPI | Albany             | NY  | NIST             | 11/24/93          |
| 52  | MESP          | Manufacturing Outreach Center of N.Y. - Southern Tier  | New York State Science & Technology Foundation       | Albany             | NY  | NIST             | 11/24/93          |
| 53  | MESP          | New York State Industrial Technology Extension Service Project   | New York State Science & Technology Foundation       | Albany             | NY  | NIST             | 10/22/93          |
| 54  | MESP          | New York City Manufacturing Outreach Center  | New York State Science & Technology Foundation       | Albany             | NY  | NIST             | 11/24/93          |
| 55  | MESP          | Hudson Valley Manufacturing Outreach Center  | New York State Science & Technology Foundation       | Albany (New Paltz) | NY  | NIST             | 11/24/93          |
| 56  | MESP          | Western New York Manufacturing Outreach Center   | New York State Science & Technology Foundation       | Albany (Buffalo)   | NY  | NIST             | 11/24/93          |
| 57  | EES           | National Standards System Network (NSSN)   | ANSI   | New York           | NY  | NIST             | 11/24/93          |

**TRP DEPLOYMENT - Proposals Selected for Negotiation**

| No. | Activity Area | Title   | Proposer  | City          | St. | Executing Agency | Announcement Date |
|-----|---------------|---|---|---------------|-----|------------------|-------------------|
| 58  | TAS           | Long Island Technology Access                                   | Long Island Research Institute                                      | Setauket      | NY  | DOE              | 11/24/93          |
| 59  | EES           | Standard MTC/MOC Manufacturer Information Database              | Great Lakes MTC / Oak Ridge   | Cleveland     | OH  | NIST             | 11/24/93          |
| 60  | MESP          | Plastics Technology Deployment Center (PTDC)                    | CAMP/Great Lakes MTC  | Cleveland     | OH  | NIST             | 11/24/93          |
| 61  | MESP          | Expanding Teaching Factory Services in Northeastern Ohio        | CAMP/Great Lakes MTC  | Cleveland     | OH  | NIST             | 11/24/93          |
| 62  | ADPP          | Alliance for National Excellence Materials Joining              | Edison Welding Institute  | Columbus      | OH  | DOD              | 11/24/93          |
| 63  | TAS           | Technology Access for Product Innovation (TAP-IN)               | Battelle / NASA RTTCs / FLC   | Columbus      | OH  | NASA             | 10/22/93          |
| 64  | TAS           | Hotline Expansion   | Heat Treating Network   | Kettering     | OH  | DOD              | 11/24/93          |
| 65  | MESP          | Defense Enterprise Empowerment Project (DEEP)                   | Edison Materials Technology Center (EMTEC)                          | Kettering     | OH  | NIST             | 2/23/94           |
| 66  | MESP          | The Oklahoma Industrial Extension System                        | Oklahoma Center for the Advancement of Science & Technology (OCAST) | Oklahoma City | OK  | NIST             | 11/24/93          |
| 67  | EES           | Oregon Technology Exchange Consortium (OTEC)                    | Oregon Economic Development Department                              | Salem         | OR  | NIST             | 2/23/94           |
| 68  | ADPP          | The Agile Web Pilot Program                                     | NET Ben Franklin Technology Center                                  | Bethlehem     | PA  | DOD              | 10/22/93          |
| 69  | MESP          | Pennsylvania Manufacturing Extension Program: North/East Region | Manufacturers Resource Center                                       | Bethlehem     | PA  | NIST             | 11/24/93          |
| 70  | TAS           | Technology Access Service                                       | Ben Franklin Technology Center of Southeastern Pennsylvania         | Philadelphia  | PA  | DOD              | 12/3/93           |
| 71  | MESP          | Western Pennsylvania Manufacturing Extension Program            | Southwestern Pennsylvania Industrial Research Center                | Pittsburgh    | PA  | NIST             | 11/24/93          |
| 72  | TAS           | National Technology and Commerce Initiative                     | Knowledge Express / NTTC  | Wayne         | PA  | DOE              | 11/24/93          |
| 73  | MESP          | Southeastern Environmental Resources Alliance                   | States of South Carolina & Georgia                                  | Columbia      | SC  | DOE              | 2/23/94           |
| 74  | EES           | Electronic Extension Service                                    | South Dakota School of Mines & Technology                           | Rapid City    | SD  | NASA             | 11/24/93          |
| 75  | MESP          | Tennessee Manufacturing Extension Proposal                      | State of Tennessee Economic & Community Development                 | Nashville     | TN  | NIST             | 2/23/94           |
| 76  | EES           | Texas-One   | Texas Department of Commerce  | Austin        | TX  | NIST             | 11/24/93          |

**TRF DEPLOYMENT - Proposals Selected for Negotiation**

| No. | Activity Area | Title  | Proposer  | City                | St.     | Executing Agency | Announcement Date |
|-----|---------------|--|---|---------------------|---------|------------------|-------------------|
| 77  | TAS           | The Dual Use Market Place  | Texas Innovation Network                          | Dallas              | TX      | NIST             | 11/24/93          |
| 78  | EES           | Enabling Extension Through NCATC Tools, Linkages, and Professional Development                                       | National Coalition of Advanced Technology Centers | Waco                | TX      | NIST             | 11/24/93          |
| 79  | MESP          | Manufacturing Competitiveness Through Manufacturing Outreach: A Regional Strategy                                    | A.L. Philpott Manufacturing Technology Center     | Martinsville        | VA      | NIST             | 11/24/93          |
| 80  | MESP          | The Creation of the VMC - Virginia's Manufacturing Extension Service   | Virginia Dept. of Economic Development            | Richmond            | VA      | NIST             | 2/23/94           |
| 81  | EES           | Manufacturing Outreach System for Achieving International Competitiveness (Mosaic)                                   | Production Technology Inc. / Tufts University     | Arlington / Medford | VA / MA | NIST             | 10/22/93          |
| 82  | MESP          | Washington Manufacturing Extension Center  | Washington Manufacturing Extension Center         | Everett             | WA      | NIST             | 11/24/93          |
| 83  | ADFP          | Recycling Technology Assistance Project  | Clean Washington Center                           | Seattle             | WA      | NIST             | 10/22/93          |
| 84  | TAS           | Low-Cost High Volume Manufacturing of High-Performance Composite Material Structures for Infrastructure Applications | Great Lakes Composite Consortium                  | Kenosha             | WI      | DOD              | 11/24/93          |
| 85  | MESP          | Northwest Wisconsin Manufacturing Outreach Center  | University of Wisconsin-Stout                     | Menomonie           | WI      | NIST             | 2/23/94           |
| 86  | EES           | Creating a National Industrial Extension Agent Curriculum: An Initiative to Foster Dynamic & Interactive Linkages    | National Technology Transfer Center / PSU / RPI   | Wheeling            | WV      | NIST             | 10/22/93          |

# **Manufacturing Extension Partnership**

## **Management Regions**

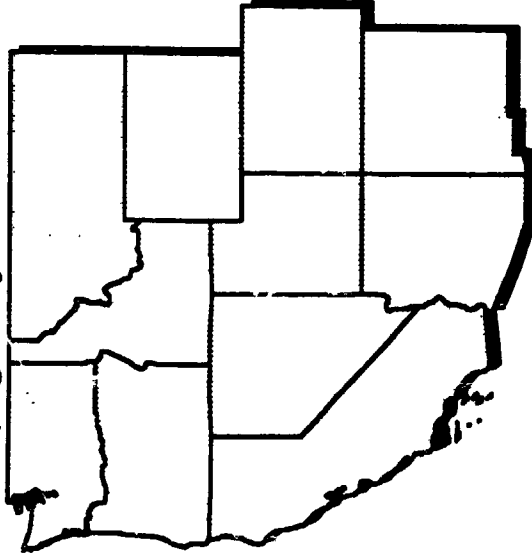




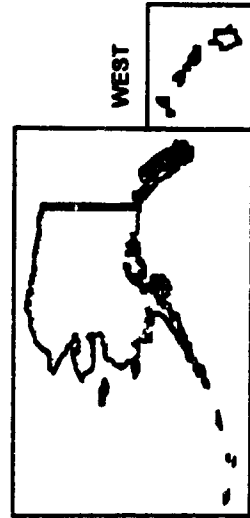
# MANUFACTURING EXTENSION PARTNERSHIP

## MANAGEMENT REGIONS

**WEST**  
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dgold@enh.nist.gov

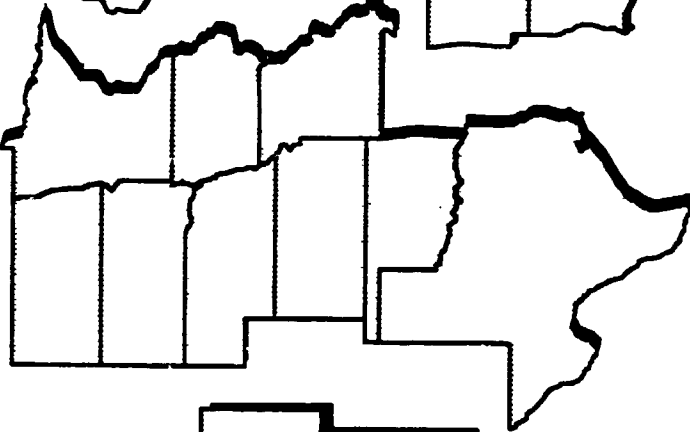


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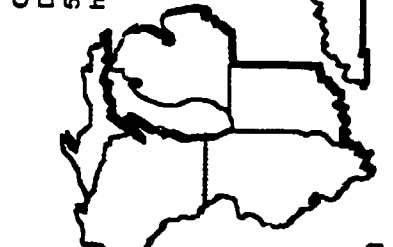


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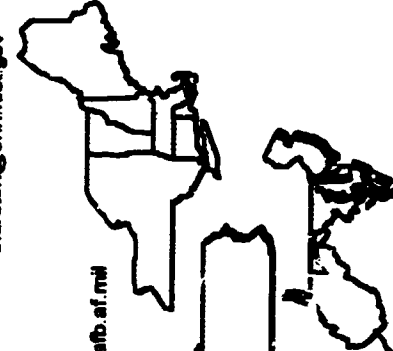
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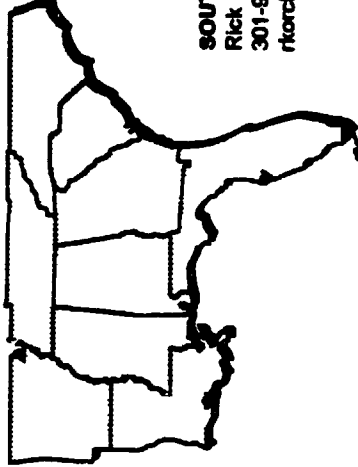


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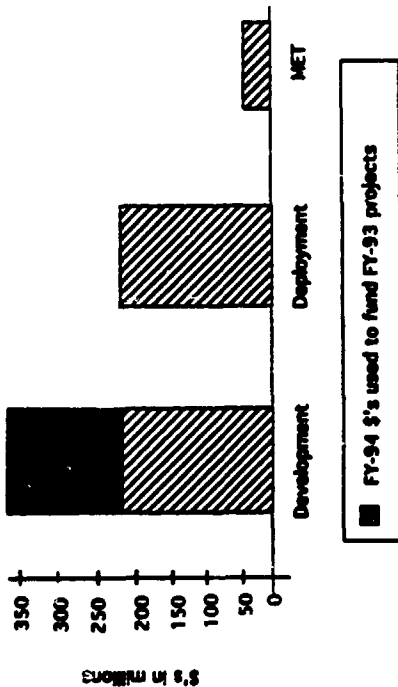


