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DEFENSE CONVERSION

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BEFORE THE

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ONE HUNDRED SECOND CONGRESS

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DEFENSE CONVERSION

THURSDAY, APRIL 9, 1992

CONGRESS OF THE UNITED STATES,
JOINT ECONOMIC COMMITTEE,
Washington, DC.

The Committee met, pursuant to notice, at 9:21 a.m., in room SD–106, Dirksen Senate Office Building, Honorable Paul S. Sarbanes (Chairman of the Committee) presiding.

Present: Senators Sarbanes and Bingaman.

Also present: Stephen A. Quick, Executive Director; Dorothy Robyn; Susan Lepper; Mark Forman and Robert Cresanti, professional staff members.

OPENING STATEMENT OF SENATOR SARBANES, CHAIRMAN

SENATOR SARBANES. The Committee will come to order.

Today, the Joint Economic Committee is meeting to examine how the Federal Government could help to prepare defense workers, defense firms and communities for lower defense spending.

The end of the Cold War means that some shifting of resources from military to civilian uses is inevitable. The question for economic policies is how to ensure that the transfer minimizes economic disruption while building a strong foundation for economic growth in the future.

The nation has faced similar challenges in the past. After World War II, record high levels of defense spending and war production were reduced rapidly. Despite the speed and magnitude of the cutbacks, the adjustments proceeded smoothly.

In contrast, the builddowns following the wars in Korea and Vietnam were less dramatic. Yet, in each instance, the adjustment was more difficult.

Vietnam veterans and Vietnam-era engineers, for example, paid a high price with high unemployment and other difficulties, some of which are still being felt, even today.

Two lessons seem to emerge from our past experience. The first is that conversion can proceed much more smoothly in a climate of rapidly expanding domestic demand. The second is that the conversion process can be improved by government policies designed to assist firms, communities and workers with the task of shifting to new forms of production.

Unfortunately, in today's economy, neither of these preconditions for successful conversion is very much in evidence. In fact, the consensus forecast amongst economists is for unusually slow growth in domestic demand in the year ahead, and the Administration, to date, has failed to come forward with a comprehensive plan for assisting the conversion process.

This combination of weak overall economic growth and no overall conversion policy seems more likely to produce a difficult adjustment, similar to post-Vietnam and post-Korea, than the most successful conversion which followed World War II.

Today, we have two panels of witnesses to discuss the nature and magnitude of the current and planned defense cuts, the lessons to be learned from previous conversion experiences, whether existing programs and policies to deal with conversion are adequate, and the possibilities for new or additional programs and policies.

On the first panel, we will hear from Katherine Gillman, senior associate of the Office of Technology Assessment and project director of the study, "After the Cold War: Living with Lower Defense Spending." And Robert Atkinson, senior analyst in the Office of Technology Assessment.

The OTA report that they will be discussing concludes or indicates that current federal adjustment programs are insufficient to the task ahead of us.

They will then be followed by a panel consisting of: Ethan Kapstein, Don Fuqua, Daniel Flaming and Brian Bosworth.

We are very pleased to have this distinguished collection of experts with us. I will turn now to Katherine Gillman, first yielding to Senator Bingaman for any comment he may have.

OPENING STATEMENT OF SENATOR BINGAMAN

SENATOR BINGAMAN. Thank you, Mr. Chairman. I compliment you for having the hearing.

I was sitting here thinking. I listen to "Car Talk" on Saturdays. Do you ever listen to that show?

SENATOR SARBANES. Once in a while.

SENATOR BINGAMAN. They have this great list of credits they give at the end, where they say, we want to thank our legal counsel, Dewey, Cheetham & How, and they go through this whole list.

The list includes — we also want to thank our director of long-term strategic planning, Kay Sera.

[Laughter.]

It seems to me that that's appropriate for what we're faced with these days on defense conversion. We don't seem to have any long-term strategic planning going on.

I think the report that OTA did is a very good piece of work, and I am looking forward to the testimony.

SENATOR SARBANES. Very good.

Katherine, we would be very happy to hear from you.

STATEMENT OF KATHERINE GILLMAN, SENIOR ASSOCIATE, OFFICE OF TECHNOLOGY ASSESSMENT

Ms. GILLMAN. Thank you, Mr. Chairman, members of the Committee, and Senator Bingaman. We are happy to be here. Thank you for giving us the opportunity.

I want to go over briefly the major findings of the report, about the magnitude of the problem and what we can do about it.

First, we're facing a really big cutback in defense spending, perhaps to the lowest level in 40 years. Although it will be big in dollar terms, it will not be as big in relation to the size of the economy as some of the cutdowns we have experienced in the past, including the one that is the most recent and the most similar, the one 25 years ago after the Vietnam War.

However, that doesn't mean that the transition is going to be easy. Hundreds of thousands of workers face a difficult transition, many communities are defense-dependent, and many defense companies will have to change to more commercial production, or shrink, or perhaps even go out of business.

So we do face some serious problems. They're all aggravated by the fact that we have had a very long recession, and even though it's technically over, unemployment is still rising, and we seem to be facing a period of stagnation or very slow growth. That adds to the difficulties of all of our adjustment problems.

Let's go over briefly what we think about the size of the adjustment. If we have long, sustained cuts in defense spending, we could perhaps get down to a level of about $170 billion in DoD spending by the year 2001. That implies, according to our estimates, a loss of about 2½ million defense-related jobs. That averages out to 250,000 a year.

Let's compare that with the Vietnam War.

At that time, we ——

SENATOR BINGAMAN. I would ask for a clarification.

Ms. GILLMAN. Sure.

SENATOR BINGAMAN. You're talking about 2½ million jobs in the civilian sector, in addition to the people turned out of uniform.

Ms. GILLMAN. No, that's all of them.

SENATOR BINGAMAN. That's everybody?

Ms. GILLMAN. That's people in the active duty armed services, it's civilian employees of the Department of Defense, and it's people who are employees of the private defense industry.

SENATOR BINGAMAN. Okay.

Ms. GILLMAN. I should say that we think that not that many people will actually lose jobs because some of the shrinkage will be taken care of by attrition, particularly in the active duty armed forces.

Congress has mandated a reduction of 500,000 in the armed forces between 1990 and 1995. Of that, 100,000 has already been accomplished, mostly through attrition. And the DoD expects that not more than 100,000 overall, over the whole five years, one and a half of which have already passed, will be involuntary separations. A certain amount of attrition will take care of some of the job losses in the civilian economy, too.

Now, let's look at what happened after the Vietnam War. In eight years, there was a decline of over 3 million in defense-related jobs, including that whole range. That was an average of over 400,000 a year, compared to 250,000, on average, over the next ten years.

That's the good news.

The bad news is that our economy is in much worse shape to tolerate these kinds of losses. Not only is there the recession which we hope will lift, but our economy is not as strongly competitive as it was 20 or 25 years ago.

The private defense industry jobs are strongly tilted to manufacturing, and we are not opening up new manufacturing jobs, on the whole. Instead, we are losing manufacturing jobs. Over the past dozen years, we have lost 2½ million manufacturing jobs.

It's hard for people who have been in manufacturing to change to other sectors. We know that from several studies of displaced workers.

An other difficulty is that defense activities are concentrated in certain states and within those states, in certain communities that are highly defense-dependent. Many of those face very difficult problems.

We are finding that in this long-lasting recession, even local economies that are large and diverse are having trouble with defense downsizing. Los Angeles, in particular, has an unemployment rate way above the national average, 8.5 percent compared to a bit over 7 percent, because they've been hit not only with declines in aerospace employment, but also a lot in construction and finance.

And then there are smaller places that certainly are at risk, such as southeast Connecticut, where the Electric Boat and other submarine activities are concentrated, and a place like Bath, Maine, with its big shipbuilding yard that builds only for the Navy.

What can we do about all this?

We discussed in our report two approaches. One is adjustment programs. That's an immediate kind of response. You have re-employment and retraining programs for workers. You have economic development assistance for distressed communities.

There's another set of programs that is not just a short-term adjustment fix, but helps to raise the level of performance in our economy and promises some long-term payoffs in higher productivity, higher

wages, and better incomes for all Americans. Those are the programs that help companies perform better in the commercial world.

Many of the large defense companies are not too interested in large-scale conversion from defense to commercial activities, although some of them are getting a toe in the water and using some of their technologies, especially electronics and communications, to get into nondefense applications.

There's also a population of small manufacturing companies – 350,000 of them — many of which are already dual-use. They do both commercial and defense production, and there are government programs that can help them get into more commercial production. These are the very same kind of programs that can help all of our smaller manufacturing firms do a better job.

Rob is going to talk about that, so I won't go into more detail. But those are the kinds of programs that help to lift the whole level of our performance and our economy.

Let me say a few words about our adjustment programs.

Of course, they work better when the economy is growing and creating jobs. They don't work as well when the economy is shrinking and losing jobs. And that's the situation we have been in for the last couple of years.

But adjustment programs do help when local and national economies are creating jobs. The federal adjustment program for workers is the JTPA Title III program, or the EDWAA — the Economic Dislocation and Worker Adjustment Assistance program — which has been in existence for ten years, has a lot of experience, and has made some modest successes. But it still has some problems.

It is a federally funded program that operates at the state and local level and is very uneven in quality and performance. For example, probably the best measure of the quality of performance of these dislocated worker programs is how fast they provide a genuine, helpful, full-range of services. If they can do it before the workers are laid off, that gets the best results.

Just a handful of states do a really good job of rapid response. We believe that the federal role in raising their performance is to provide guidance, technical assistance, information-sharing, and a collegial and helpful continuing exchange of information and not an adversarial posture toward the states and localities that run this program.

The Federal Government itself has control of some of the EDWAA funds, but some bureaucratic impediments at the U.S. Department of Labor stand in the way of getting these funds out to where they're needed rapidly.

Let me say a word about EDWAA funding. It is higher than it has been in the past, around $540 million this year. In addition, Congress provided an extra $150 million especially for defense workers.

The regular EDWAA funds are being eaten up very fast because of the recession and high unemployment, which is still rising despite the technical end of the recession.

There's a tremendous demand for EDWAA services. The extra $150 million which Congress provided is not getting out fast enough because of the bureaucratic impediments I mentioned.

Community economic development aid is in worse shape at the federal level than displaced worker assistance. The states have taken the lead in community economic development for the last 15 years, mainly because the Federal Government has withdrawn and retracted in that area.