**SOUTH**  
Rick Korchak  
301-975-3580  
rkorchak@enh.nist.gov

**Data on Selection and Selected Proposals**  
**and**  
**Outcomes of the Selection Process**

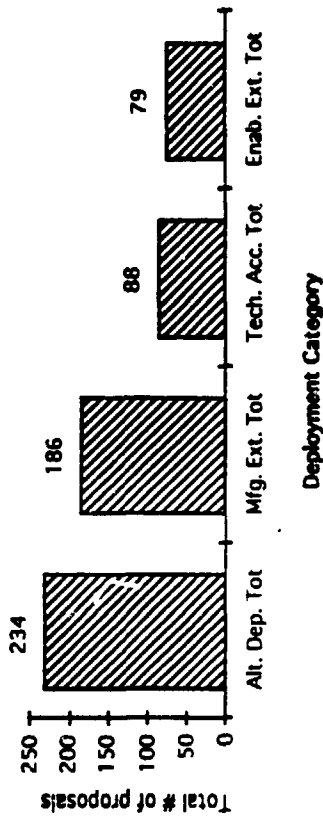
TECHNOLOGY REINVESTMENT PROJECT

Total Amount of TRP Funds Available, by Activity



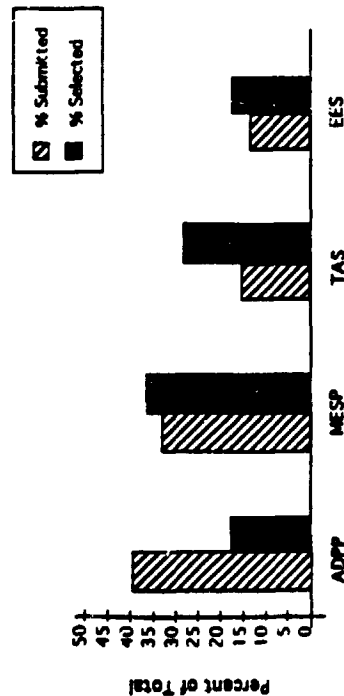
TECHNOLOGY REINVESTMENT PROJECT

Distribution of Deployment Proposals



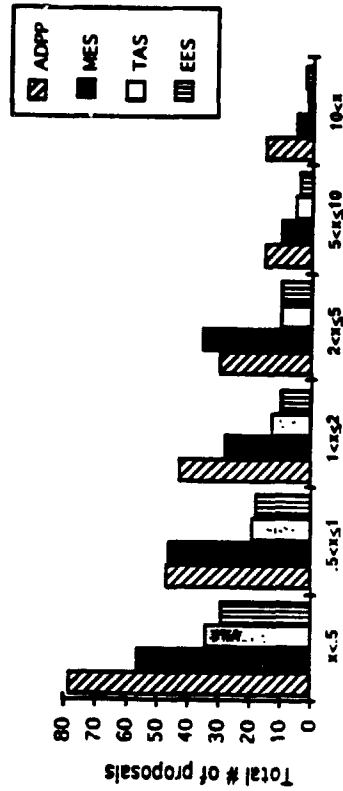
TECHNOLOGY REINVESTMENT PROJECT

Percent of Deployment Proposals Submitted and Selected, by Activity



TECHNOLOGY REINVESTMENT PROJECT

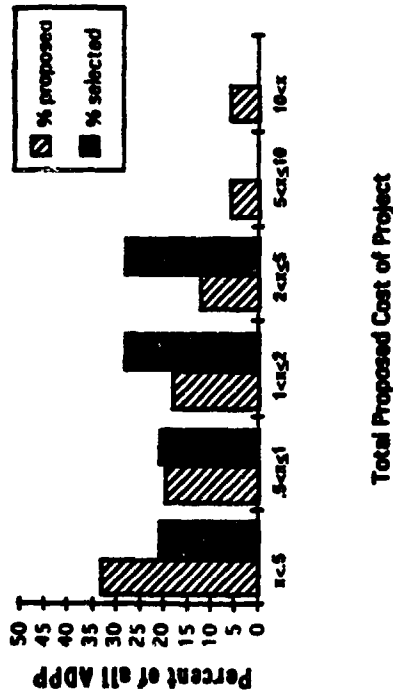
Deployment Proposals, \$ Distribution



x = Total cost of proposed project

TECHNOLOGY REINVESTMENT PROJECT

Alternate Deployment Pilot Projects,  
% Proposed vs. Selected, by \$ Value



Total Proposed Cost of Project

TECHNOLOGY REINVESTMENT PROJECT

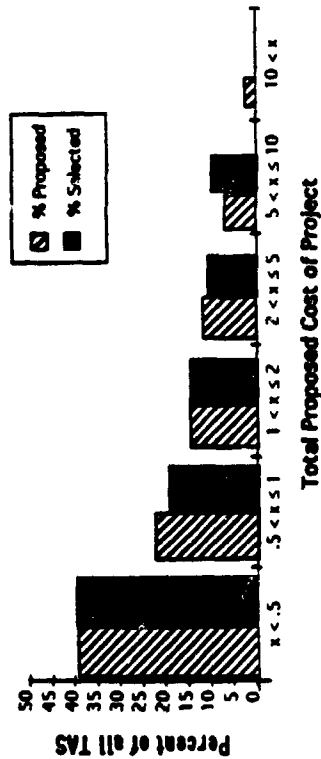
Mfg Ext Services  
% Proposed vs. Selected, by \$ Value



Total Proposed Cost of Project

TECHNOLOGY REINVESTMENT PROJECT

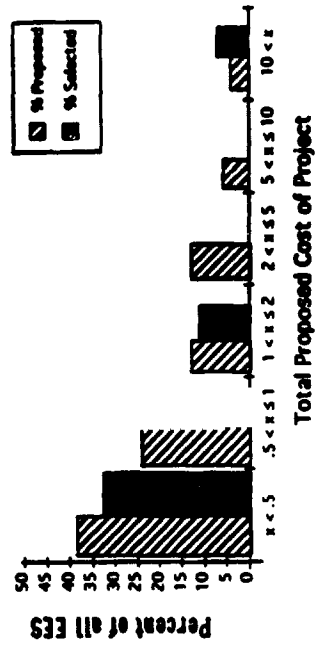
Tech Access Proposals  
% Proposed vs. Selected, by \$ Value



Total Proposed Cost of Project

TECHNOLOGY REINVESTMENT PROJECT

Extension Enabling Proposals  
% Proposed vs. Selected, by \$ Value



Total Proposed Cost of Project

## **Selection Process and Criteria**

## TRP Deployment Selection Process and Criteria

Phil Nanzetta, NIST

Phil Nanzetta nanzetta@nist.nih.gov

11 Jan 2004 page 1

## Logistical Facts

- 549 deployment proposals
- 65 technical reviewers from DOD, DOC (NIST), DOE, NASA, and NSF
- Each review group had one member from each agency
- Every review decision required a minimum of three qualified reviewers
- Proposals were reviewed in three stages
  - first review by a subpanel
  - second review by a source selection evaluation board (SSEB)
  - site visit or interview or equivalent
- Chairmen of the SSEBs were from different agencies
- All review judgements were based strictly on the 8 selection criteria published in the Red Book

Phil Nanzetta nanzetta@nist.nih.gov

11 Jan 2004 page 2

## Target Population

- Proposer must clearly define
- Proposer must understand needs of target population in depth
- Proposer must be within working distance of
- Size must be appropriate to size of budget

Phil Nanzetta nanzetta@nist.nih.gov

11 Jan 2004 page 3

## Defense Conversion, Dual-Use Impacts

- Specifically address needs of defense suppliers and subtier
- Increase competitiveness, number of jobs, quality of jobs
- Help convert companies and workers from defense-dependent to dual use
- Does not exclude other companies from service

Phil Nanzetta nanzetta@nist.nih.gov

11 Jan 2004 page 4

### **Technology Sources**

- Have in-house capabilities and personnel or
- Have access through partners or
- Have access through systematic linkages

Full Name: name@rediffmail.com

LL on 2004 page 5

### **Delivery Mechanisms**

- Matches the needs of the target population
- Are effective
- Handles intellectual property issues
- Uses best industrial practices
- Proposed approach has good technical quality

Full Name: name@rediffmail.com

LL on 2004 page 6

### **Management Experience and Plans**

- Governing or managing entity has clear responsibility and power
- There is significant involvement and support by industry
- Sound organizational structure
- Leadership has experience and quality
- Has sound staffing, evaluation, and training plans

Full Name: name@rediffmail.com

LL on 2004 page 7

### **Funding, Budget, and Cost Share**

- Spending plan must match delivery mechanisms
- Cost share must be solid and certain

Full Name: name@rediffmail.com

LL on 2004 page 8

### **Accessibility of Services and Documentation**

- Fair access to services; not restricted to members
- Documentation of results, especially for pilot projects

PHI Health Services@phil.gov

LL on 304 page 9

### **Coordination and Elimination of Duplication**

- Understand and link with related service providers in service region
- If there is a comprehensive state plan, must be consistent with it
- Does not duplicate existing resources
- Does not clash with existing services

PHI Health Services@phil.gov

LL on 304 page 10



**Key Issues of Content**

## Key Issues of Content

U.S. GAO 2004 page 11

Pub. Release: www.gao.gov

## Focus on the Customer

- Winning proposals start with the target population (customer) and focus on it throughout
- Losing proposals focus on what the proposer wants to do
- Winning proposals are specific, concrete, and demonstrate a believable understanding of the target population and its needs
- Losing proposals are generic, abstract, and focus on technology push instead of customer need

U.S. GAO 2004 page 12

Pub. Release: www.gao.gov

## Strong Management and Organization

- Winning proposals lay out a clear organization (it may be complex) with a clear point of control and responsibility. A good organization chart helps.
- Losing proposals have a mushy organization, confusing, and with divided control and responsibility. A bad chart hurts.
- Winning proposals identify their limitations and show how they will address them
- Losing proposals pretend not to have any limitations, but they peek from behind every paragraph
- Winning proposals make sense. From the point of view of the customer, participant, and sponsors
- Losing proposals have no way to attract customers, participants that don't contribute, and letters of support that don't make any commitments.

U.S. GAO 2004 page 13

Pub. Release: www.gao.gov

## Match

- Winning proposals have a solid commitment of match, all of which clearly contributes to the objective. Cash, of course, is very good.
- Losing proposals have unbelievable or weak match, or match that really doesn't support the objective. Useless equipment, unrelated in-kind, or small percentages of personnel time are weak.
- Winning proposals have reasonable, soundly based fee schedules (if fees are charged).
- Losing proposals project fee-based income with poor justification at levels contrary to common experience.
- Winning proposals have state match already appropriated in advance, "opportunity" funds that can be tapped, or very firm state commitment of funds
- Losing proposals have "best wishes" letters from the governor or weasel-worded support.

U.S. GAO 2004 page 14

Pub. Release: www.gao.gov

### Technical Capacity

- Winning proposals have sound technical capability which is really available for the project
- Losing proposals are not technically equipped to implement the project

FD-302 (Rev. 10-6-95)

U.S. GPO: 2004-500-107

### Credibility and Believability

- Winning proposals make reasonable, credible claims which are internally consistent and agree with known facts
- Losing proposals clearly overstate their position and include assertions that do not agree with known facts
- Winning proposals explain why they are the right organization to do the job, that they have considered the alternatives of "somebody else" or "a new entity". Winning proposals show the proposed activities are within (or close to) their mission and range of expertise
- Losing proposals look like they are just trying for some available resources.

FD-302 (Rev. 10-6-95)

U.S. GPO: 2004-500-107

### Judgeable

- Winning proposals correspond to natural operating entities which can be evaluated as a unit
- Losing proposals bunch together a number of separate entities, some weak and some strong, to make a bundle that is not clearly judgeable.

FD-302 (Rev. 10-6-95)

U.S. GPO: 2004-500-107

## **Key Issues of the Process**

## Key Issues of the Process

- Proposals
- Site Visits

Tom Starke

Department of Energy (LANL)

Deployment  
Lessons Learned Workshop  
Atlanta, Georgia  
March 9, 1994

## Purpose of the Proposal

- Describe the proposed activity:
  - What
  - Who
  - So What
  - How
  - How Much
- How much will the activity further TRP goals
  - In terms of the selection criteria
- Statement of Work

## The evaluator is an Information Customer

- Clarity
- Organize for evaluation
  - all proposal information is evaluated against the criteria
- Fact-based arguments
  - Not assertions
  - Relevant facts
  - Arm your advocate
- What exists now, versus what's proposed
- Know your concept's backdrop

## Purpose of the Site Visit

- Validate Proposal
- Assess Quality of Teaming
- Proposer's Relation with Target Population
- Inspect Facilities to be Used

## The evaluator is an Information Customer

- **Site choice:**
  - Demonstrations
  - hours
  - availability of key team members
- **Understand the instructions, otherwise ask.**
- **Rehearse**
  - Know your team members
  - Know your target population representatives
- **Have a simple explanation of your concept**

## The evaluator is an Information Customer

- **Listen as much as you talk**
  - Leave time for questions
  - Expect the agenda to be disrupted
  - Anticipate emphasis on the weakest or most critical areas
  - Its often ok to acknowledge you don't have a few of the answers
- **Expect everything the evaluators see to be included in the site visit evaluation**
- **Challenge the evaluators if you believe their facts are wrong**

# Partnerships

## PARTNERSHIPS

### VALUE TO THE PROPOSAL

- O SIZE**
  - How Many Partners ?
  - Adequacy for The Job
  - Critical Funding Levels
  
- O DIVERSITY**
  - Complementary Mixture of Partners
  - Skills; Target Group Representation; Geographics
  
- O COHESIVENESS**
  - Delineation of Responsibilities
  - Clear Organization; Firm Agreement; Legal Document
  
- O LEADERSHIP**
  - Clear Management Structure; Who's in Charge?



**Example**

**Georgia Manufacturing Technology  
Extension Center**

## PROPOSAL DEVELOPMENT

- Get started early
- Select experienced proposal team
- Focus on executive summary
- Have outsiders review proposal
- Focus on approach, not the organization
- Include partners in development
- Give proposal quality advantage
- Treat site visit like sales presentation

## STRATEGY DEVELOPMENT

- Don't give up after the first try
- Be customer-needs driven
- Gain sponsor endorsement during pre-proposal period
- Seek partnerships
- Deal with cost-sharing early

**Breakout Sessions**

**Manufacturing Extension Services Providers**

**Extension Enabling Services**

**Technology Access Services**

**Alternative Deployment Pilot Projects**

**Manufacturing Extension Services Providers**

**Characteristics of Strong Extension  
Proposals**

**and**

**The TRP Process  
New York's Experience**

## Characteristics of Strong Extension Proposals

Phil Nanzetta, NIST

www.nist.gov

11 Jan 2011

## Focus on the Customer

- Strong
  - Focus and clear commitment to helping a target population, with a good understanding of the target population
- Weak
  - Have an existing organization to feed, and only a shallow understanding of a target population
- Red Flag
  - Have an existing organization to feed, and no apparent care for a target population
  - Building an empire, and no apparent care for a target population

www.nist.gov

11 Jan 2011

## Learning Organization

- Strong
  - Organization and management allows for significant changes it learns from experience or from others
- Weak
  - Management personnel are inflexible and doctrinaire, or very weak
  - Organizational structure is set in concrete
  - Couldn't get the attention of the level above if you wanted to
- Red Flag
  - Management is confrontational and intransigent
  - Level above doesn't care about results

www.nist.gov

11 Jan 2011

## Relationship to Industry

- Strong
  - Tight ties to industry, understanding of industry needs, as reflected in organization, staffing, and board
- Weak
  - Lip service to industry participation or need
  - Academic or government dominated board
- Red Flag
  - No industry influence visible

www.nist.gov

11 Jan 2011

## Quality of Match

- Strong
  - Full match in cash, already appropriated
  - In-kind part of match is economically practical and would be purchased if match were all in cash
- Weak
  - High proportion of in-kind match consisting of low percentage shares of staff time, loosely related equipment and facilities, and "white elephants" that are no longer of use to the initial owner
- Red Flag
  - Extremely unrealistic projections of fees for service or membership fees
  - Loose indications of appropriations to come in the future

www.ghd.com

11 Jan 2015

## Character of the Proposal

- Strong
  - Clear, compactly, honestly written proposal
- Weak
  - Sloppy, negligently written proposal which does not address the concerns in the selection criteria
- Red Flag
  - False statements or exaggeration beyond the bounds of good taste
  - Proposal which clearly skirts issues that are important for the selection criteria

www.ghd.com

11 Jan 2015

## Good Delivery Mechanism

- Strong
  - Clear, strong delivery mechanism, described so it makes sense and relies only on partners who have an interest in success of the project
- Weak
  - Poorly conceived, poorly described, unfocused delivery mechanism
- Red Flag
  - Attention to income and empire building, with little or no focus on the delivery mechanism

www.ghd.com

11 Jan 2017

## Access to Technology

- Strong
  - Clearly described, effective means of access to technology
- Weak
  - Technology present in the environment of the proposer, but no effective mechanisms of access are described
- Red Flag
  - Proposer has a narrow "favorite" technology it's pushing
  - No indication of a means for access to technology

www.ghd.com

11 Jan 2015

## Don't clash, don't duplicate

- Strong
  - Identifies service providers and technology sources in the region and describes effective coordination with them, proven by actual examples from the past
- Weak
  - Defines coordination with some of the service providers and technology sources, but they are new and untested
  - Is not aware of many service providers and technology sources
- Red Flag
  - Proposes to set up shop next door to a service provider with no defined means for coordination
  - Proposes to develop technology which is already available from an existing source

**The TRP Process**  
**New York's Experience**



## THE TRP PROCESS : NEW YORK'S EXPERIENCE

## CONTEXT FOR NYS MANUFACTURING RELATED TRP PROPOSALS : DEFINING THE ISSUES

- Manufacturing is important to NYS
- 28,000 firms, nearly all small
- Employ 1 million
- Smaller firms source of new jobs

## TRP DEPLOYMENT LESSONS LEARNED WORKSHOP

Presented by Mark S. Vanden  
Director of Research  
Program of National Technology Research  
Institute  
Rensselaer Polytechnic Institute  
Troy, N.Y. 12180  
Telephone : 518-273-2900

## CONTEXT FOR NYS TRP PROPOSALS : DEFINING THE PROBLEM

- About 2,000 fewer factory establishments than four years ago
- Since 1988, NY has lost nearly 200,000 manufacturing jobs
- 18% decline vs. 7% loss nationally
- Job loss due mainly to overseas competition
- Inability of firms to modernize major factor

## NYS MANUFACTURING FIRMS BY REGION

| REGION        | NUMBER OF FIRMS |
|---------------|-----------------|
| Capital       | 1,000           |
| Central NY    | 1,000           |
| Finger Lakes  | 1,500           |
| Long Island   | 5,000           |
| Mid-Hudson    | 2,500           |
| Mohawk Valley | 500             |
| NY City       | 13,500          |
| North Country | 500             |
| Southern Tier | 1,000           |
| Western NY    | 2,000           |
| <b>TOTAL:</b> | <b>28,500</b>   |

**CONTEXT FOR NYS TRP PROPOSALS :  
DEFINING THE TARGET POPULATION :**

**CHARACTERISTICS OF TYPICAL SMALL  
MANUFACTURERS**

- Is family owned or sole proprietorship
- Is a supplier of parts to a larger manufacturer
- Has customers that are other business, not end users
- Has less than 50 employees; and sales of under \$5 million

**CONTEXT FOR NYS TRP PROPOSALS :  
DEFINING THE TARGET POPULATION**

- Should upgrade operational and management capability
- Has limited in-house engineering and technical staff
- Benefits of technology realized but considers them out of reach
- Is in a reactive mode to marketplace changes
- Lacks systematic planning

**CONTEXT FOR NYS TRP PROPOSALS :  
DEFINING THE NEED**

To stay competitive, these manufacturing firms need to:

- Engage in strategic planning
- Speed the adoption of new and rapidly evolving technologies
- Invest in modern plant and equipment
- Improve worker productivity, training and involvement in the redesign of manufacturing process

**CONTEXT FOR NYS TRP PROPOSALS :  
DEFINING THE NEED**

- Develop new domestic and export markets in a rapidly changing global economy
- Improve quality control and management techniques

## **NYS TRP PROPOSAL : ADDRESSING THE NEED**

### **EXISTING NYS PROGRAM INITIATIVES**

- 1982 - Industrial Technology Councils established
  - Local non-profit organizations
  - Industry Led
- 1986, 1990 - Industrial Technology Extension Service established state wide
- 1989 - Northeast Manufacturing Technology Center (NEMTC)

### **NY's TRP ACTION PLAN**

- Work with local ITC's throughout
- Statewide information meetings (Jan. - March '93)
- Attended TRP briefings (April '93)
- Individual regional meetings (May, June '93)
- Proposal review (July '93)

## **NY's TRP STRATEGIC APPROACH : MAJOR THEMES**

- Manufacturing firm is the customer
- Build on existing programs to serve the customer
- Locally responsive proposals; locally managed
- State coordination
- Access to State and local matching funds
- Leverage local resources

## **NY's TRP ACTION PLAN INDUSTRIAL TECHNOLOGY EXTENSION SERVICE (ITES) PROPOSAL**

*Concept: Expand NYS manufacturing extension personnel from 17 to 50*

- NYSSIF TRP Proposer
- Sub-contract with ITC's
- Target regions with high manufacturing clusters
- TRP funds : 50%  
State funds : 50%
- Managed by NYSSIF

**NY's TRP ACTION PLAN :  
MANUFACTURING OUTREACH  
CENTERS (MOC)**

**Concept :** Local centers of special assistance to firms

- Proposals from 6 manufacturing regions
- Local resources tied in
- Integrated with Extension Service and NEMTC
- Part of statewide manufacturing assistance system

**NY's TRP ACTION PLAN :  
MANUFACTURING OUTREACH  
CENTERS (MOC)**

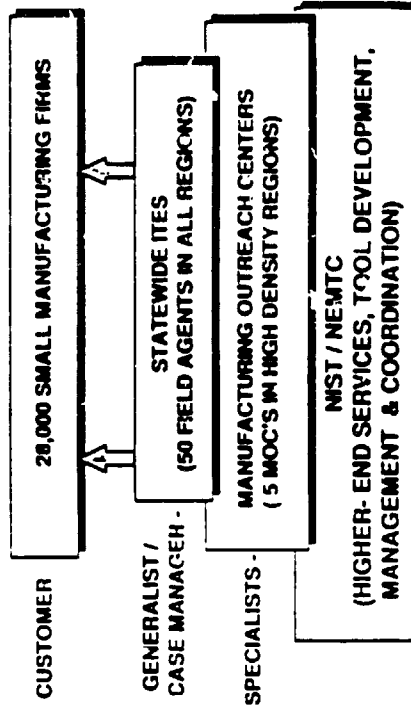
- NYSSTF as TRP proposer
- Local ITC sub-contractor and regional management entity
- TRP funds : 50%  
State funds : 25%  
Local funds : 25%