Our major federal program is the Economic Development Administration in the Department of Commerce. EDA has a small regular appropriation for distressed communities, but Congress has provided them some additional money — $50 million to be spent in 1991-93. These funds that are earmarked for distressed defense communities for the most part have not gotten out to the communities. I think, maybe, there has been one grant so far from the extra funds that Congress provided.

EDA needs to turn around faster, to get their money out faster. Rob will talk some more about community economic development, so I will pass that one along to him.

There's another range of possible federal actions that we didn't discuss in our report after the Cold War. We are analyzing them for our next report. We will discuss the possibility of creating new national programs that meet public needs that have been neglected for many years while we concentrated on our national security needs.

There are programs that can both meet public needs, such as cleaning up the environment, or creating better transportation and communication infrastructures, that also have the very beneficial effect of developing industries that are knowledge-intensive and wealth-creating; the kind of industries that we want because they're capable of advancing knowledge and raising the income of all Americans.

This is something that we haven't analyzed yet, but we hope to present this report to the Congress early next year. Certainly, there's promise in programs like that to raise the whole level of our economy and make us smarter and richer in the long run.

Thank you.

STATEMENT OF ROBERT ATKINSON, SENIOR ANALYST, OFFICE OF TECHNOLOGY ASSESSMENT

MR. ATKINSON. Thank you. I want to talk briefly about how the Federal Government could play a role in helping defense-dependent communities and states respond to the builddown.

As Kitty mentioned, states and localities have been quite active in economic development for about 15 years. Unfortunately, much of what they do still is industrial recruitment. There are more and more states that are joining this.

One of the problems with this, in terms of trying to get other firms, either foreign or domestic, to move into their area, is that the size of the incentives that the states and localities are having to provide now are increasing to astronomical amounts.

For example, the State of Minnesota recently provided $700 million to Northwest Airlines for them to maintain their facility and some maintenance facilities in Minnesota. That's $700 million that could be used instead for education, training, public infrastructure and the like, but now won't be able to be used for that.

That problem is particularly onerous in regard to our foreign competitors. We have estimated that in the past 15 years, U.S. states and cities have provided almost a billion dollars to Japanese auto firms in order to induce them to locate in particular states in the United States.

We think that more effective approach for states and localities to use in terms of responding to economic distress, in particular, the defense builddown, is to focus their attention on helping existing firms within their borders become more competitive. And in particular, the 355,000 small- and medium-sized manufacturing firms.

The good news is that many states already have such programs to help these firms become more competitive. Not only just defense firms, but also civilian firms. These programs include such things as manufacturing extension programs, where engineers will go out and help firms adopt new automated, state-of-the-art technologies and training programs, where they'll help train the workers on these new technologies, export development to help firms seek out new foreign markets, and the like.

In many ways, states are best positioned to provide these types of services to our small- and medium-sized manufacturers. Oftentimes, they are close to the customers. They understand the small- and medium-sized business needs.

Unfortunately, these programs are generally small and they are underfunded. As a result, there's a role or a need for federal support of these state industrial service programs.

In the last few years, there have been a few federal efforts to help small- and medium-sized manufacturing firms. The manufacturing technology centers, or the Hollings centers, have been set up. There's a small program in NIST — the National Institute of Standards and Technologies — that provides grants to the states for these types of efforts.

Unfortunately, these programs are quite small. In terms of the size of the need that's out there, these programs could be expanded.

One approach that this might take would be a form of multiyear grants provided by the Federal Government to states to operate

comprehensive technology and manufacturing extension programs that would include assistance in the adoption of new technologies, work force training, market intelligence, new technology development, and also networking or cooperative relationships between firms.

I will close on one note.

For example, one area in Florida — the Florida Panhandle — has developed a program to work with its small- and medium-sized defense producers, many of them who are either in some commercial markets already or are looking to get into more commercial markets. They've developed a program called Florida Technology Coast Manufacturing and Engineering Network, which tries to link these defense producers together in what's called an industrial network, in which the model has been borrowed from some of the European nations for them to develop new products to do joint defense and commercial bids, which one firm might not be able to bid on alone, to share information, to develop training programs, and the like.

While this is a new program, most of the firms down there are quite happy with it and are glad that they're involved in it.

Unfortunately, these are isolated efforts around the country and more of them could be developed.

Thank you very much.

[The prepared statement of Ms. Gillman and Mr. Atkinson follows:]

PREPARED STATEMENT OF KATHERINE GILLMAN AND ROBERT ATKINSON

Mr. Chairman and members, we appreciate the opportunity to appear today and discuss the effects of the post-Cold War defense build-down on defense workers, communities and companies. Our comments are based on our recent report to the Congress, After the Cold War: Living With Lower Defense Spending and also draw on OTA's previous work on manufacturing competitiveness and worker training.[1]

With the end of the Cold War, the nation is now free to make big cuts in defense spending--maybe to the lowest level in 40 years. Though the cuts will be smaller in relation to the size of the economy than they were in past defense build-downs, this transition will not be painless. Hundreds of thousands of defense workers will lose their jobs, and some could face serious hard times. So could scores of defense-dependent communities. Many defense companies will have to find ways to succeed in commercial markets, or else shrink, or perhaps go under.

The recession and high unemployment have aggravated all of these problems. And even when times get better, we still have an economy that is basically less robust than it was in earlier defense build-downs. We will continue to face tough international competition, especially from the Japanese, and it is going to be hard to replace the well-paid manufacturing jobs that defense has provided.

Government programs can help workers, veterans, and communities get through the transition, and can offer various kinds of aid to defense companies that want to shift into more commercial production. Some of these programs can give a real boost to technology advance and improved competitiveness. But by and large, adjustment

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[1]These include Paying the Bill: Manufacturing and America's Trade Deficit (June 1988), Commercializing High-Temperature Superconductivity (June 1988), Making Things Better: Competing in Manufacturing (February 1990), Worker Training: Competing in the New International Economy (September 1990), and Competing Economies: America, Europe, and the Pacific Rim (October 1991).

programs can only go so far. It takes healthy growth in the national economy to open up solid new opportunities to laid-off defense workers and defense-dependent communities.

Jobs are at the heart of concern over defense spending cuts. What are the employment impacts likely to be? In 1991, about 6 million people were employed in defense industries, the active duty armed forces, and civilian jobs with the Department of Defense. That was just over 5 percent of the 119 million Americans at work that year. If we have big, sustained cuts in defense spending, as many as 2.5 million defense-related jobs could be gone by 2001.[2] That averages out to about 250,000 a year--a substantial number, but still only about two-tenths of one percent of the employed work force.

Of course, the size of this adjustment pales in comparison with the transition after World War II, when 25 million people, out of an employed labor force of 65 million, left defense-related employment in the 4 years from 1944 to 1948. But there are many differences between that conversion and the one we face now. The term "reconversion," which was used then, sums up one difference. There was no large, permanent defense industry then as there is today, after 40 years of cold war. Civilian production and jobs were the norm for nearly everyone. And the extremely generous GI Bill helped more than a million veterans improve their skills and reenter the labor force gradually.

A closer comparison is the situation after the Vietnam War. In the 8 years from 1968 to 1976, 3.3 million defense jobs disappeared. That is over 400,000 jobs per year, compared to the 250,000 per year that could disappear over the next 10 years. Keep in mind too that the employed work force 20 years ago was about two-thirds of what it is now. Another positive note: not all the loss of defense employment translates into

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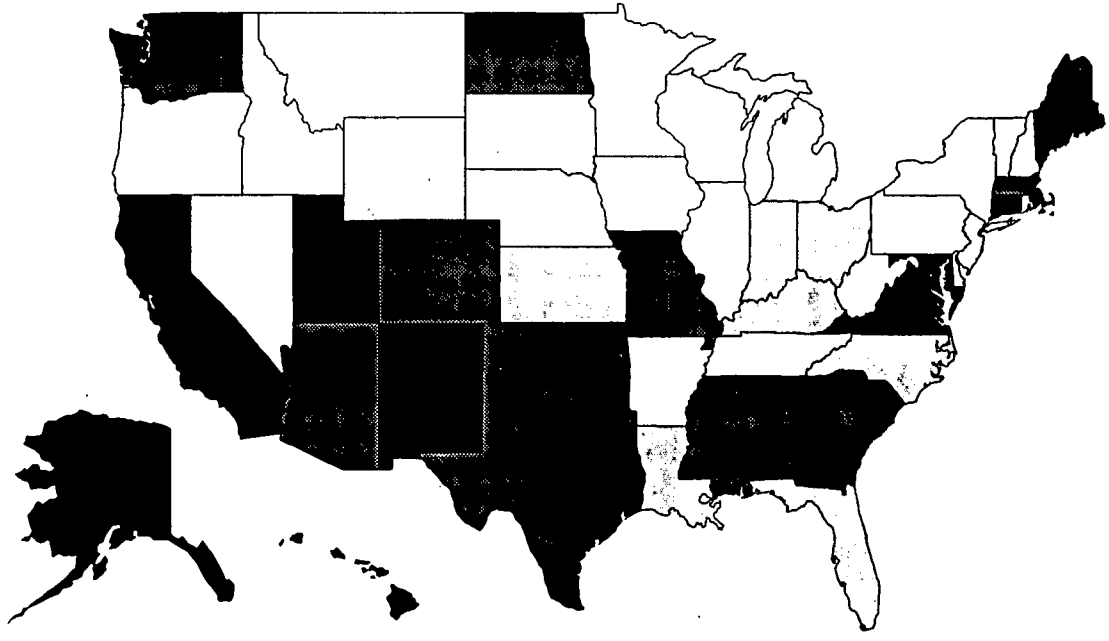
[2]This estimate is based analysis by the Brookings Institution authors William Kaufman and John Steinbruner of the nation's future defense needs. They suggest that by 2001 DoD spending might be as low as $169 billion, or 42 percent less than 1991 outlays.

Percent of State Employment in Defense, 1991



- 5.9 percent or more
- 4.3 to 5.8 percent
- 3.0 to 4.2 percent
- less than 3.0 percent

people actually getting laid off. The armed services expect to handle most of their downsizing though attrition, which will take care of some of the civilian defense job loss too.