**NY's TRP ACTION PLAN :  
NORTHEAST MANUFACTURING  
TECHNOLOGY CENTER (NEMTC)**

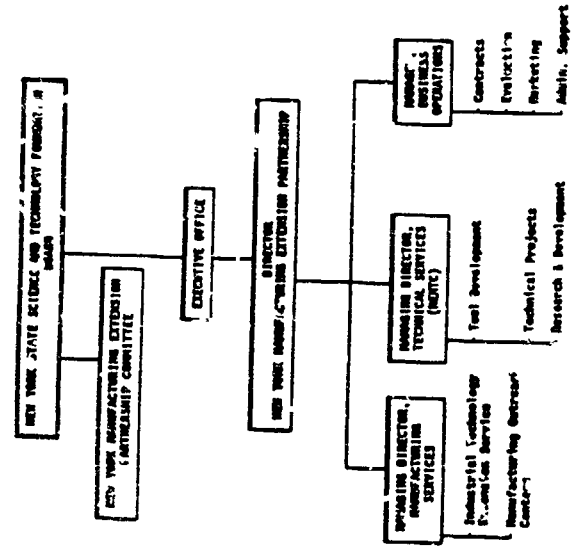
**Concept :** Develop "tools" and support for extension service and MOC's to help firms

- Proposal developed by NEMTC and RPI
- NYSSTF TRP proposer
- RPI as subcontractor
- TRP funds : 50%  
State funds : 50%

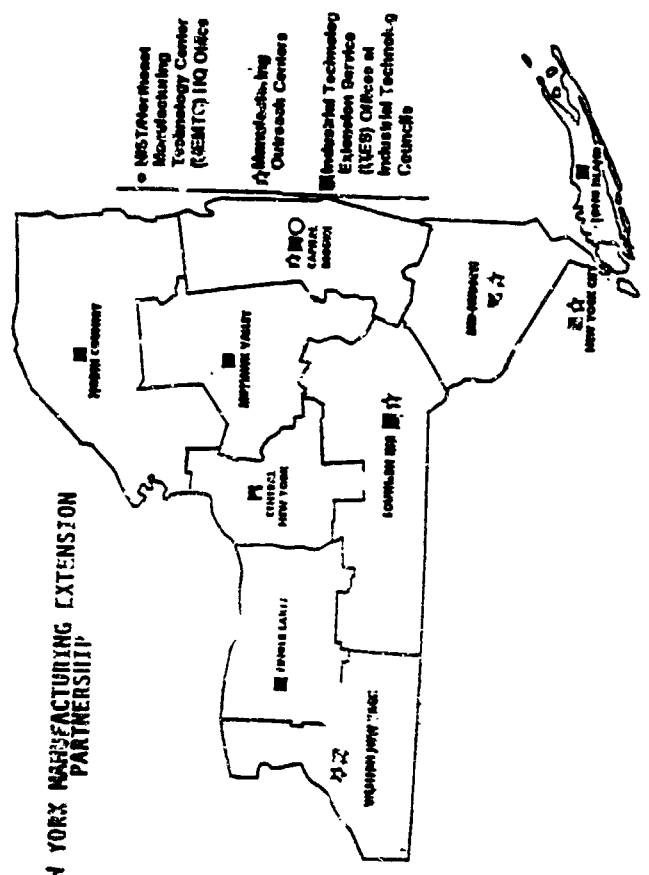
**NEW YORK'S MANUFACTURING  
EXTENSION PARTNERSHIP**



NEW YORK MANUFACTURING EXTENSION PARTNERSHIP ORGANIZATION PLAN



NEW YORK MANUFACTURING EXTENSION PARTNERSHIP



SUMMARY of TRP PROPOSALS SUBMITTED by NYSSTF and APPROVED by TRP

| Proposals Submitted | Proposals Approved | Program Area                  |
|---------------------|--------------------|-------------------------------|
| 1                   | 1                  | Industrial Extension Service  |
| 6                   | 4                  | MOC's                         |
| 3                   | 1                  | NEMTC Projects                |
| 4                   | 0                  | High Tech Assistance Projects |
| 14                  | 6                  |                               |

TRP PROPOSAL PREPARATION TIPS

- Put the "customer" first (target population)
- Make sure you have right context and rationale
- Communicate with team members early and often
- Make a convincing case in the Executive Summary

### TRP PROPOSAL PREPARATION TIPS

- Secure reliable sources of matching funds.
- Do you believe in the project?

### TRP SITE INTERVIEWS PREPARATIONS and TIPS

- Have only key people attend
  - Project leaders and doors
- Meet before the meeting
- Provide organizational context and structure
- Answer reviewers written questions briefly, but thoroughly

### TRP SITE INTERVIEWS PREPARATIONS and TIPS

- Use appropriate visuals and demonstrations  
( video tapes, overheads, etc.)
- Don't be defensive; OK to say "I don't know"

### FUNDING SUMMARY - TRP PROJECTS to NYSSTF

Projects Awarded : 6

Federal TRP Funds : \$ 4,675,000  
NY State Matching Funds : \$ 2,800,000  
Local Cash and Inkind Funds : \$ 1,925,000

Total Annual Funds : \$ 9,350,000

## **Extension Enabling Services**

Presented by: Frank Penaranda  
at Lessons Learned Workshop

## TRP DEPLOYMENT -- EXTENSION ENABLING SERVICES

### DISTRIBUTION OF AWARDS BY CATEGORIES

#### AREAS SERVED

8 - National

6 - States

1 - Industry Sector

#### FOCUS

5 - Elec. Networks

2 - Data Bases

5 - Training

1 - Tools

2 - States Structures



# EXTENSION ENABLING SERVICES

## EVALUATION CRITERIA

The selection criteria contained on this sheet apply to extension enabling services activities for technology deployment. They also incorporate the statutory selection criteria for the TRP programs. Each proposal must address these selection criteria. Selection criteria are grouped into eight equally weighted categories. *Special selection factors for technology sources, delivery mechanisms, management experience and plans, funding, budget, and cost share, accessibility of services and documentation, and coordination and elimination of duplication [in italics] are given to amplify the general criteria and are not additional criteria.*

### (1) Target Population

The proposal should target a clearly defined population of beneficiary companies or organizations, and should clearly identify the needs which the proposal addresses. The target population should include a significant number of United States-based small manufacturing firms and/or companies dependent upon Defense expenditures, and should be large enough to justify the proposed expenditure. The approach set forth in the proposal should be reasonable for the needs identified and the defined population. Factors that will be considered include:

- (a) Demonstration of a clear definition of the target population, its size, needs, and demographic characteristics.
- (b) Demonstration of an understanding of the needs of the target population.
- (c) Appropriateness of the plan to address the identified needs of the target population.
- (d) Appropriateness of the size of the target population and the anticipated impact for the proposed expenditure.

### (2) Defense Conversion, Dual-Use Impacts

The proposal must provide a substantial impact in advancing defense conversion objectives. It should specifically address the needs of defense suppliers and their subtier suppliers. It should increase competitiveness, number of jobs, and quality of jobs. Factors that will be considered include:

- (a) Degree to which the planned approach will serve a substantial number of defense suppliers and their subtier suppliers.
- (b) Effectiveness of the proposed approach in increasing competitiveness, number of jobs, and quality of jobs through the target population particularly among displaced defense workers.
- (c) Degree to which the proposed approach can serve to convert businesses and their workforces from defense-

dependent to capabilities having both defense and non-defense commercial applications.

### (3) Technology Sources

For proposals that focus on work directly with small businesses, the proposal should demonstrate that the proposer has adequate access to the technology needed to provide sound service. This access is through a combination of in-house expertise and experience, partnerships with technology sources, and linkages to external technology sources. It is the linkage and understanding of how to gain access to technology that is most important.

Proposals to extract technology will be based on existing core competency, not on an intent to develop in-house expertise. The proposal must set forth a convincing plan for identifying the needed technology within an organization and for "extracting and packaging" the technology. Special factors for each activity expand on these criteria.

#### Special Selection Factors:

- (a) Strength of existing core competency in the proposed area of activity.
- (b) Adequacy of plans to identify technology within the proposer's organization and to extract and package it for use by others.

### (4) Delivery Mechanisms

The proposal must set forth a clearly defined, effective mechanism for delivery of services to the target population. For extension service providers, this refers to the means for working directly with target companies. For technology sources, this calls for well thought-out plans for formation of linkages to the organizations that work directly with companies. Special factors for each activity expand on these criteria. Factors that will be considered include:

- (a) Effectiveness of proposed delivery mechanism.
- (b) Demonstration of capacity to form the effective linkages and partnerships necessary for success of the proposed activity.
- (c) Adequacy of plans to handle intellectual property issues.
- (d) Technical quality of the proposed approach, including knowledge and use of best industrial practices.

#### Special Selection Factors:

- (a) Adequacy of plans for identifying in-house or external sources of technology to meet the needs of target population.

(b) *Strength of plans to establish linkages with service providers and demonstrated success in forming and maintaining such linkages.*

## **(5) Management Experience and Plans**

The proposal must set forth plans for proper organization, staffing, and management of the activity and must demonstrate that the leadership of the activity has a strong, current experience base to assure success. Special factors for each activity expand on these criteria. Factors that will be considered include:

- (a) Appropriateness of the organizational approach for carrying out the proposed activity.
- (b) Quality and depth of experience of the proposed leadership and the organization within which they will work.
- (c) Soundness of staffing plans, including recruitment, selection, training, and continuing professional development.
- (d) Thoroughness of evaluation plans, including internal evaluation for management and control, and external evaluation for assessing outcomes of the activity, and "customer satisfaction" measures of performance.
- (e) Presence of a governing or managing entity with clear responsibility for performance of the proposed activity.
- (f) Evidence of significant involvement and support by private industry.

### **Special Selection Factor:**

*Proposals should identify, treat, and resolve issues regarding selection of beneficiaries of the project. There should be a demonstrated valid public purpose in the distribution of benefits. The approach will not create an unfair technological or competitive advantage for one company or group of companies.*

## **(6) Funding, Budget, and Cost Share**

The proposed spending plan must reasonably match the proposer's projected activities. The proposal must contain a reasonable and practical plan for obtaining the cost share; i.e., that part of the budget not covered by the requested federal funds. Special factors for each activity expand on these criteria. Factors that will be considered include:

- (a) Reasonableness of the budget, both income and expenses.
- (b) Strength of commitment for proposer's cost share.
- (c) Effectiveness of management plans for control of the budget.
- (d) Appropriateness of in-kind contribution.
- (e) Adequacy of plans for out-year funding.

### **Special Selection Factor:**

*The likelihood that within five years after award, DoD assistance will not be necessary to sustain the program.*

## **(7) Accessibility of Services and Documentation**

Fair access to the services defined in the proposal must be available to all members of the target population. For pilot projects especially, and all projects in general, there must be plans for broadly disseminating the results of the proposed activity. Special factors for each activity expand on these criteria. Factors that will be considered include:

- (a) Adequacy of plan for handling requests for diverse services.
- (b) Strength of plan for documenting, evaluating, and disseminating information on new approaches taken and on outcomes of activities.