On the negative side, job losses that the nation can tolerate when the economy is growing and creating new jobs are much harder to take in a time of recession or stagnation. In the 1970s, the United States had net growth of over 20 million jobs, and in the 1980s, about 18.5 million. In the past year and a half, far from adding jobs, we lost them--more than a million from mid-1990 to the end of 1991.

Moreover, the cutbacks don't affect the whole country equally. Eight of the states are much more dependent on defense than the average (see the accompanying map). Within the states, certain communities are unusually vulnerable--we estimate that about 160 of the nation's 3,137 counties are highly dependent and could be hard hit. Even some large, diverse local economies that were fairly resistant to economic downturns in the past are suffering from defense layoffs. Unemployment is far above the average in Los Angeles-Long Beach, which has been hit with triple blows in aerospace, construction, and finance. Smaller communities--like Bath, Maine, with its shipyard that builds exclusively for the Navy, or the southeast Connecticut-Rhode Island area where submarines are the staff of life and one out of five jobs are directly defense-related--are perhaps still more at risk.

Besides the numbers involved, the kinds of jobs that defense provides are better than average. Nearly 60 percent of defense industry jobs are in manufacturing. For blue and pink collar workers, manufacturing jobs pay better than service sector jobs, but they will be hard to find in the civilian sector. Over the past dozen years, the nation has lost 2.5 million manufacturing jobs. Many of the jobs we've created have been skewed toward services with low pay, skimpy knowledge generation, and not much future. It may also be hard to replace the military as the nations's top equal-opportunity employer and DoD as a prime supporter of technology advance.

Our report After the Cold War: Living With Lower Defense Spending, is the first of two in OTA's continuing assessment of technology and defense conversion. It is mainly about adjustment programs for workers, communities, and companies. The second and final report will focus more on opportunities to redirect technological and human resources into building a stronger commercial economy. A companion OTA project is analyzing future U.S. defense needs and the industrial base that will be required to meet them.

Keeping in mind that the foremost need for coping with defense cutbacks is a healthy, expanding economy, we found that several existing Federal adjustment programs could help in the transition, if they are improved in quality and if their funding proves sufficient. The major Federal program to help displaced workers find new jobs or train in new skills is the Economic Dislocation and Worker Adjustment Assistance (EDWAA) program. It has 10 years of experience, a moderately good record in placing participants, and more funds than it has ever had before--$577 million in this fiscal year, plus another $150 million earmarked for displaced defense workers over three fiscal years 1991-93. However, the funds may still not be enough because unemployment is still rising and that is creating huge demands for services.

As for quality, EDWAA's record is uneven. State and local agencies run the program, and a few of them do an outstanding job, but many fall below that level. Stronger technical assistance and information sharing--a Federal responsibility--could help raise the performance in the States that are not doing so well. A major weakness is failure to provide services soon enough after workers get notice of layoff. Delays happen all along the line, from the local level through State offices, up to the U.S. Department of Labor, which controls a portion of EDWAA funds and doles them out in response to proposals. Streamlined administration of these requests would help to get the funds out quickly to where they are needed.

Members of the armed forces who may be separated when they want to stay on are a group of special concern. In downsizing from 2.1 million in 1990 to 1.6 million by 1995, DoD estimated that there might be as many as 100,000 service men and women involuntarily separated, 30,000 officers and 70,000 enlisted personnel. The benefits package for these people--separation pay, transition services, education allowances--is better than benefits available to displaced defense industry workers, and bills now before the Congress would add more opportunities (e.g., early retirement for veterans who choose to train for certain socially beneficial jobs, such as teaching). For some veterans--those with lower skill jobs in the services--it still will not be easy to make the transition to civilian life. Possibly the biggest losers, however, will be young minority males who will not have the chance to join the smaller armed forces. Right now, over 10 percent of employed young black men between the ages of 18 and 28 are in the military forces; that compares with 5 percent of young white men.

Another group of special concern is engineers, because they are a valuable national resource. In the first big waves of defense layoffs, over the last couple of years, engineers have been first in line to go. Some of them have had real trouble getting new jobs--especially older engineers, those who have moved into middle management positions, and non-degree engineers--technicians who have been promoted within the company. So far we have not seen the disastrous regional unemployment for engineers that happened after the Vietnam War. At least up till late last year, engineers were still following their tradition of scouring the country for jobs, and eventually--often months later--finding them. Although many defense engineers have proved themselves versatile enough to enter civilian jobs, a substantial number could benefit from the kind of continuous education, or mid-career retraining, that has been advocated for years but is not widely available.

Even though the number of communities at serious risk is not overly large, Federal programs to help them recover are probably not sufficient. The main program at the Federal level is the Commerce Department's Economic Development Administration (EDA), and it is not in good shape. It has been threatened with extinction and starved for funds for a decade. In the 1980s, many States and communities developed some creative economic development programs, but today some of the best are slashing their programs because of budget crises.

Congress gave EDA an extra $50 million in DoD funds over 3 fiscal years to help defense-dependent communities; the regular funding for this program in fiscal year 1992 was $12 million. However, it took over a year just to get the funds transferred and there will probably be still more delay in getting the money out to communities that need it. EDA is slow--sometimes it takes years to respond to requests for help. DoD has a small office that helps communities affected by defense cutbacks, the Office of Economic Adjustment. It has a good record of fast response, but its services stop with planning. Also its experience is mainly with military base closures, which are generally less disruptive than defense plant shutdowns. A main reason is that military bases are usually not as closely tied to the local economy as are defense plants. There are exceptions; some places just haven't much else in their economy but the local military base; Aroostook County Maine, for example, with Loring AFB or Leesville, LA, with Fort Polk. And a general problem with military base closures is that disposal of the land and property is slow, which hampers communities in planning for base re-use and alternative economic development. One of the major reasons for delay is the environmental cleanup that many bases require. One possible answer is to allow communities or private users to lease the clean part of the property while cleanup continues on the polluted parts.

Federal help to defense-dependent communities will work best if it is delivered early, if it is targeted to communities most in need and if it supports and supplements State programs. A constructive function the Federal program could serve is to encourage communities to focus on offering companies business assistance programs that help them grow, instead of trying to lure them with tax subsidies and giveaways.

What about conversion of defense companies to commercial activities? Most of the big prime defense contractors do not plan large-scale conversion, using the same workers at the same sites. Many of them say they don't know how to produce and sell in commercial markets, and they're just going to stick to defense, and shrink as much as necessary. However some of them--especially the ones that make components and subsystems rather than final products--are looking for nondefense customers--usually government agencies first. For example, Martin Marietta is the overall integrator of the FAA's $16 billion upgrade of weather and air traffic systems, and is making automatic mail sorting machines for the Post Office. Some are even getting a toe in the water in commercial markets--using sensors developed for the military in home or office security systems, for example.

Many small and medium-size companies selling to DoD or its prime contractors are already dual use producers. Technical, marketing, or financial assistance from government programs could help some of them shift into more commercial activities. In fact, this kind of program might be open to all small manufacturing firms; it has the potential for giving a real boost to our industrial performance. States are ahead of the Federal Government in providing industrial services to small manufacturing firms. One option is to expand the small Federal program of Manufacturing Technology Centers, operated by the National Institute for Standards and Technology and currently funded at about $15.7 million. Another is to provide substantial Federal support for State programs that offer a wide range of services to improve companies' performance,

possibly in one-stop centers that include assistance with new product development, financial needs, marketing, worker training, and manufacturing process modernization. Another approach is government-industry partnerships to develop risky new technologies with commercial potential. This too is the kind of thing that could have a long term positive effect in raising productivity and helping to create new knowledge-intensive, wealth-creating industries.

As a nation, we have other choices as well that would help promote the growth of these kinds of industries. There seems to be growing interest in investing in new national initiatives that could fulfill public needs and at the same time improve our industrial competitiveness and raise living standards for all Americans. Some examples: a program of environmental protection and cleanup that would also foster a competitive U.S. environment industry; rededication to top quality education and training for managers, engineers, and workers; construction of first-class transportation and communication systems.

Desirable as they may be, it is not likely that any of these growth programs would eliminate all of the pain of the transition we face. All of them take time to gear up. Some could very likely use the talents of people now in defense industries, but the match would not be perfect. There is no silver bullet. A constructive combination would be to offer adequately funded, high quality adjustment programs to ease the difficulties workers and communities face now, and to craft public investment programs that could advance technology, raise our nation's productivity, and lead to competitive success over the long haul.

SENATOR SARBANES. Thank you very much.

First of all, I have a couple of questions about your statement.

When is the report on opportunities to redirect technological and human resources into building a stronger commercial economy going to be available?

MS. GILLMAN. We expect to deliver that to the Congress early next year.

SENATOR SARBANES. Early next year?

MS. GILLMAN. Around February of next year. We are working on it right now.

SENATOR SARBANES. Is there any way to get an earlier knowledge of where it is going, or more of a handle on that part of the puzzle sooner?

MS. GILLMAN. We'd be happy to confer with the members and staffs of Congress and let you know how our investigations are going.

Right now, we are visiting national labs. We are talking to private companies that are trying to get into new forms of transportation. We are looking at the California initiative for new forms of transportation.

Those are the kinds of things that we're already investigating.

SENATOR SARBANES. What will this report be examining? I have what may be a simplistic view of this. But suppose the FAA or the Federal Government were to announce that the United States was going to embark on a significant upgrade in its air traffic control systems at the Nation's airports, and that the government, which is in the contracting business for these air traffic control systems, is going to start giving out a lot more contracts. This is something that is clearly needed. You have the airports standing in line to do that, and it is obviously impeding our ability to have a highly efficient air transportation network. .

The premise of that is that many of the people doing defense work could produce an effective air traffic control system, which in many instances would be highly relevant and very much a direct transfer over.

So what the government would do, as it is cutting back on defense procurement contracts, is it would enter into a conscious strategy of increasing civilian procurement contracts, particularly in those activities where you could see a close linkage.

Another possibility where the linkage is perhaps not as close would be to figure out some way that we could start producing subway cars in this country, for example. We import them all, from France, Germany, Italy and Japan, our prime competitors in the international economy.

People who used to make tanks could use their expertise to make subway cars. But there has to be a market. Someone must put out a contract for subway cars if people are going to produce subway cars.

Is that what this report will be looking at?

MS. GILLMAN. It is.

SENATOR SARBANES. Are those two examples too simplistic?