### **Special Selection Factor:**

*The proposer's plan will specify the process for documenting the pilot project, analyzing its results, and publishing the analytical case study to help others replicate, modify, or avoid the approach.*

## **(8) Coordination and Elimination of Duplication**

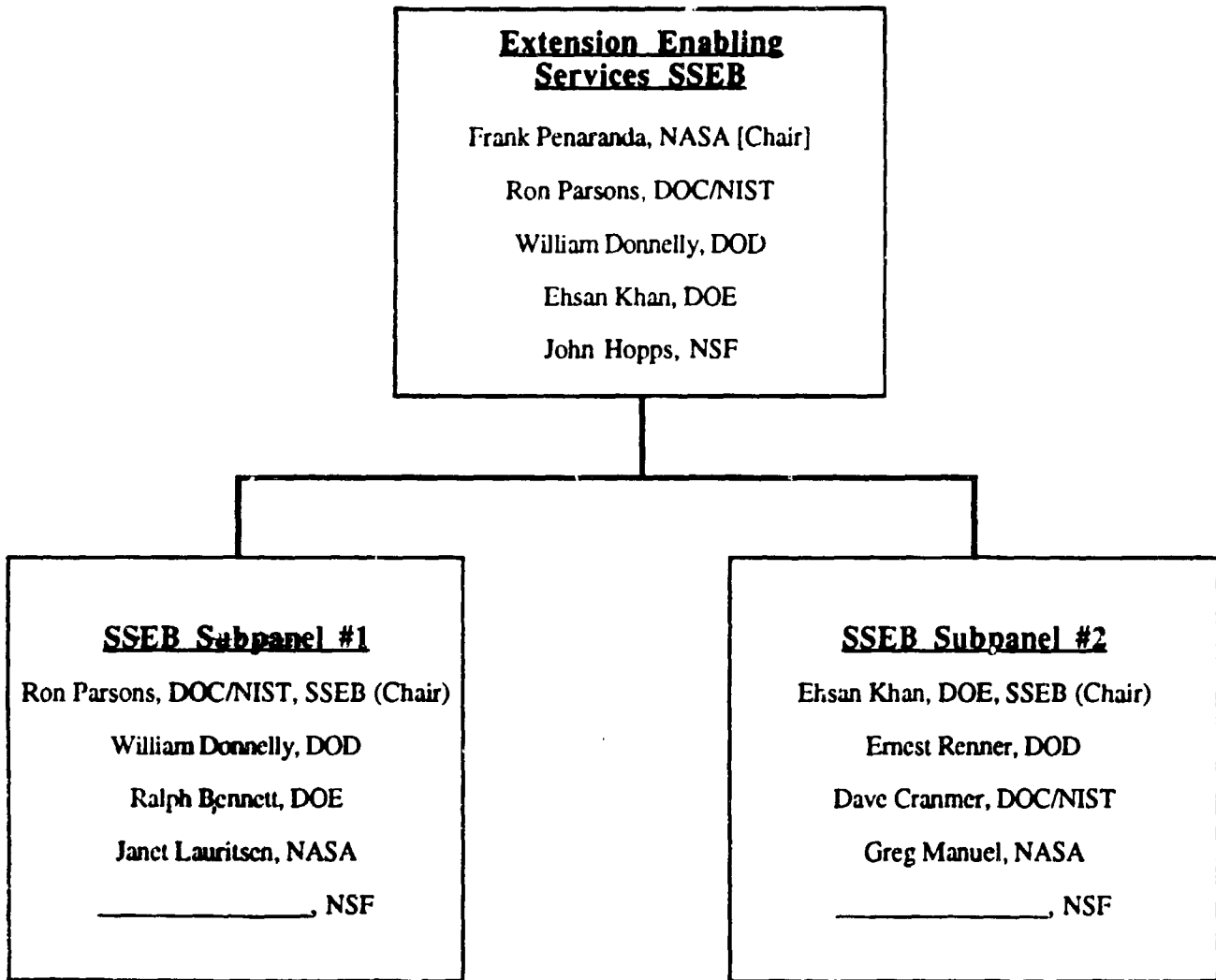
It is desired to minimize the creation of services and technology sources which duplicate, overlap, or conflict with existing resources. The proposer must demonstrate an understanding of existing organizations and resources within its environment and establish working linkages where appropriate. If there is a comprehensive state plan for technology transfer and extension, the proposer should document that its plan is consistent with the state plan. Special factors for each activity expand on these criteria. Factors that will be considered include:

- (a) Understanding of existing organizations and resources related to the proposed target population.
- (b) Adequate linkages and partnerships with existing organizations.
- (c) Consistency with comprehensive state plans if such plans exist.

### **Special Selection Factors:**

- (a) *The proposal must demonstrate the extent to which the proposed approach makes use of existing technology resources and service providers, and the extent to which the proposer demonstrates an awareness of other pilot projects with the same structure.*
- (b) *The impact of the proposed approach, if successful, will be large enough to justify the investment. There should be some demonstration that the approach can be replicated elsewhere with large impact.*

# Extension Enabling Services SSEB Structure



7/29/93

7:05 AM

## Defense Conversion, Dual-Use Impacts

- **Good**
  - Defense impacted firms identified as fraction of target population
  - Special needs of defense impacted firms identified
  - Attention to stimulating employment opportunities for defense displaced workers
  - Appropriateness of technology to dual-use applications
- **Poor**
  - General references to Defense reduction impacts in a geographic area

## Technology Sources

- **Good**
  - Appropriate for the target population
  - Technically excellent
  - Committed to and experienced with existing small companies
  - Ability to access technology sources outside the project
- **Poor**
  - Not explicitly identified
  - Insufficient for the target population

## Delivery Mechanisms

- **Good**
  - Efficient and cost effective
  - Appropriate for tech sources and target population
  - Already demonstrated
  - Innovative
- **Poor**
  - Generic
  - Inflexible and complex
  - Too much technology development

## Management Experience and Plans

- **Good**
  - An established team
  - A clear statement of work
  - A realistic schedule
  - A budget organized against the statement of work
  - Examples of past success managing deployment activities
  - Project plan aimed at self-sufficiency
  - A plan for effective communication with tech sources and target population
- **Poor**
  - No discussion of risks and mitigation options

## Funding, Budget, and Cost Share

- Good
  - A clear budget presentation
  - Budget organized against the statement of work and the schedule
  - Cash or earned personnel time cost share
  - Established accounting cost control processes
- Poor
  - The most funding requested for stated deliverables

## Accessibility of Services and Documentation

- Good
  - Service accessible to every member of target population
  - Project included target population outreach activities
  - Project planned for success, planned for proliferation of the approach
- Poor
  - Not addressed

## Description of Awards

## Coordination and Elimination of Duplication

- Good
  - Thorough understanding of competing and complementary services and extension systems
  - Established relationships with complementary services
  - Coordinated with state or national extension organizations
- Poor
  - Uniqueness asserted

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# **Technology Access Services**

# Tech Access Services Lessons Learned Workshop

Tom Starke  
Department of Energy (LANL)

Atlanta, Georgia  
March 9, 1994

# Lessons Learned Feedback

## Global Characteristics of Good Proposals

- Proposed project was an integrated whole
- Every piece of information in the proposal was competitive:
  - Choice of team members
  - Kind of matching funds
  - relation to existing programs
- Quality was supported by fact-based argument, not just assertions
- Evidence of a well-defined and smoothly functioning team
- Commitment to transition to self-sufficient status

## Target Population

- Good
  - Well defined, clearly identified
  - Demonstrated understanding of the needs
  - Representativeness of target population on the team
  - Appropriate for funding
  - In need of technology assistance
- Poor
  - Too many companies
  - Insufficient needs articulation

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## National: All Technologies

- National wide systems for organizing access to all technologies
- Total funding: \$21.4 million
- Examples:
  - Knowledge Express Database
  - TAP-91, utilizing a partnership of RTTCs
  - National Interactive Telecasts

## National: Single Tech Focus

- National-wide system for organizing access for a single industry or a specific technology
- Total Funding: \$ 6.2 million
- Examples:
  - National Hotline for metal heat treatment
  - Electronic information services for logging and machining industry
  - Composite tech information for infrastructure applications

## Regional: Single focus

- Regional technology access organized around a single tech source, technology, or application
- Total Funding: \$8.3
- Examples:
  - CUWATER
  - Training in...
  - Pollution Free
  - N. Alliance Av. Phoenix Tech. 4/91/97

## Regional: All Technologies

- Regional technology access service covering many technologies and industries
- Funding: \$ 10.7 million
- Examples:
  - Ben Franklin Technology Access Service
  - Alberta Tech Traveler Assistance Center
  - Long Island Technology Access



## **Alternative Deployment Pilot Projects**

TECHNOLOGY REINVESTMENT PROJECT  
TECHNOLOGY DEPLOYMENT

ALTERNATIVE DEPLOYMENT PILOT PROJECTS

ALTERNATIVE DEPLOYMENT PILOT PROJECTS

JOHN R. FENTER  
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Key Participants:

|                 |        |
|-----------------|--------|
| John Fenter     | DOD/AF |
| Phillip Heyes   | DOE    |
| John Hopps      | NSF    |
| Gale Morse      | NIST   |
| James Thornton  | NIST   |
| James Velazquez | NASA   |

ALTERNATIVE DEPLOYMENT PILOT PROJECTS

- Aerogel Commercialization Pilot Project
- Agile WEB Pilot Project
- Alliance for National Excellence in Materials Joining
- Connecticut Energy and Environment Technologies Deployment Center
- Deployment of a National Infrastructure for Laser Metrology
- Improving Manufacturing Processes for SMEs in Minnesota
- Mass Manufacturers Association: A Consortium to Accomplish Defense Conversion
- Maryland Healthcare Product Alliance
- Massachusetts Manufacturing Modernization Partnership (M3P)
- Minnesota Consortium for Defense Conversion
- New England Suppliers Institute
- Recycling Technology Assistance Project
- Saratoga Valley CommercialNet
- Technology Deployment Through Manufacturing Networks
- Xerox CAM Plan for a Solar Powered Hydrogen Generating Facility

ALTERNATIVE DEPLOYMENT PILOT PROJECTS

- Pilot projects providing nontraditional industrial and manufacturing assistance
- ADPP aims to:
  - Improve the technological strength of defense dependent small business
  - Understand and improve the interactions between prime contractors and their supplier chains, including business culture factors
  - Harmonize quality and other requirements prime place or their suppliers within an industrial sector
  - Promote adoption of world class best practices throughout the prime-supplier structure
  - Support small company incubators
- Projects are encouraged to address commercialization of new technologies and to pursue dual-use technology applications

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS Project Models

- Best Practices
  - Team-based Methodology for Problem Solving and Process Improvement
  - Critical Industry Technical Resource Service
- Small Company Incubators
  - State-led Program Focused on Dual-Use Technology Development
- Dual-Use Technology Applications
  - Competitive Network Pursuing New Business
  - Private Sector Commercialization for Fed Lab Technology
  - Conversion of Advanced Defense Technologies
  - Integration of Previously Developed Federal Technology

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS

### Common Aspects:

- The DSEB assessed each project model to determine suitable approaches for providing new concepts for enhancing deployment
- The project model will be evaluated by the awardee and managing agency; full documentation is required
- Pilots are unproven concepts needing up to three years for model validation
- Coordination between similar topic area projects will be conducted to assure common protocols and standard applications

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS Project Models

- Technical Strengths
  - World Class Technology Resource Network
  - State Extension Resource for Reuse and Waste Minimization
  - State-led Cooperation Among Previously Competing Service Providers
  - Manufacturing Assistance to Groups of Companies
- Prime-Supplier Interactions
  - Public Nonprofit Product Development/Marketing Network
  - Reconfigurable Customer/Supplier Partnerships
  - Regional, Supplier-Specific, Communication Tool
- Harmonize Quality Requirements
  - Multi-State OEM/Supplier Quality Network

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS

| APPLICABLE  |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technical Strengths of Small Businesses                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Interactions between Private and Public, Including Cultural Factors |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Harmonize Quality Requirements on Suppliers                         |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| World Class Best Practices  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Small Company Incubators  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Dual-Use Technology Applications                                    | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |

P. 2

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

EVALUATION CRITERIA: Target Population

REFERENCE EXAMPLE: Regional Network of Suppliers

RATING: Excellent

**RATIONALE:**

- Three prime contractors that are served by a common supplier base in a defined geographical region join with the Department of Commerce of the state in which they are located and a group of 30 suppliers to propose a set of activities which will simplify and rationalize the requirements placed by the prime contractors on their suppliers. The proposal was rated Excellent because:
  - The target population is well defined and applicable to several prime contractors
  - The demographics of the target population are similar in that they have a common customer base and serve a common geographic region
  - It addresses the needs of the target population through development of simplified and rationalized requirements from their customer base