MS. GILLMAN. I think those are good examples. Mr. Chairman. You probably know more about the FAA system than I do. But I do know

that the FAA is already involved in a multi-billion-dollar upgrade of the air traffic control and weather information systems. And in fact, there are defense companies that are taking the lead in that they — Martin Marietta, Westinghouse Electronics, Lockheed Electronics — are all involved in using the technologies that they developed for their military Communications, Command, Control, and Intelligence systems.

They're using that same kind of technology to develop an upgraded air traffic control and weather information system for airports. Perhaps more can be done in that area. We have not yet looked into it fully.

As far as light rail systems, there probably is some room for that. And the Surface Transportation Act, as you know, does give some incentive and support for those systems.

At the moment, it is a rather slowly growing market in the United States. We think — and I am telling you this on the basis of about two days' investigation — there may be more long-term payoff in personal transportation, in things like electric vehicles, possibly, than in mass transit, although there are possibilities in mass transit.

Again, some of the companies that have been in communications' intelligence systems, an electronics for military purposes may be able to provide the sophisticated electronic controls for light rail systems. Probably there is quite a large area for defense technologies to be transferred into nondefense applications that are beneficial to the whole economy.

SENATOR SARBANES. We have been working closely with Westinghouse, which of course is a big employer in my state, and they have developed traffic control systems for the bus and subway systems that are now being used in the Baltimore area. It is also being used in Milwaukee, and they are looking elsewhere in the country in order to make systems available. That is almost a direct transfer over from military to civilian technology.

It seems to me that we are going to have to think in terms of larger magnitudes. We are talking about large amounts of money in the defense industry. When we think in the civilian sector, we tend not to think in those terms. But if you are going to shift over this demand, you have to find something that's comparable.

The FAA does have a multi-billion-dollar program, but I am suggesting it ought to be increased very significantly beyond that. The need is there for it. It is not as though it is make-believe, that you are creating air traffic control systems where you do not need them. All the major airports are lacking.

Let me ask this question.

You indicated that only a few states — I think was your phrase — have done a very good job under the EDWAA program.

Is that correct?

Ms. GILLMAN. An SRI report for the U.S. Department of Labor gave good marks for rapid response to about a half dozen states.

SENATOR SARBANES. Could you indicate which states we should look to as an example?

Ms. GILLMAN. I can give you an example of two states that we personally looked at that we think are doing a very, very good job of rapid response. One is Massachusetts. Another is Colorado.

SENATOR SARBANES. What is it that they are doing that seems to make the difference?

Ms. GILLMAN. They have good people in charge, people who are experienced and dedicated and make every effort. When they get the first hint that there's going to be a massive layoff or plant closing, they are in there immediately, and not just with someone who comes in and says, well, you can go over there for your unemployment insurance and over here for vocational education.

They make sure that a whole range of services is in place before the layoff takes place, if possible. And the Warn Law, when it's properly implemented, has been very helpful in that respect. Many of the EDWAA state directors have told us that the Warn Law helps them a lot in getting advance notice and services in place before the workers are laid off. Rapid response is extremely helpful in two ways. First, the workers are still there. You can get in touch with them. And second, it helps to avoid a lot of problems. People can get financial counseling, and advice and counseling about education and training opportunities. In some places, people get new jobs even before they are laid off if they have the advance notice and if they have a good program in place that provides a range of services — from counseling to job development to assessment and testing for possible training opportunities.

SENATOR SARBANES. Let me ask you this question. These programs are all designed on the premise that you, in a sense, intrude or mix into the existing civilian economy the people that are both in the defense industry and coming out of the military for whom you have to find jobs.

In other words, you have the existing pattern and you, in effect, integrate into it.

You have your existing range of activities and you simply try to absorb people into those existing ranges.

Is there an opportunity here and is there a way to do it in a way that says, we have a lot of talent here; we have unmet needs. Is there some way to structure this so that you, in effect, add new dimensions? You help to accomplish the transition and have a new dimension in how you function after the fact.

Let me give you an example.

Ms. GILLMAN. Okay.

SENATOR SARBANES. You have all these drill instructors and other teachers and molders of men and women in the armed services, and they seem to do a pretty good job in that environment.

Of course, they have certain advantages that do not exist in the civilian sector; namely, a discipline and control over their people. But

nevertheless, they have been very successful at taking young people having a lot of trouble out in the private sector and shaping them up, as it were.

Now, is there an opportunity there? Do you have some talents that have been developed that you ought to be considering? Is there some program where we can take these teachers, these trainers, and somehow move them into the civilian sector — not integrate them into the existing civilian sector, so one goes off and becomes a policeman and another goes off and becomes a fireman, another becomes a security guard, but some kind of program that takes this talent and says, we have this unmet need out here in the civilian sector, so how do we take some of these young people and break some of these social patterns and get them to where they are responsible members of the society?

That is just one issue.

Ms. GILLMAN. You are talking about creating a new kind of teaching or learning institution. I am going to ask Rob to reply to that if he has some ideas on it. That's not something we have looked at very closely. But I would say one thing, the people in our all-volunteer armed forces are not usually people who have been in trouble. They are very high-quality young men and women. In fact, they are in some ways better educated than their age cohorts in the civilian side of the economy. So I am not sure that it would be quite right to say that military trainers have molded people who are in trouble into constructive young people. I think they probably were constructive young people when they came into the armed services, but they have gotten good training there.

Now, as far as a new kind of institution that could use the abilities of people in the armed services, Rob, do you have anything to say on that? I know you looked into that as a possibility in Maryland.

SENATOR SARBANES. Let me give you another example. Some have suggested that we ought to have a special program to take engineers and other scientists who are being made redundant in defense industries and figure out a way to move them into the teaching of science and math in the high schools as a second career. We have a shortage of quality science and math teachers in our secondary schools. We have a pool of talent here that obviously knows the subject matter, and some of them I think would make very good teachers.

Instead of somehow trying to integrate them into the existing arrangement, should we have a special program that utilizes these talents in a very directed way?

Ms. GILLMAN. That is a good idea and it is in existence in some states. Some states have gotten past the bureaucratic hurdle of saying that you have to be certified with a rigidly specified kind of teacher training, and have set up alternative training programs for retired army personnel and engineers. Usually it is retired people, because the salaries are a good deal lower than what they are used to. But the retirement pay plus the teacher's salary can be very attractive.

There are effective programs in New Jersey, Texas and other states that make use of retired defense people, either from the armed forces or from private industry.

Did you want to say something more about that, Rob?

MR. ATKINSON. I just want to say that I think the potential for those efforts is probably smaller than we would think, or possibly even like.

For example, in thinking about DoD military personnel becoming teachers, about 70 percent of the people who will be leaving the military are enlisted personnel, many of them without bachelor's degrees. Although they are a high-skilled, a highly educated group, many of them have do not have bachelor's degrees, and therefore couldn't teach.

For the officers, many of them are making salaries that are much higher than what teaching salaries would be, and the same would hold true for engineers.

So many engineers who are going into teaching are often retired engineers who are able to have a pension and then accept the lower salaries that teaching would bring.

One area that may be possible, and again we didn't look into it all that closely, is social services, where you do not need a BA and the requirements are not necessarily as high. There are inner-city needs for social problems and that may be one area where military personnel could serve a function.

But, again, the problem there is funding. Unless there is funding to create those positions, there's no way that they could do that.

SENATOR SARBANES. All right. Senator Bingaman?

SENATOR BINGAMAN. I would like to ask about a couple of questions.

First of all, Ms. Gillman, in your comments, you indicated that 2½ million jobs could be lost as part of this builddown over the rest of the decade, or through the year 2001, I think you said.

In addition, you said that we would already lost 2½ million jobs in the last 12 years in manufacturing. Do you have any sense of how many of those additional 2½ million, which could be lost because of the defense builddown, would be in manufacturing?

MS. GILLMAN. I think it's 60 percent of the private industry employment, and the estimated decline in private industry defense employment over the 10 years is nearly 1½ million.

So it would be close to a million in manufacturing.

SENATOR BINGAMAN. Okay.

MS. GILLMAN. I would have to look at the tables to be sure.

MR. ATKINSON. About 800,000.

MS. GILLMAN. Something in that neighborhood.

SENATOR BINGAMAN. Do you know, separate from this report, if there are predictions or projections of what's going to happen in the manufacturing sector over the rest of this decade?

We had a hearing in this same committee with the Bureau of Labor Statistics people last week, and they said that their projections were that the trend of losing manufacturing jobs was going to continue.

Ms. GILLMAN. Based on previous work that OTA has done, not on this particular report, but on previous studies of dislocated workers, we expected that trend to continue for two reasons.

First, there are many competent manufacturing companies all over the world now. There's a lot of tough international competition. Second, in order for us to compete in the way that we do best, which is through advancing technology and raising productivity, we will require fewer workers for the same amount of output. If we're going to be successful up against world competition, we have to do it by raising productivity.

Now, the way you can raise productivity and also add workers is to have a rapidly expanding market. That could happen with a brand new product. But we expect overall that our way of competing will have to be to become more productive. So it looks to us, considering that many other countries have good manufacturers, that it's not just us who are the leaders any more, and considering that we expect our productivity to advance to become better competitors, we are not going to see an increase in manufacturing jobs.

SENATOR BINGAMAN. What we have done — I know you are aware of it because you refer to it in your report — we did a couple of things in the defense bill last year that were not as ambitious as the Chairman was referring to, where we would identify other needs or other types of projects — procurement activities — which the government could engage in that were nondefense.

But instead, what we said was, let's try to identify areas that the private sector is trying to do, or states or localities are trying to do, and get the Federal Government in the business of helping them.

That was the approach we took. It was not to go out and really macromanage everything, but say, okay, what have people identified as useful ways to use resources and expend energy at this stage and what can we do to help?

A couple of the areas that we came up with were manufacturing extension, the federal program of using some defense dollars to support the manufacturing extension programs that states and localities already have in place, which you referred to, and the other was this thing that we called CTACs, or Critical Tech Application Centers, which was an effort to build on what Michael Porter has talked and written about extensively. And that is, industry clusters that are focused on particular competencies, where industry has gotten together and said, okay, since a bunch of us are in the same kind of business, let's get together and work on technology application in a particular way, or technology development. And there, we propose that the Federal Government could, through the defense bill, or through the defense budget, come up with

... I think we limited it to 30 percent of the total funds spent in those efforts.