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

EVALUATION CRITERIA: Target Population

REFERENCE EXAMPLE: Supplier Chain

RATING: Above Average

**RATIONALE:**

- Contractor XYZ and a group of its principal suppliers are to implement a system of electronic commerce for business and product description activities. The proposal was rated Above Average because:
  - A significant group of suppliers (50) are contained in the target population
  - The demographics of the target population are well defined, i.e., suppliers to XYZ

The proposal rating was reduced because

- It fails to demonstrate an understanding of the needs of the target population, i.e., dictates solution without establishing the need

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

EVALUATION CRITERIA: Defense Conversion, Dual-Use Impacts

REFERENCE EXAMPLE: Prime Contractor-Supplier Integration

RATING: Above Average

**RATIONALE:**

- Prime contractor establishing dual-use teaching factories for suppliers. The proposal is rated Above Average because:
  - Prime contractor assists dual-use suppliers in establishing a strategic business plan
  - Prime contractor will financially assist supplier in achieving plan's goals

The proposed rating was reduced because:

- Training in commercial practices not provided to suppliers by prime
- Quality technologies not emphasized

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

EVALUATION CRITERIA: Technology Sources

REFERENCE EXAMPLE: Regional Network of Suppliers

RATING: Excellent

**RATIONALE:**

- Three prime contractors that are served by a common supplier base in a defined geographical region join with the Department of Commerce of the state in which they are located and a group of 30 suppliers to propose a set of activities which will simplify and rationalize the requirements placed by the prime contractors on their suppliers. The proposal was rated Excellent because:
  - The in-house expertise of the prime contractors and suppliers provides an excellent capability to simplify and rationalize requirements
  - The project can be completed without the need for external technology sources or consultants

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

EVALUATION CRITERIA: Delivery Mechanisms

REFERENCE EXAMPLE: Electronic Commerce

RATING: Very Good

RATIONALE: University and non-profit consortium proposes to develop a system for electronically linking small firms with large customers. Proposal is rated Very Good because:

- Letters of commitment executed with 6 major manufacturers and 30 suppliers
- Participating manufacturers have instituted paperless systems in their factories

The proposal rating was reduced because:

- It did not include a demonstration

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

EVALUATION CRITERIA: Delivery Mechanisms

REFERENCE EXAMPLE: Regional Network of Suppliers

RATING: Above Average

RATIONALE: An alliance of multiple prime contractors, the Department of Commerce of the state, and 30 suppliers proposes to standardize and streamline flow down requirements and introduce best manufacturing practices. Proposal was rated Above Average because:

- Prime contractors have established in-place vendor network programs
- Proposed standardization and streamlining will improve quality, reduce cost and increase competitiveness

The proposed rating was reduced because:

- It did not recognize the significant impact of mandatory government specification requirements nor include a plan to address them

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

EVALUATION CRITERIA: Delivery Mechanisms

REFERENCE EXAMPLE: Supplier Chain

RATING: Below Average

RATIONALE: Prime contractor establishing an electronic link with 50 suppliers for business and product data. Rated Below Average because:

- Company has not demonstrated a capability in this area
- No evidence of commitment of suppliers to participate
- Resulting systems will be considered proprietary

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

EVALUATION CRITERIA: Management Experience and Plans

REFERENCE EXAMPLE: Regional Network of Suppliers

RATING: Above Average

RATIONALE: Three prime contractors that are served by a common supplier base in a defined geographical region join with the Department of Commerce of the state in which they are located and a group of 30 suppliers to propose a set of activities which will simplify and rationalize the requirements placed by the prime contractors on their suppliers. The proposal was rated Above Average because:

- Leadership is provided by three prime contractors which have extensive experience dealing with suppliers

The proposal rating was reduced because:

- No single management authority is defined

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

**EVALUATION CRITERIA:** Funding, Budget, and Cost Share

**REFERENCE EXAMPLE:** Supplier Chain

**RATING:** Excellent

**RATIONALE:**

- A prime contractor proposes to establish an electronic link with 50 suppliers for business and product data. Proposal is rated Excellent because:
  - Significant portion of budget (75%) flows down to suppliers, product vendors, and third-party technical assistance providers
  - All matching funds are in cash, i.e., no payment in-kind
  - The documented benefits greatly exceed proposed cost (5 to 1)

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

**EVALUATION CRITERIA:** Coordination and Elimination of Duplication

**REFERENCE EXAMPLE:** Commercialization

**RATING:** Excellent

**RATIONALE:**

- A demonstration pilot is proposed to accelerate within Ohio the commercialization of technologies in the electronics industry sector. This proposal is rated Excellent because:
  - Demonstrates a solid understanding of existing state plans and organizations related to technology commercialization
  - Defines working linkages to assure coordination with state agencies
  - Targeted technology sector complements state efforts
  - No duplication of existing state or federal activities

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS EVALUATION CRITERIA

**EVALUATION CRITERIA:** Accessibility of Services & Documentation

**REFERENCE EXAMPLE:** Regional Network of Suppliers

**RATING:** Above Average

**RATIONALE:**

- An alliance consisting of three prime contractors, a group of 30 common regional suppliers and the regional state Department of Commerce have proposed activities to reduce costs by eliminating nonvalue added requirements and introducing best management practices. The proposal is rated Above Average because:
  - A common shared data base information system is proposed
  - Mix of suppliers (large, small, various technologists, etc.) enhances project relevancy for other primes/suppliers
- Proposal rating was reduced because
  - No definitive plan to disseminate project results outside of the alliance

## Aerogel Commercialization Pilot Project

**Model:** Private Sector Commercialization of Federal Lab Technology

| Data  | Objective  |
|---|--|
| <ul style="list-style-type: none"> <li>Defense Dual-Use Assistance Extension Program</li> <li>Primary Team Members:                             <ul style="list-style-type: none"> <li>Aerogel - General Corp., LLNL &amp; LBNL, 5 private sector end users and California &amp; Michigan service providers</li> </ul> </li> <li>Total Cost: \$2.621K</li> <li>Duration: 15 months</li> </ul> | <ul style="list-style-type: none"> <li>Prototype and assess new applications and products using aerogel technologies</li> <li>Commercialize federal lab technology</li> </ul>  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Defense prime deploying federal lab technology</li> <li>Produce product samples for demonstration and testing by private sector end users</li> <li>Disseminate performance and cost data to SMEs through service providers</li> <li>Management by for-profit private sector company</li> </ul>                                  | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Creates new markets for lightweight, high R-value aerogel products in the automotive, aerospace, appliance industries</li> <li>Retains jobs in defense dependent companies</li> <li>Utilizes excess capability at Aerogel facilities</li> <li>Successful commercialization of products from federal lab R&amp;D</li> </ul> |

## The Agile Web Pilot Program

Model: Reconfigurable Customer/Supplier Partnerships

|  |   |
|--|---|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Regional Technology Alliances Assistance Program</li> <li>Primary Team Members: Ben Franklin Center, Agile Manufacturing Forum, TI, BMA, 14 SMEs</li> <li>Total Cost: \$4,358K</li> <li>Duration: 24 months</li> </ul>                       | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Integrate and evaluate agile manufacturing</li> <li>Structured collaboration between large customers and small suppliers</li> <li>Modernize information infrastructures of small suppliers</li> </ul>  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Iterative manufacturing pilots using electro-mechanical assemblies</li> <li>Virtual firms will be formed for different products based on competitiveness</li> <li>Suppliers cooperate to optimize cost, cycle time, marketing</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Expands business of small suppliers in Pennsylvania</li> <li>Improves procurement of repair parts</li> <li>Establishes benchmarks for world class flexible/agile manufacturing</li> <li>Develops robust, internationally competitive SME network</li> </ul> |

## Connecticut Energy and Environment Technologies Deployment Center

Model: State-led Program Focused on Dual-Use Technology Development

|   |  |
|---|--|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Defense Dual-Use Assistance Extension Program</li> <li>Primary Team Members: Connecticut Dept. of Economic Development, Technology for Connecticut, Inc. (TECHCONN)</li> <li>Total Cost: \$2,003K</li> <li>Duration: 24 months</li> </ul>   | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Integrate energy and environmentally based laboratory technologies into products and commercial ventures</li> <li>Deploy high technologies to serve large and rapidly growing markets in energy production and environmental control systems</li> </ul>                         |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Extract technologies from academic, industry, and federal labs for commercialization of gas turbines, fuel cells, batteries, marine propulsion, and monitoring &amp; control</li> <li>Create 10 projects for deploying new technologies</li> <li>Emphasize prototype demonstration projects rather than services</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Revitalizes 863 Connecticut firms with defense related expertise in propulsion and energy conversion</li> <li>Generates several hundred new manufacturing jobs within 5-10 years</li> <li>Establishes technology transfer and development as a method for creating jobs</li> </ul> |

## The Alliance for National Excellence in Materials Joining

Model: World Class Technology Resource Network

|  |   |
|--|---|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Regional Technology Alliances Assistance Program</li> <li>Primary Team Members: Edison Welding Institute, Primes, MITs, BFTC, Universities</li> <li>Total Cost: \$11,105K</li> <li>Duration: 36 months</li> </ul>  | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Create materials joining outreach network for SMEs</li> <li>Validate assessment tools and methods for laser quality joining</li> <li>Disseminate technical knowledge to defense and commercial users</li> </ul>  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Provide state-of-the-art processes and techniques to target population</li> <li>Enhance networks for training &amp; assistance: John's et al &amp; PrimeNet</li> <li>Coordinate with existing service provider networks &amp; supplier networks</li> <li>Led by state technology center with defense and non-defense partners</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Improves joining capabilities of aerospace, automotive, heavy manufacturing in midwest region, California and Connecticut</li> <li>Creates infrastructure for national training and technical assistance</li> <li>Revolutionizes materials joining processes—a \$50B economy</li> </ul> |

## The Deployment of a National Infrastructure for Gear Metrology

Model: Critical Industry Technical Resource Services

|   |  |
|---|--|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Defense Dual-Use Assistance Extension Program</li> <li>Primary Team Members: American Society of Mechanical Engineers, DOE-Y-12, NIST, Penn State</li> <li>Total Cost: \$7,908K</li> <li>Duration: 36 months</li> </ul> | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Assist American industry in improving global competitiveness in the quality assurance of precision manufactured gears</li> </ul>  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Facilitate collaboration within gear industry</li> <li>Conduct benchmarking studies and develop measurement capabilities</li> <li>Technical society manages industry-led cooperative program</li> </ul>             | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Traceable dimensional standards for gear quality with rapid turnaround and low cost</li> <li>Calibration services for all companies in gear industry</li> <li>National quality standards for \$15B industry</li> </ul> |

## Improving Mfg Process in Small & Medium Sized MN Companies

**Model:** Team-Based Methodology for Problem Solving and Process Improvement

|   |  |
|---|--|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Regional Technology Alliances Assistance Program</li> <li>Primary Team Members: St. Cloud State University, MTI, 3M, Technical Colleges</li> <li>Total Cost: \$5,872K</li> <li>Duration: 36 months</li> </ul> | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Improve manufacturing operations of SMEs in central Minnesota</li> <li>Use structured process on-site to increase manufacturing efficiency, quality, and productivity</li> </ul> <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Creates long term plant-wide benefits for Minnesota economy</li> <li>Provides increased productivity, better product quality, and global competitiveness</li> <li>A systems process for implementing effective manufacturing techniques</li> <li>Sends new engineers to new jobs with in-plant manufacturing engineering experience</li> </ul> |
|---|--|