On manufacturing extension, one of the arguments that we ran into at all stages was that this is not an appropriate area for the Defense Department. If it ought to be done, it ought to be done by Commerce or by somebody else, and not the Defense Department.

I guess what I am hearing this morning is that you think that part of a rational or well-thought-out defense conversion program could be an increased level of federal support for these kinds of extension activities.

Mr. Atkinson, maybe you'd want to comment, or either one of you, if you do think that the nature of the challenge we face today makes this an appropriate area for the Defense Department to engage in.

MR. ATKINSON. I do, Senator. One of the efforts already that Congress has made, as you know, is the $200 million in the 1991 defense bill, $50 million of that was to EDA and $150 million to labor.

So there's a precedent for DoD to spend money, to have DoD money spent for responding to the builddown.

While those efforts are good, in a lot of ways, they are after-the-fact efforts. They are waiting for dislocation to happen. I think an effort like a manufacturing extension program, or a CTAC program, would have the advantage of being proactive and could help firms that are partially defense and partially commercial. It could help them develop new markets, new technologies and new capacities so that they do not have to lay people off and then have to go into using community development grants or Department of Labor grants.

So I think there is a precedent for that.

SENATOR BINGAMAN. Okay. Ms. Gillman?

MS. GILLMAN. I would like to add that those are exactly the kinds of programs that we think can both improve our competitiveness generally and ease the transition from defense to commercial production. The very same kinds of programs can help companies get into more commercial production and help companies to do it better.

It seems to us that it is a part of the responsibility of the Department of Defense to help with this defense conversion, whether in the way Rob suggests, by contributing DoD money to existing state and local programs, or to the existing federal program. There's a federal program, as you know, in the Department of Commerce under NIST for manufacturing technology centers.

Both of those could be helped with an infusion of DoD money. And the CTAC program is a very interesting idea. We do not yet have anything quite like that in this country, but several foreign countries have a lot of experience with that kind of thing — Japan, in particular, with its Research and Testing Institutes, which are in a nationwide network that receive over half a billion dollars from the national and prefectural governments.

This is the kind of thing that could raise the performance of our manufacturing firms generally and could also assist in the conversion from defense to commercial.

SENATOR BINGAMAN. To bring the question down to a specific part of the defense industry — aerospace is one — I know Don Fuqua is going to be testifying on the next panel, and I will ask him the same question.

But my impression is that the aerospace industry is made up of Boeing, McDonnell-Douglas and a few large firms. But you have a great many small- and medium-sized suppliers and contractors that work for that industry. They work either for the defense side or for the commercial side, and most of them probably do a little of both.

There's more dual-use kind of work at the subcontractor level than perhaps there is even at the prime level, in the sense that it's easier to do some of the work for both defense and nondefense.

We have had a couple of hearings in this Committee on the aerospace industry, and what the future of it is, and what's going to happen with McDonnell-Douglas's proposed sale if that goes through and what's happening generally with the defense builddown and the impact that that will have.

I've been real concerned that we're going to lose, and maybe we already have. I guess that would be the question to you, to what extent is the impact we're seeing on the subcontractors and suppliers to the aerospace industry as a result of this defense builddown, or how much do we expect?

Is this a group that clearly could benefit from the kinds of things we're talking about?

MS. GILLMAN. I do not think we know for sure. You'd probably need community-based surveys to understand in much detail what is happening to the supplier base. But it stands to reason that these firms are being hurt first because of loss of defense business, and second because we have had a recessionary or stagnant economy.

State surveys of smaller defense firms, both prime and subcontractors, show that most of them are dual-use. They want to get into more commercial production. They want help with marketing. They want help with new product development. And they want help with selecting the right equipment, using it properly, training their workers, and organizing their work well.

Most of them know that they want to get into commercial markets and that they want to compete more successfully. But the ones that we visited are concerned about finding markets, both because of the defense builddown and because of the recession. They say, where are we going to sell these things? Did you have something to add to that, Rob, from the ones you interviewed in Massachusetts?

MR. ATKINSON. The ones that we interviewed, I think there is a potential. Again, there's virtually no data on the subcontracting defense tier. Any data that has been collected has been collected at the state level

and from surveys. But the ones that we have talked with, many of them seem at risk of going out of business because they are already at 50 or 100 people and dependent upon a few contracts, or they are going to shrink as their defense contracts go away, and they are dependent upon commercial contract.

Again, many of them are in a position where they could significantly upgrade their technology capacities, but aren't taking advantage of it.

SENATOR BINGAMAN. Let me ask about one other subject, if I could, and that is manufacturing engineering education. That's another area where last year we tried to begin doing something in the defense budget. We authorized and appropriated, I think, $30 million to be used as grants to universities to upgrade their manufacturing engineering programs. We also talked about establishment of a manufacture-in-the-classroom kind of a program where you'd essentially fund people to come in and work in junior colleges and in two-year institutions to teach manufacturing where that capability wasn't there before, perhaps.

Is there something that Congress should look at in the area of manufacturing engineering education, or something in that area which is also a complement to these other kinds of programs?

Is there a real need for more instruction there to provide the skills that people need to upgrade manufacturing?

MS. GILLMAN. We believe that there definitely is a need, on both the university and community-college level.

One thing that Congress might want to consider, in addition to what you've already done, is establishing a manufacturing engineering or manufacturing sciences directorate in the National Sciences Foundation.

What that would do is to raise the level of attention to manufacturing engineering. Perhaps it would make available more money for research in manufacturing science and engineering.

We have reached a point in manufacturing engineering where we can take a more scientific approach than we have in the past. There's a lot of room for more research through computer capabilities into manufacturing engineering problems.

I think a Manufacturing Sciences Directorate could bring more attention to these problems. You'd have more possibilities of training people, of grants to graduate students, and of grants for research in that area.

SENATOR BINGAMAN. Thank you very much, Mr. Chairman.

SENATOR SARBANES. I have one final question.

I was struck by the observation that, I think, you said, over a billion dollars' worth of concessions have been given to Japanese automakers to locate in one place or another in this country.

Is that correct?

MR. ATKINSON. Actually, it's less than a billion. The figures could range anywhere from $700 million to $900 million.

SENATOR SARBANES. If one accepts the premise that the automakers wanted to locate in the United States in any event, that really was a subsidy handed out because of the competition amongst ourselves, which did not have to be made from a national point of view.

Is that not correct?

MR. ATKINSON. That's absolutely right. Those Japanese firms were going to locate in the United States. The subsidies only dictated what state they located in.

SENATOR SARBANES. What can be done to prevent that sort of thing?

From the state point of view, it is to their advantage to do that, or they think it is. From a national point of view, it is not to our advantage, is it?

Is there any advantage gained at the national level by doing that?

MR. ATKINSON. No. In fact, with giving subsidies to domestic firms, it's probably a net wash. Giving subsidies to foreign firms, it's a net loss to the country because we're subsidizing our foreign competitors.

Unfortunately, states are caught in a game where if the individual state doesn't play the game, it risks losing out. And so there's a bidding war, almost like an arms race, people have called it.

I think that it's a very difficult subject to get a handle on in terms of the solution. One possible solution would be to tie federal economic development aid inversely to the amount of incentives that states provide.

If states wanted to choose to provide large incentives, they would be welcomed to do that, but they would receive less federal economic and community development aid.

That's one possible approach.

Another possible approach would be for the Department of Commerce to convene some kind of meeting with the state commerce directors or the governors and try to get a handle on this through some kind of persuasion or cooperative agreement.

SENATOR SARBANES. Do other countries do the same thing in reverse?

MR. ATKINSON. No, other countries do not usually do the same thing. In Japan, for example, MITI takes a very strong hand on this and basically prevents the prefectures from giving grants to foreign firms to come in and locate in the individual prefecture.

There, it's a different governmental system, though, and they are able to do that because they have more persuasive powers over the local governments than we do in this country.

But, generally, other countries try to take measures not to prevent that.

MS. GILLMAN. There is one other country in which it's been done quite a bit, and that's the United Kingdom. And there's just as much controversy there as there has been here about it.

It's been done both at the national and local levels in the United Kingdom. The European community is trying to control that to some

extent. And right in the United Kingdom itself, there's a lot of controversy about it.

SENATOR SARBANES. Thank you very much. You have been a very helpful panel, and this is a very good report. We look forward to the next one. And we also look forward to getting an advanced sense of the next one.

MS. GILLMAN. We'd be happy to confer with you any time, Mr. Chairman.

SENATOR SARBANES. Thank you very much. We appreciate your testimony.

We will now go to the second panel, which consists of: Ethan Kapstein from the Olin Institute for Strategic Studies at Harvard; Brian Bosworth, the Manufacturing Resource Center of Tufts; Don Fuqua, Aerospace Industries Association of America; and Daniel Flaming, president of the Economic Roundtable in Los Angeles.

Gentlemen, I think what we will do is to start with Mr. Kapstein and then move straight across the panel. We have your full statements and we'll include them in their entirety in the record. If you could each summarize the main points, we would appreciate it. We will hold our questions until we have heard from all four members of the panel, and then we will have a general discussion and question period.

Mr. Kapstein, we would be happy to hear from you.

STATEMENT OF ETHAN B. KAPSTEIN, CO-DIRECTOR, ECONOMICS AND NATIONAL SECURITY PROGRAM, OLIN INSTITUTE FOR STRATEGIC STUDIES, HARVARD UNIVERSITY

MR. KAPSTEIN. Thank you, Mr. Chairman.

Mr. Chairman and members of the Committee, I am honored to have this opportunity to be with you today. What I would like to do is to share with you some of my findings concerning the economic problems associated with defense downsizing.

The present era, of course, is not the only time that we have confronted this challenge. Since World War II, we have faced four such periods, from 1945 to 1948, from 1953 to 1955, from 1972 to 1976, and the present period beginning in 1985.

Each era of downsizing has brought with it some wrenching changes for individuals, firms and communities, but we also have a body of historical experience upon which we can draw some valuable lessons.

Furthermore, the United States is not the only country to have had this experience. In Western Europe and Russia, the challenges of reducing military expenditures and converting defense facilities to other types of production have also been confronted. Later in my presentation, I would like to share with you some of those experiences, for America can learn, I think, from other countries as well.

Perhaps the most important message that I can get across today is that in order to make a successful economic transition to lower levels of defense spending, a mix of macro and microeconomic policies is required.