## Kansas Manufacturers Association: A Consortium for Defense Conversion

**Model:** Competitive Network Pursuing New Business

|  |   |
|--|---|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Regional Technology Alliances Assistance Program</li> <li>Primary Team Members: Kansas Manufacturers Association, Mid-America MTC, Wichita State</li> <li>Total Cost: \$2,000K</li> <li>Duration: 36 months</li> </ul> | <p><b>Objective</b></p> <p>Provide cooperative methods for sub-tier SMEs in defense industry to convert from defense to commercial business</p> <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Preserves defense/aerospace capabilities of SMEs</li> <li>Sub-tier manufacturers leveraged into virtual enterprises (horizontal and vertical integration)</li> <li>Expands manufacturing base, maintains employment levels, creates new jobs</li> </ul> |
|--|---|

## Maryland Healthcare Product Alliance

**Model:** Conversion of Advanced Defense Technologies

|   |   |
|---|---|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Regional Technology Alliances Assistance Program</li> <li>Primary Team Members: MD Dept. of Econ &amp; Employment Development, SMDTC, SBCTC, APL, Westinghouse, Fairchild, IBM</li> <li>Total Cost: \$11,366K</li> <li>Duration: 36 months</li> </ul> | <p><b>Objective</b></p> <p>Transfer advanced defense technologies to create viable new healthcare products and businesses</p> <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Provides defense companies access to healthcare markets</li> <li>Retains high quality jobs at defense dependent companies</li> <li>Creates leading-edge healthcare companies in Maryland</li> </ul> |
|---|---|

## Massachusetts Manufacturing Modernization Partnership

**Model:** State-led Cooperation Among Previously Competing Service Providers

|  |   |
|--|---|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Defense Dual-Use Assistance Extension Program</li> <li>Primary Team Members: Massachusetts Exec Office of Econ Affairs, Bay State Skills Corp., Industrial Services Program, Univ. of Massachusetts</li> <li>Total Cost: \$29,642K</li> <li>Duration: 36 months</li> </ul> | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Coordinate and supplement existing technology assistance service providers into a comprehensive state-wide system</li> <li>Strengthen existing industry</li> <li>Retain and upgrade jobs</li> </ul> <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Assists 10,000 firms state-wide with focus on defense dependent industry sectors (e.g. plastics, electronics, metalworking)</li> <li>Creates centralized points of contact for industry access to assistance services</li> </ul> |
|--|---|



## Minnesota Consortium for Defense Conversion

Model: Public Nonprofit Product Development/Marketing Network

|   |   |
|---|---|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Defense Dual-Use Assistance Extension Program</li> <li>Primary Team Members: Minnesota Technology Inc.</li> <li>Total Cost: \$6,301K</li> <li>Duration: 36 months</li> </ul>  | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Diversify business base of defense subcontractors</li> <li>Improve communication for defense primes' subcontractors</li> <li>Improve quality practices of SMEs</li> </ul>                            |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Assess members' core capabilities for new product development</li> <li>Establish electronic network and database of primes' needs and requirements</li> <li>Create information exchange between subcontractors</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Retains jobs by expanding business base</li> <li>Effective, cooperative commerce between defense primes and suppliers in Minnesota</li> <li>Enhance collective ability of consortium members</li> </ul> |

## Recycling Technology Assistance Project

Model: State Extension Resource for Reuse and Waste Minimization

|  |   |
|--|---|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Defense Dual-Use Assistance Extension Program</li> <li>Primary Team Members: Clean Washington Center, National Recycling Coalition, Northwest Policy Center</li> <li>Total Cost: \$10,521K</li> <li>Duration: 48 months</li> </ul>           | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Transform production practices to attain greater materials-use efficiency</li> <li>Reduce waste and increase materials reuse</li> <li>Develop new products</li> </ul>  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Evaluate SME product development and use/reuse of materials</li> <li>Coordinate state-wide delivery system</li> <li>Managed by state with strong industry involvement</li> <li>Collect and disseminate information nationally</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Cost savings and product development for SMEs</li> <li>Clean-up and cost savings for military installations</li> <li>Increases demand for recycled commodities</li> <li>Establishes model for national replication</li> </ul> |

## The New England Suppliers Institute

Model: Multi-State OEM/Supplier Quality Network

|  |   |
|--|---|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Defense Dual-Use Assistance Extension Program</li> <li>Primary Team Members: Bay State Skills Corp. (Massachusetts), 5 State Partners, Industry Associations</li> <li>Total Cost: \$4,186K</li> <li>Duration: 36 months</li> </ul>   | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Establish industry-led New England consortium to help SMEs meet customer requirements</li> <li>Upgrade SME quality practices</li> <li>Strengthen competitiveness of SMEs</li> </ul>  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Create relationships between OEMs and suppliers</li> <li>Harmonize OEM requirements</li> <li>Identify, coordinate and deliver technology and business assistance</li> <li>Managed by industry with support from state</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Improves competitiveness of defense related OEMs and suppliers in 6 New England states</li> <li>Diversifies business base of defense dependent subcontractors</li> <li>Establishes model for coordinating services across state boundaries</li> </ul> |

## Smart Valley CommerceNet

Model: Regional, Supplier-specific, Communication Tool

|  |  |
|--|--|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Regional Technology Alliances Assistance Program</li> <li>Primary Team Members: Enterprise Integration Technologies Corp., Stanford University, BARRNet/WestREN Corp.</li> <li>Total Cost: \$11,996K</li> <li>Duration: 36 months</li> </ul>   | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Deploy electronic infrastructure to modernize Silicon Valley's electronics, software, and information services to:             <ul style="list-style-type: none"> <li>Expedite procurements</li> <li>Reduce cost of goods</li> <li>Allow concurrent engineering</li> </ul> </li> </ul>                                |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Deploy electronic networking technology to primes, OEM's and their suppliers</li> <li>Provide on-line capability for catalogs, product orders, competitive solicitations, and intercompany collaborative engineering</li> <li>Provide application and educational services</li> <li>Free to clients for 18 months</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Strengthens linkage between Silicon Valley businesses, high technology companies, and 1800 defense and commercial companies</li> <li>Diversifies defense dependent businesses and increases competitiveness</li> <li>Models nationally replicable pilot for electronic commerce and engineering data exchange</li> </ul> |

## Xerox CAN Solar Powered Hydrogen Generation Deployment

**Model:** Integration of Previously Developed Federal Technology

|   |  |
|---|--|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Regional Technology Alliances Assistance Program</li> <li>Primary Team Members: Clean Air Now, Xerox, United Technologies, SEA, Praxair, NREL</li> <li>Total Cost: \$2.515K</li> <li>Duration: 13 months</li> </ul>   | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Integrate federally sponsored technology for use in clean-air vehicles and fueling stations</li> <li>Deploy prototype vehicles in California</li> </ul>   |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Integrate existing and pre-commercial technologies to deploy hydrogen in fleet vehicles</li> <li>Use 50% ethanol methanolizer originally developed for submarines and satellites</li> <li>Partners provide key technology and/or other resources</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Provides method for other companies with fleet vehicles to convert to hydrogen power</li> <li>System meets or exceeds anticipated environmental regulations</li> <li>Develops new markets</li> <li>Transitions technology from Navy &amp; NASA sponsored R&amp;D</li> <li>Expedite nationwide deployment of hydrogen as transportation fuel</li> </ul> |

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS Evaluation Criteria

- Delivery Mechanisms
  - Effective Linkages for Project Activities and Target Populations
  - Multiple Techniques Available: Reports, Workshops, Classes, Hands-on Training
  - Intellectual Property Issues Were Nonexistent or Resolved
- Management Experience and Plans
  - Management Organization Was Efficient and Able to Control Funding, Personnel, and Technical Content
  - Critical Companies in the Target Population Had a Visible, Strong Role and Interacted with the Management Team
  - Project Manager Was Experienced in the Role and Had Authority for Project Success

## Technology Deployment Through Manufacturing Networks

**Model:** Manufacturing Assistance to Groups of Companies

|   |  |
|---|--|
| <p><b>Data</b></p> <ul style="list-style-type: none"> <li>Defense Dual-Use Assistance Extension Program</li> <li>Primary Team Members: Winrock International, Metaworking Connection, Inc., Woodworks Inc.</li> <li>Total Cost: \$2,138K</li> <li>Duration: 12 months</li> </ul>  | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>Evaluate manufacturing networks as an institutional structure to promote industrial competitiveness</li> <li>Demonstrate 2 networks' approaches to encourage member-manufacturers to adopt manufacturing technologies</li> <li>Evaluate implications of a demand-driven entrepreneurial approach to technology development</li> </ul> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Benchmarking member manufacturers to understand their strengths and weaknesses</li> <li>Provide in-plant technology demonstrations and assistance to member groups</li> <li>Integrate member companies vertically and horizontally for new product development</li> </ul> | <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>Provides technology assistance to 1200 small manufacturers in Arkansas wood and metal industries</li> <li>Revitalizes wood and steel industries within Arkansas to increase sales and open new markets</li> <li>Demonstrates impact of multi-firm assistance approaches</li> </ul>   |

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS Evaluation Criteria

- Target Population
  - Well Defined Group of Companies to Benefit from Project
  - Survey of Region or Sector Provides Data for Population
  - Members of Population Included on Team and Helped Define the Program Based on Actual Needs
- Defense Conversion, Dual-Use Impacts
  - Included Defense Primes and/or Suppliers
  - Utilized Engineering Expertise to Generate Commercial Markets
  - Assessed Technologies for Commercial Market Share
  - Reasonably Determinable and Realistic Estimates of Project Impacts
- Technology Sources
  - Relevant Existing Technical Sources for the Target Population and Project Objectives
  - Agreements Defined for Technology Access and People Available
  - Sources Are Strategically Located or Accessible to Target Population

## ALTERNATIVE DEPLOYMENT PILOT PROJECTS Evaluation Criteria

TRP 1994

- Funding, Budget, and Cost Share
  - Project Cost Was Reasonable to Meet Objectives
  - Commitment for Cost Share Was Strong: Cash, Dedicated People, Companies, States
  - Plans Included Approaches Leading to Self-Sufficiency
- Accessibility of Services and Documentation
  - Detailed Approach to Provide Easy Access by Target Population
  - Cost Effective Means to Provide Services
  - Pilot Model Evaluation by 3rd Party for Effectiveness
  - Detailed Data and Documentation to be Sufficient for Replication
- Coordination and Elimination of Duplication
  - State and Regional Plans Do Not Conflict
  - Coordination of Activities and Services to Assure Non-Duplication
- Two Competitions this Year
  - Tightly Focused Technology Areas -- Spring
  - Development, Deployment, Manuf. Ed. Areas -- Summer
- Teams Were Better if Management Organization, Program Manager, and SME Roles Were Well Defined
- Project Concept/Plans Must Be Concise, Clear, Well Thought-Out, With Relevant Goals, and Reasonably Priced
- Direct Contact with TRP Team Provided Better Proposals
- Factfinding Trips By Evaluation Team Are Critical

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TECHNOLOGY REINVESTMENT PROJECT

**TRP Successes**

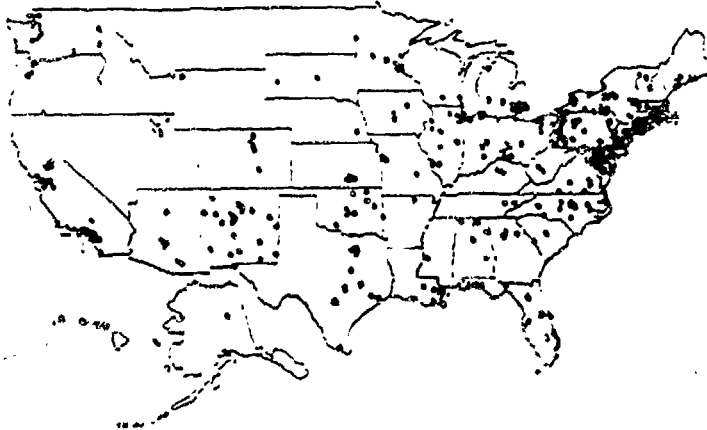
- **Surprisingly Successful Response To Complex Solicitation**
  - Excellent Proposals Exceed Available Funding
- **Successful Start to Integration of Military/Commercial Base**
  - Innovative Dual-Use Programs
  - Workforce Retraining
  - Infrastructure Support
- **Meaningful and Unique Collaboration**
  - Large Well Integrated Teams (Horizontal and Vertical)
  - Gov't, Industry, University Teams
  - Inclusion of Small Businesses
- **Active Participation By State and Local Governments**
  - Regional Alliances
  - State Funding
- **Cooperation Among Multiple Federal Agencies Works!**