Indeed, I would argue that the best way to think about economic conversion is as a macroeconomic phenomenon. That is, what we should worry most about is the reallocation of the factors of production, capital and labor, to their most productive alternative uses, rather than focusing on changing guns into butter at the plant level.

Although you'll collect many anecdotes in these hearings and in your research about successful plant-level conversion, the data and historical experience show that relatively few defense firms have been able to renew themselves as successful commercial enterprises.

In short, defense conversion works when the economy is growing and generating new jobs.

Let me give a little history, if I may.

In 1943, President Roosevelt put Jimmy Burns in charge of defense conversion efforts. The planning did begin that early. What Burns did was to assemble teams of engineers — people from MIT and other schools — to go across the country surveying every defense plant and producing very detailed studies about those plants and their opportunities for postwar conversion.

By 1947, these studies were in the dustbin and the conversion effort was deemed to be a failure.

In fact, what happened after World War II is that the majority of defense plants were simply shut down and their machine tools were literally dumped into the ocean.

Maybe some of you have seen the Coppolla film, "Tucker," in which an entrepreneur tries to convert an aircraft plant into an automobile factory. The Tucker Company failed, as did most similar ventures. And indeed, efforts even to keep producing aircraft in those factories failed, because by 1947 the aircraft industry was just a small fraction of its wartime size.

So what happened?

Well, after World War II, and especially after 1947, the economy began growing. The release of price controls, the adoption of the GI Bill, and the Employment Act of 1947, ignited the postwar boom. So returning veterans found jobs, but I think it must be remembered that they often displaced wartime workers — mostly women and minorities — in the process.

The point is that conversion didn't work at the plant level. It worked as a macroeconomic phenomenon. And indeed, the only plants to convert were those which had been in the commercial sector before the war ever started.

Similar stories can be told for the post-Korea and post-Vietnam periods, with a twist, because after those downsizings, many defense firms

tried to enter commercial enterprises through diversification and acquisition strategies. That is, rather than convert defense plants, they tried to buy commercial firms.

And again, the record is not good. The data show that the vast majority of these acquired firms were divested by the defense company within five years. Because of very different corporate cultures, defense firms in general have difficulties coping in the competitive mass production market place. And once more, what got the economy out of trouble was growth rather than plant-level conversion.

I think the experience of other countries supports this analysis of the interplay between macro and microeconomic factors. Take the case of France. After the Algerian War, the French were faced with the prospect of converting almost all their naval shipyards, and they did all these technical studies as well.

The engineers found that the shipyards in Brittany could be converted more easily than the shipyards in the Mediterranean for various technical reasons.

But what happened? Lo and behold, the shipyards in the Mediterranean were converted. Why? Because the Mediterranean region was booming, so these shipyards could convert into marinas, or supporting marinas, and tourist activities or workers could find new jobs in tourist-based industries.

The economy in Brittany slumped and conversion failed and unemployment rose in that region. So again, I think it shows how macro factors affect what happens at the micro-level.

The Russian case also points to the importance of the macroeconomy. As you well know, when he came to power in 1985, Mikhail Gorbachev began work on conversion and all sorts of commissions and studies were made. In some cases, plants were ordered to shift into commercial production.

Today, conversion is considered a top priority of the Russian government, and a group of us from Harvard recently returned from Moscow where we have been working with Russian colleagues on this issue.

I think the problem of conversion in the former Soviet Union powerfully illustrates this proposition that macroeconomic performance is the key to offsetting defense downsizing.

The failures of defense conversion in the Soviet Union and former Soviet Union have sparked a debate in Moscow about the merits of military Keynesianism, that you just maintain military spending to keep workers working and the economy growing.

And given the lack of economic growth in Russia, workers just can't find alternative jobs. Further, there's no housing, even if they did want to move to a different city and take on a new job.

The outcome is that the directorate responsible for this problem is called the Bureau of Conversion and Arms Transfers. If one policy doesn't work, maybe you try the other. I think there is concern in

Russia, Czechoslovakia and other countries that if they do not adjust to the defense downsizing, there will be pressures to increase arms sales and for defense scientists to work for the highest bidder, whoever that may be.

Now, what does all this mean for the United States?

I think the message is clear. If you want to help American defense workers, the best thing you can do is help this country get its macroeconomic house in order.

For the past three years, the United States has generated painfully few jobs. We feel it very sharply in Massachusetts. Yet, during this time, thousands of military personnel and defense workers have been let go and thousands more will enter the work place as defense cuts proceed.

I think few of these workers will find similar alternative employment. What they need is a growing economy that generates new jobs.

Beyond that, however, there are policies that the government can adopt at the microeconomic level. I do not believe that defense workers and firms should be simply left to the magic of the market place. After all, these economic agents have worked in a nonmarket economy all their life, where the government has been the sole buyer of their output.

I do think that the government does have responsibility to these people and the firms.

Specifically, the government, I think, should focus its efforts on worker retraining and relocation, as it has done to some extent. And I think programs aimed at retraining and relocation really are the best micropolicies that can be adopted.

I think we should give full support to the Defense Department's Office of Economic Adjustment, which, for the most part, does an admirable job in working with communities that face shutdowns.

We might consider expanding the brief of the Small Business Administration to help would-be entrepreneurs from the defense industrial community. Perhaps, the SBA could be helpful in linking scientists and engineers with venture capitalists, for example.

Further, I think the Defense Department should make it easier for defense firms to commercialize technologies that are spun off as a result of military research and development. It has often been said that secrecy laws impede commercialization.

I think some of the most successful conversion cases occur when defense firms are able to find commercial outlets for the technology. I am thinking of Rockwell International, which used its imaging technology in its printing plant subsidiary, as an example.

Finally, I think the Congress has to grapple with tax policy in order to ensure that we encourage savings and promote investment.

To conclude, Mr. Chairman, this country is in the process of dramatically reducing its defense burden. Over the long run, this will be beneficial to our economy as resources are released to more productive

uses. But for the next several years, many firms and thousands of workers will feel considerable pain.

We should do all we can to ease their transition without giving false hopes that jobs and plants can be maintained and converted. The best thing we can do is to give these workers a second chance in a growing American economy.

Thank you.

[The prepared statement of Mr. Kapstein, together with attachments, follows:]

PREPARED STATEMENT OF ETHAN B. KAPSTEIN

Mr. Chairman and Members of the Committee, I am pleased to have this opportunity to be with you today. As co-director of the Economics and National Security Program at Harvard, as author of a recent book on defense economics (The Political Economy of National Security: A Global Perspective), and as editor of a forthcoming book on defense conversion, I have spent a good deal of time conducting research on the economic problems associated with defense downsizing. Today, I would like to share with you some of my findings.

The present era, of course, is not the first time that the United States has confronted the challenges of reducing its defense spending while maintaining economic growth. Since World War II, we have faced four such periods, viz., from 1945-1948, from 1953-1955, from 1972-1976, and the present period that began in 1985. Each era of downsizing brought with it some wrenching changes for

individuals, firms, and communities, but it has also created a body of historical experience from which we can learn some valuable lessons.

Furthermore, the United States is not the only country to have had this experience. In western Europe and Russia, the challenges of reducing military expenditures and converting defense facilities to other types of production have also been confronted. Later in my presentation I would like to share some of this comparative perspective with you, for America can learn from the experiences of other countries as well.

Perhaps the most important message that I can get across today is that in order to make a successful economic transition to lower levels of defense spending, a mix of macro- and micro-economic policies is required. Indeed, I would argue that the best way to think about conversion is as a macroeconomic phenomenon. That is, what we should worry most about is the reallocation of the factors of production (capital and labor) to their most productive alternative uses, rather than focusing on changing guns into butter at the plant level. Although you will collect many anecdotes in your research and hearing about successful plant level conversion, the recent data and the historical record show that very few defense firms are able to renew themselves as commercial enterprises. In short, defense conversion is most likely to succeed when the economy is growing and generating new jobs.

Let me begin with a little history. In 1943, President Roosevelt put Jimmy Byrnes in charge of the postwar conversion

effort; yes, the planning began that early. Byrnes assembled teams of engineers to go across the country, conducting detailed industrial studies of every major defense plant and providing recommendations for postwar conversion. By 1947, most of these studies were in the dustbin and the government-led effort to convert plants was deemed a failure.

In fact, what happened after World War II is that the vast majority of plants built for defense purposes were simply shut down, their machine tools literally dumped into the ocean. Maybe some of you have seen the movie Tucker, which illustrates one entrepreneur's attempt to make use of a wartime surplus aircraft factory and its machinery. The Tucker Automobile Company, like most similar ventures, failed. Indeed, efforts to keep producing aircraft in these factories were hardly more successful. By 1947, the aircraft industry had shrunk to a small fraction fraction of its wartime size.

So what happened? What happened is that after World War II, and especially after 1947, the economy began growing. The release of price controls, coupled with such legislation as the GI Bill and Employment Act of 1947, ignited the postwar boom. Returning veterans found jobs, but it should be remembered that they often displaced wartime workers in the process. The point is that economic growth rather than plant-level conversion characterized the postwar period of defense downsizing.

Similar stories can be told for the post-Korea and post-Vietnam periods, but with a twist. During these periods of

reduction, many defense firms tried to enter commercial businesses through diversification and acquisition strategies. That is, rather than convert defense plants, they simply tried to buy existing companies. Again, the record is not good. The data show that the vast majority of these acquired firms were divested by the defense company within five years of purchase! Because of very different corporate cultures, defense firms in general have difficulties coping in the competitive, mass production marketplace. Once more, what got the economy out of trouble after each wartime period was renewed economic growth rather than plant-level conversion.

The experience of other countries also supports this analysis of the interplay between macro- and micro-economic factors. Take the case of France, which after the Algerian war was faced with the prospect of converting many of its naval shipyards to alternative uses. From a technical perspective, the yards in Britanny were easier to convert than the yards in the Mediterranean, but by the mid-1960s the French had found that conversion had been most successful in the latter case. Why? Because the economy of the Mediterranean was growing at the time, and shipyards were either able to convert to marinas or repair facilities, or the workers were able to find alternative employment in tourist-related industries. In Britanny, in contrast, the regional economy was slumping, and conversion failed. This example again shows how macro-factors can create opportunities for defense-related industries which micro-level planning cannot achieve.

The Russian case also points to the importance of the macroeconomy. Upon coming to power in 1985, Mikhail Gorbachev spoke about the need to convert defense industries to civilian production. Commissions were created and studies were made. In several cases, plants were ordered to produce goods for the civilian sector. Today, conversion is considered a top priority for the Russian government, and indeed a group of us from Harvard have recently returned from Moscow where we have been studying this issue with Russian colleagues.

The problem of conversion in the former Soviet Union provides powerful support for the proposition that macroeconomic performance is the key to offsetting defense downsizing. The failures of plant-level conversion have caused a debate to emerge in Moscow about the merits of military Keynesianism--keeping up military spending to bolster the economy and maintain jobs. Given the lack of economic growth in Russia, defense workers find it difficult to seek new jobs; and of course, given the lack of housing it is hard to move in any case. The outcome is that the directorate responsible for working this problem is called the Bureau for Conversion and Arms Transfers! Indeed, in Russia, Czechoslovakia, and other countries there is justifiable concern that the failure to adjust to lower levels of defense spending will result in pressures to increase arms sales and for defense scientists to work for the highest bidder, wherever he may be.

What's all this mean for the United States? The message is clear: if you want to help American defense workers, the best thing

you can do is help this country get its macroeconomic house in order. For the past three years, the United States has generated painfully few new jobs. Yet during this time thousands of military personnel and defense workers have been let go, and thousands of more will enter the workplace as defense cuts proceed. Few of these workers will find similar, alternative employment. What they need is a growing economy that generates new jobs.

Beyond that, however, there are policies that government can adopt at the microeconomic level. I do not believe that defense workers and firms should be left to the "magic of the marketplace." These economic agents have functioned in a non-market economy in which the government has been the sole buyer of their output. The government, I believe, has a responsibility to such agents.

Specifically, the government should obviously help in worker retraining and relocation, as it has already been doing to some extent. Indeed, programs aimed at retraining defense workers and military personnel are probably the best micro-policies that can be adopted. I believe the government should provide full support to the Defense Department's Office of Economic Adjustment, which for the most part has done an admirable job in working with communities that face the shutdown of military facilities. It should consider expanding the brief of the Small Business Administration to help would-be entrerpeneurs from the defense industrial community. The SBA, for example, could be of assistance in linking scientists and engineers from defense firms with venture capitalists. Further, the Defense Department should try to make it

easier for defense firms to commercialize technologies that are spun-off as a result of military research and development; it has been said that secrecy laws impede defense firms from taking commercial advantage of technologies which could enter the marketplace without security consequences. Finally, I believe the Congress must once again grapple with tax policy in order to ensure that we encourage savings and promote investment, rather than encourage consumption and depletion of savings.

Mr. Chairman, the country is in the process of dramatically reducing its defense burden. Over the long-run, this will be beneficial to our economy, as resources are released to more productive uses. But for the next several years, many firms and thousands of defense-related workers will feel considerable pain. We should do all we can to ease their transition, without giving false hopes that jobs and plants can be maintained and converted. The best thing we can do is to give these workers a second chance in a growing American economy.

ETHAN B. KAPSTEIN

From Guns to Butter in the USSR

Mikhail Gorbachev's effort to convert portions of his defense apparatus to civilian production will take time and money. As international disarmament proceeds, the West would do well to watch and learn from the Soviet experience.

Mikhail Gorbachev, at the United Nations last December, pledged to cut Soviet defense spending by 14.2 percent by 1991, and to reduce military procurement. Moreover, Gorbachev's "desire to reduce the burden of defense is unequivocal, and there is support from other leaders to reduce the absolute level of defense outlays," according to the U.S. Defense Intelligence Agency (DIA).

This initiative reflects a widespread perception among Gorbachev's civilian (not military) advisers that excessive defense spending over the past decade has claimed a disproportionate share of scarce resources, which in turn has created some of the fundamental problems now facing the Soviet economy.

The DIA estimates (see Table 1) that defense has accounted for about one-sixth of Soviet gross national product in 1970-1985. On the microeconomic level, the "new thinkers" who surround Gorbachev accuse the defense sector of draining trained manpower, capital, and research and development efforts away from civilian pursuits. These analysts view it as impossible for the Soviet Union to win an arms race with the West.

On the strategic side, the "new thinking" about defense has been reflected in the doctrine of "reasonable sufficiency," which basically argues that the Soviets should maintain only the minimum level of forces necessary to fulfill military missions. On the economic side, it has been reflected in the notion of "reconversion."

Table 1 **Soviet Defense Spending, 1970–1985**
(billion 1982 rubles)

	1970	1975	1980	1985
(1) GNP	481.4	561.3	624.0	684.7
(2) Defense Spending	80.0	95.0	105.0	110.0
(3) As percent of GNP	16.6	16.9	16.8	16.0

Source: U.S. Defense Intelligence Agency.

As part of the economic restructuring process, Gorbachev has stated his objective to convert a portion of defense enterprise to civilian production. While the Soviet president's goals for conversion appear appropriately modest in the near-term, he and his advisers

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have expressed the hope that by freeing capital and human resources from the defense sector, both the quantity and quality of civilian production will increase. The renewal of economic growth and technological innovation, Gorbachev recognizes, is critical, not only if internal reforms are to proceed—and succeed—but also if the Soviet Union is to maintain its superpower status on the world stage.

The Soviets have targeted the conversion process at specific economic sectors. Writing in his 1987 book *Perestroika*, Gorbachev said that "Structural modernization of Soviet machine-building must be combined with vast efforts to turn the scientific potential to good account." Elsewhere he has written that the emphasis of reconversion efforts must be placed on "machine tool-building, instrument-making, electronics and electrical engineering."

These sectors, of course, have not been chosen at random. In the Soviet Union, the military industries are already responsible for a significant percentage of civilian output. The industries listed above, which are controlled by the military, are particularly important from the civilian point of view.

Furthermore, it is in these industries where the opportunities for "spill-over" appear greatest. On the one hand, processes learned in military applications may be transferred to civilian production; on the other, as "dual-use" technology emerges as a growing phenomenon throughout the world, it may be that civilian innovations will ultimately have important military applications.

Nonetheless, neither the existence of a mixed military/civilian production base nor of a dual-use technology base should be exaggerated. In most cases, military and civilian production remains quite separate in the Soviet Union, as elsewhere. And despite the increasing use of shared components between military and civilian hardware, especially in electronics and precision optics, the two outputs remain far different. This suggests that industrial plants that produce intermediate goods for final production may be better targets for conversion than those that are engaged in the final assembly of such weapons systems as tanks, airplanes, or naval vessels.

Examining economic conversion

Will Gorbachev succeed in his efforts to convert Soviet military production to civilian purposes?

The objective of this article is to offer a preliminary assessment of his prospects, based on the experience of other countries with economic conversion. While the Soviet Union is radically different from any other economy, it is likely that Gorbachev will face at least some problems that are similar to those confronted by other officials when they attempted to convert national industries from one type of production to another. If nothing more, the article will hopefully provide a framework for analyzing military conversion.

It might be added that, although conversion has not yet become a major political or economic issue for the United States or Western Europe, it may become one before too long, as defense spending cuts and disarmament proceed. Already, many defense industries are struggling to survive, and they are diversifying, merging, and desperately lobbying to keep their products in the procurement pipeline. It may be that at least some of them will be forced to consider exiting from the defense business altogether, facing executives with the choice of conversion or closure. Indeed, Representative Ted Weiss (D-NY) recently sponsored the Defense Economic Adjustment Act, which would require military contractors to formulate economic conversion plans as their defense programs terminate.

In examining economic conversion, some fundamental distinctions must first be made. The most obvious one that emerges is between *reallocation* of goods and services and *conversion* of production. Reallocation involves changing the destination of a particular type of output from the military to the civilian sector. In the Soviet Union reallocation is likely to be particularly important, since the military claims such a large share of raw materials and basic industrial resources, including steel, aluminum, and petroleum.

Even here, it must be noted, the process of reallocation is not a simple one; Gorbachev cannot simply dictate that more petroleum products be shipped to the civilian economy and less to the military. Take a refinery whose output consists of fuel oil, jet fuel, and gasoline. The mix of products will reflect the demand of the customers, in this case the military. Civilian demand will probably require a different mix, entailing changes in refinery operations. This is by no means straightforward.

Furthermore, the refinery now has a distribution system that reflects existing patterns of demand. As civilian demand displaces that of the military, distribution patterns must change. In the petroleum area, which requires a fairly extensive infrastructure, this is

a challenging task. Indeed, anyone involved in the energy business knows that the logistics of distribution are half the battle. Distribution issues will be discussed in greater detail below.

The point to make here is that even reallocation—which is perhaps the simplest and most straightforward conversion process—is hardly frictionless. Reallocation of production, even if it does not entail changes in industrial operations, as in our petroleum example, will entail new patterns of distribution, and these are going to be difficult to execute in a country with such enormous distribution problems as the Soviet Union.

A fundamental choice

The focus of this piece, however, is on conversion of manufacturing capacity. Based on the experience of such countries as the United States and France, it appears that public officials contemplating industrial conversion must begin by making a fundamental choice, and that is either to commit state intervention at the plant level with the objective of changing production from one good to another, or to close existing plants and retrain and relocate workers for other tasks. *A priori*, it is impossible to suggest which tack should be taken with a given plant. In some cases, it may be easier to cut than to convert.

Conversion is best viewed as a step-by-step process, and when viewed as such, the complications entailed in the process are fully illuminated. Each step involves discrete analytical tasks, which must somehow be incorporated into a larger plan of action. As an actual—as opposed to theoretical—economic problem, transforming guns into butter is fairly sophisticated. Indeed, the economic literature concerned with the marginal rate of transformation gives us little sense of the plant-level difficulties involved.

The conversion process requires that decisions be taken regarding which plants to convert, when they should be converted, and to what they should be converted. The economic and technical analyses involved at every stage are complex, given the number of variables involved. They are also dynamic, since changes occur over a relatively long period of time; if experience is any guide, the conversion process can take anywhere from one to ten years to complete.

To take an example, consider postwar French efforts to convert their naval shipbuilding to other activities. The French took the decision to convert a substantial portion of their shipyards to civilian production in the early 1960s, after the Algerian war; they planned to convert five of twelve active yards.