TECHNOLOGY REINVESTMENT PROJECT

**Technology Reinvestment Project**

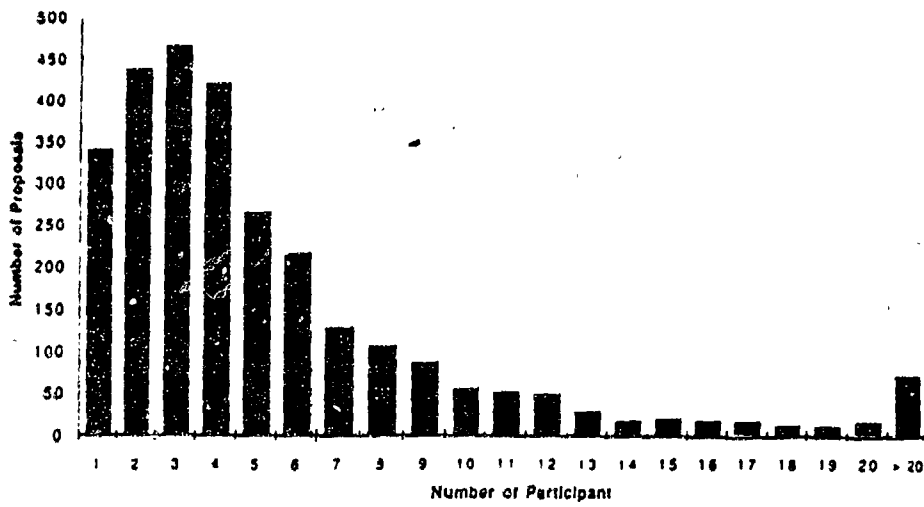
Cumulative Announcements

December 3, 1993



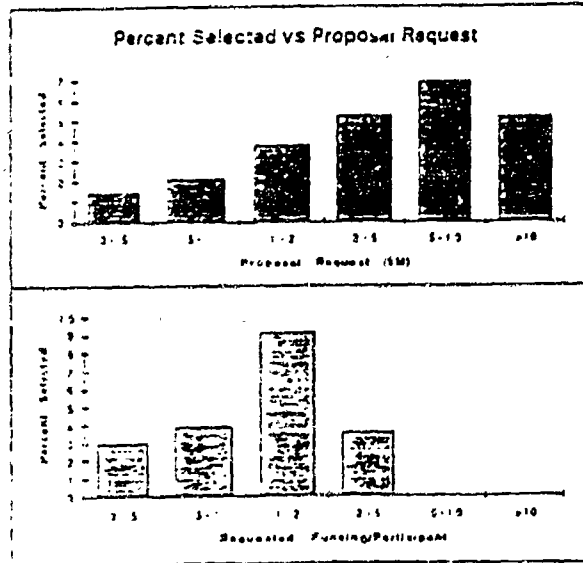


Participants per Proposal



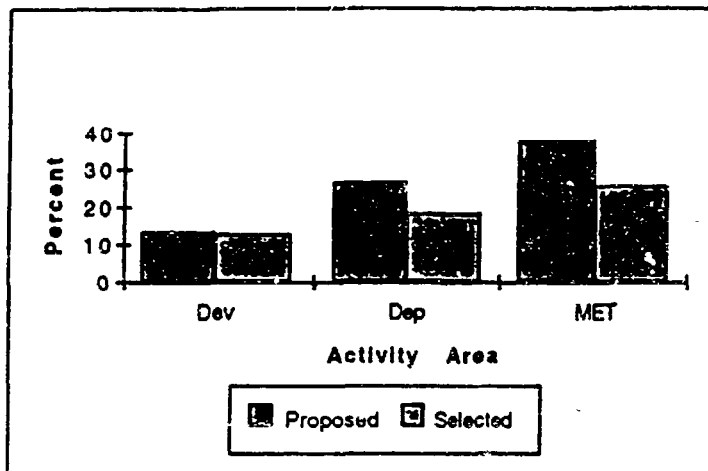
TECHNOLOGY REINVESTMENT PROJECT

TRP Funding Requests



### University Performance in TRP

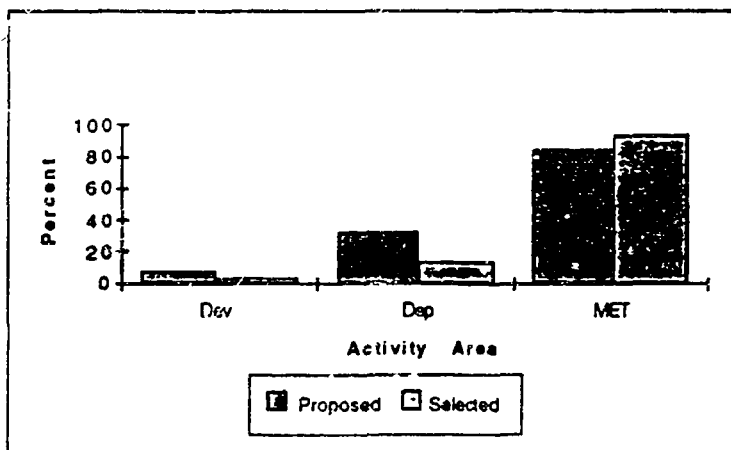
#### Participants



\* Estimated using name search

### University Performance in TRP

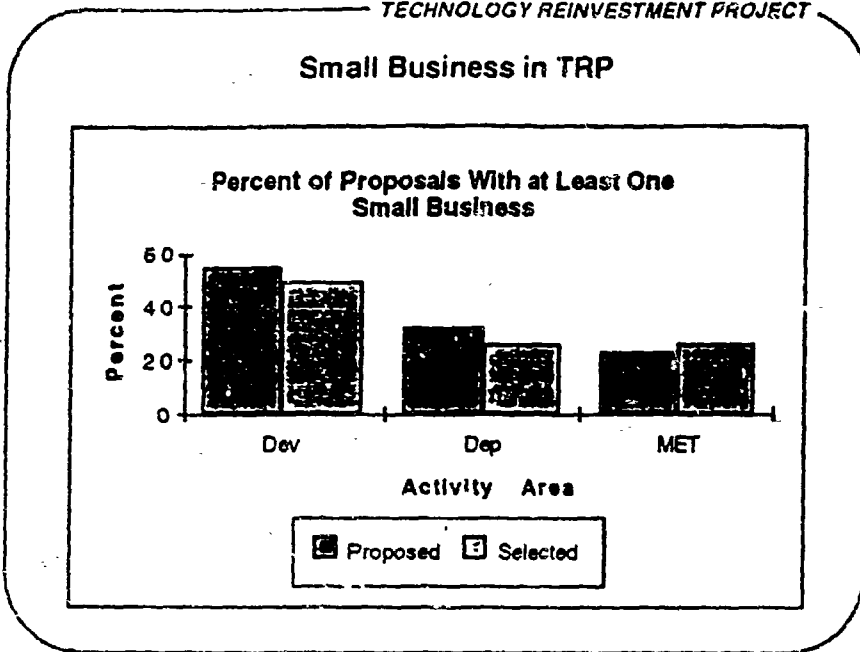
#### Lead Proposer



\* Estimated using name search

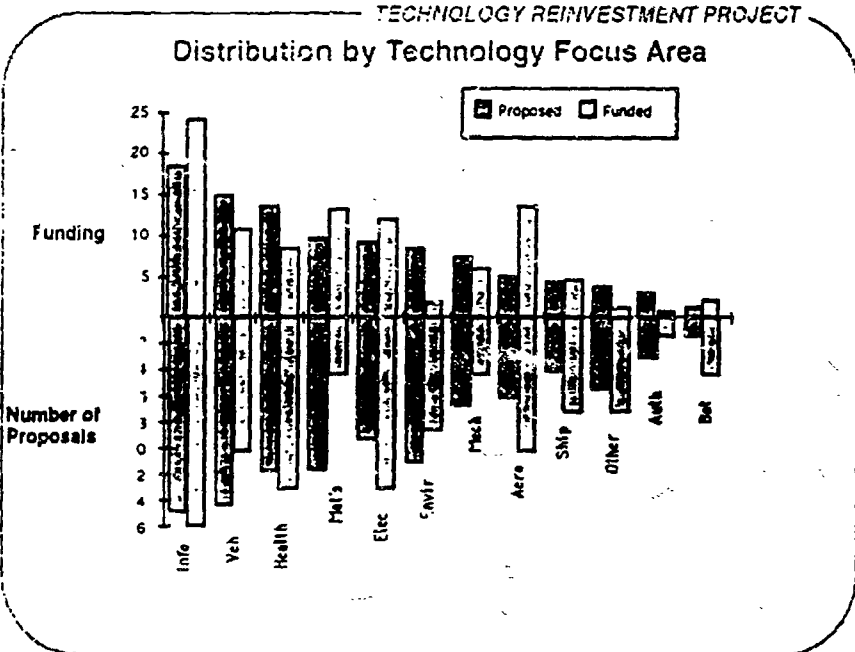
TECHNOLOGY REINVESTMENT PROJECT

Small Business in TRP



TECHNOLOGY REINVESTMENT PROJECT

Distribution by Technology Focus Area



TECHNOLOGY REINVESTMENT PROJECT

TRP - What's Next?

- **Dual-Use, Defense Conversion Will Continue**
  - TRP Statutes Appear to be Well Funded in FY 1994
- **Collaboration, Partnerships, Cost Sharing Still Required**
  - Some Breaks for Small Businesses
- **TRP Options Available**
  - Some FY 94 Funds for FY 1993 TRP Proposals Very Likely
  - Limited FY 94 Competition
    - » Focused in Scope and Technologies
  - Large Competition
    - » FY 94 and/or FY 95

TECHNOLOGY REINVESTMENT PROJECT

Defense FY 94 Appropriations/Authorizations  
(\$1,000,000)

|   | PB  | App   | Auth  |
|---|-----|-------|-------|
| Dual-Use Partnerships                             | 324 | 474   | 524   |
| • Dual-Use Critical Technology Partnership        |     | 150   | 250   |
| • Commercial-Military Integration Partnership     |     | 100   | 75    |
| • Advanced Manufacturing Technology Partnership   |     | 30    | 50    |
| • Regional Technology Alliance                    |     | 100   | 75    |
| • Defense Dual-Use Assistance Extension           |     | 0     | 30    |
| • Manufacturing Extension Service Providers       |     | 0     | 30    |
| • Defense Manufacturing Engineering Education Pgm |     | 24    | 24    |
|   |     | (404) | (524) |
| • Agile Manufacturing/Enterprise Integration      |     | 35    | 50    |
| • Advanced Material Partnership                   |     | 30    | 30    |
| • United States-Japan Management Training Program |     | 5     | 10    |



# TABES 94

10th Annual

**Technical and Business  
Exhibition and Symposium**

**May 10 - 11, 1994  
Von Braun Civic Center  
Huntsville, Alabama**

**HELPING SMALL COMPANIES  
COMMERCIALIZE PUBLIC-SECTOR  
TECHNOLOGY**

BY

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No. 94- 407**

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