The first decision that had to be taken was which yards to convert and which to maintain. In making their choices, the French were concerned not only with efficiency questions, but also with regional economic balances. In many cases, shifts from military to civilian production involve layoffs, and labor politics naturally concerned successive French governments. Shipyards in the Mediterranean, for example, may have been better placed to weather the changes in employment than those in Britany, but it turned out that some of the yards in Britany were better adapted to conversion. From a political economy perspective, French officials had no choice but to consider the structural changes in regional economies that would occur as a result of conversion or shutdown.

The decision to convert having been taken—and the French converted shipyards to such tasks as smelting, forging, metalworking, scrapping, etc.—they found that in each case the conversion of enterprise required substantial capital investment. The state was required to make investments far higher than those initially projected, since the ease and degree of convertibility had been underestimated.

This proved especially problematic during the eras of fiscal stringency in the early 1960s and early 1970s. The Soviets, who suffer perhaps the largest budget deficit in the world as a percentage of GNP, would do well to think about the size of state investment that will be required to get the economic conversion process up and running.

Finally, in many cases the French found that their decision to convert conflicted with their hope of making the new operations self-financing. Again, this seems relevant to the Soviet case, given Gorbachev's insistence on self-financing of manufacturing industries. Although the output of the converted yard in some cases was in demand by the civilian sector, it proved that it would have been cheaper to expand the production of existing civilian plants rather than convert shipyards away from military to civilian work. The profits were low in many of the converted operations, requiring continual state intervention.

A shortage of trained manpower

But even these financial problems paled with the human resource ones. At the end of the day, human resources ironically proved the least transferable of

all. Depending on the age and educational background of the work force, retraining efforts were much longer than expected, and the ensuing productivity of the "converted" work force far lower than anticipated.

Furthermore, the French found that the labor mix for the new civilian plants was far different from that required by a military shipyard. The operations needed marketing directors, salesmen, distribution experts, quality control specialists, and so forth. These scarce resources were difficult to employ, since they were already much in demand in the civilian sector.

The Soviets already suffer from a severe shortage of workers trained in finance, distribution, and sales, and one wonders about their ability to recruit and train the type of workers that converted enterprises will require.

The French also came up against a host of infrastructure problems that involved substantial amounts of time and money to resolve. Phone lines, roads, and postal services had to be expanded and improved in the process of conversion. The distribution network involved in civilian sales was far different from what it had been with military contracting, entailing infrastructure support. All these changes stretched out the process way beyond projected time horizons.

In short, as the French looked back at their conversion experience a decade later, they saw a mixed bag. Among the shipyards converted during the 1960s, only one had managed to realize the process with minimal difficulty, and that was the one located in the port of Le Havre, an industrial zone that was undergoing massive expansion at the time. Again, the regional economy proved a decisive factor in the success of the conversion process.

In the other cases, the results were less than had been hoped for. In some cases, demand for civilian products had changed markedly by the time conversion had been effected, so that output was no longer needed. In other cases, the technology proved inappropriate for the converted yard, or outmoded by the time the process had taken place. In still other cases, the laborers proved hostile to change, basically blocking the process.

As one student of economic conversion in France, Jean Chardonnet, has concluded, "overall, there is no conversion policy in France; that is to say, a liaison between the decision to convert and the search for an appropriate solution, including the programming of the date of closure, the date of opening the replacement, and the retraining and organization of the labor force."

Economic conversion at home

The American experience after World War II provides additional insights into the conversion process. The United States began to plan for wartime demobilization as early as 1943. The issue of economic conversion soon became one of considerable political importance in this country; indeed by the late 1940s it was rated in public opinion polls as one of the most topical issues of the day.

In the United States the debate revolved around the societal and economic ends to which reconversion should contribute. Should it be primarily a tool to maintain employment, or should it be concerned with maximization of consumer goods production? Should industrialists be given free rein to return to business as usual, or should the converted firms be managed as a business-government partnership? Who would direct the conversion process—businessmen or government officials? For his part, Interior Secretary Harold Ickes suggested that the government establish a giant holding company—an American version of the Italian IRI—which would sell shares to World War II veterans.

One fact that must be recalled is the substantial ownership of plant facilities held by the U.S. government after the war. The government held title to 90 percent of the synthetic rubber, aircraft, and magnesium industries, and over 50 percent of the aluminum and machine tool industries.

In short, reconversion was a process of some consequence for the American political economy. Historian Gerald White has commented, "The ways these plants were transferred from wartime to peacetime service held the potential for economic and social change." As such, the policy debate was intense and ranged over a broad political spectrum.

Leaving the policy issues aside and focusing on the technical problems, the reconversion process also proved a difficult one for American businessmen. It turned out that much of the wartime plant and equipment was not readily transferable to civilian production.

Machine tools, for example, that had been engineered for the military were inappropriate for civilian production. Plant layout had to be altered for civilian output and a new manpower mix was needed; of course, the United States had the added problem of retraining veterans who displaced the wartime workers. The government found that it had to hire the best engineers in the country to make industrial surveys of

each and every plant under its ownership, in order to help speed the conversion process.

But this was not all. The government compared costs of civilian and military production for similar types of output, and it conducted research and development to find civilian uses for raw materials that had been used mainly by the military. It also conducted economic studies to determine the most competitive use of each military plant.

No easy task

The conversion process in the United States was neither neat nor swift. In the bureaucratic confusion that surrounded the process—and postwar demobilization more generally—it turned out that oftentimes plant and equipment were sold separately; the left hand did not know what the right hand was doing. While some equipment and machinery from one plant may in fact have proved useful in another located elsewhere in the country, its purchase was arranged before final disposition of the existing plant had been decided.

A particularly painful example of conversion was provided by the aircraft industry. During the war, aircraft production had expanded one hundred fold to become the nation's largest industry—four times larger than the peacetime automobile industry. By 1946 aircraft production had shrunk to 6 percent of its wartime peak. Although the government tried to sell or lease plant and equipment to civilian firms, peacetime prospects were too bleak to make such investments. As it turned out, many machine tools were sold as scrap, and plants shut down. In other cases, new automobile firms—like Tucker—bought existing plants, but few of these succeeded.

By 1949 the United States had largely accomplished the first stage of the conversion process—the result of six years of planning and political debate. Then the Korean War erupted, and once again the government mobilized its industrial capacity. It was not until the late 1950s that the government had basically completed its wartime conversion task.

Lessons to be learned

There are some important lessons to be drawn from the American experience with military conversion:

First, even given a postwar economic boom, the process proved to be difficult. Military manufacture was different from civilian production, and it turned out that much plant and equipment was less convertible than had been originally thought.

Second, plant location was an important factor in the success of conversion. In some cases it was better to dismantle a factory and sell off the tools separately than to convert the plant to new production.

Third, the labor mix required for civilian production was quite different from that used by wartime industry.

Finally, and perhaps most important from the Soviet point of view, conversion turned out to be a lengthy and costly process. The U.S. government devoted enormous resources—billions of dollars—to economic conversion.

In sum, the comparative perspective illustrates some of the difficulties that countries are likely to encounter as they begin to convert from military to civilian production. In order to succeed, thoughtful and sophisticated conversion plans must be drawn up, and one wonders about the ability of Soviet economists, engineers, and managers to conduct the necessary background studies.

Execution of the plans will require imagination, decisive leadership, and flexibility. None of these are in great supply in Soviet manufacturing, and there is no indication that military managers are enthusiastic about the conversion process. Indeed, we are already receiving reports about failed conversion efforts. A recent case involved a military plant that was being converted for use by the food industry; apparently, the effort has been abandoned.

At the same time, the Soviets have decided advantages that countries in the West lack. Prominently, Soviet military industries have traditionally been involved in civilian production. In many cases, it will take little effort to shift workers from military to civilian jobs. Second, the Soviet economy is so starved for civilian goods that almost anything the military industries turn out will be needed by consumers. Finally, despite ongoing political change, Gorbachev's decisive control over the country and its industries—both civilian and military—will be an asset in the process.

In conclusion, conversion is likely to present the Soviet president with challenges and opportunities. In some cases, he may find it easier to cut then to convert. In others, he may find it simpler to maintain military production and keep workers employed; if history is any guide, military Keynesianism has found no more hospitable environment than the Soviet Union. In still others, the conversion process will succeed. No matter what the outcome, officials and defense executives in the West would do well to follow the process.

THE POLITICAL ECONOMY OF NATIONAL SECURITY

A Global Perspective

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In wartime, the Defense Department plays a larger role in planning economic warfare. This will include the establishment of blockades and the strategic bombing of industrial targets. Since World War II, strategic bombing of industry has played a large role in U.S. war fighting. In fact, some of the important public officials engaged in target selection during World War II, such as Walter Rostow, returned to the government during the Vietnam conflict, and they attempted to apply the lessons learned from their earlier experience to southeast Asia.

During wars, efforts will be made to establish an economic quarantine of the enemy. During the Korean war, for example, the United States engaged in a widespread denial campaign against North Korea and Communist China. By invoking the Trading with the Enemy Act of 1917, the President prohibited American citizens from *all* dealings with these countries, and in the United Nations the United States called for other countries to do the same. The United States also conditioned its economic and military aid to foreign countries based on their participation in the embargo campaign.[49] Although the United States invoked the Trading with the Enemy Act against North Vietnam, it had little success winning alliance cooperation in this conflict, given differing views among the allies regarding the wisdom of the war effort.

It is interesting to ponder what will become of economic warfare as the world economy becomes more integrated and interdependent. The tools of economic denial only work when one side possesses something that another wants or needs. In the emerging global economy, however, there are fewer and fewer capabilities that are concentrated within a single geographical region.

Indeed, the embargo of Iraq during the Persian Gulf crisis may provide important lessons for economic warfare in the future. To the extent that the embargo and blockade succeeded in undermining Saddam Hussein's war economy, it was due to the near unanimous support of the United Nations. In a "unipolar" world where the United States had become the only great power capable of exercising military force throughout the world, more and more countries appeared willing to join with it in seeking collective goals. To be sure, there was "cheating" on the blockade as goods continued to flow to Iraq through Jordan, Iran, and other countries. But the largest part of Iraq's foreign trade had been cut off. At least one lesson seems clear-cut: in a global economy, economic warfare requires global support to succeed.

FROM GUNS TO BUTTER

At the war's end, or during a period when defense spending is in steep decline (as of this writing, for example), industrial societies will face the task of converting the military economy to civilian ends. In the United States, military industries have faced the prospects of conversion four times since 1944: after World War II, the Korean war, the Vietnam conflict, and the Reagan buildup. In the contemporary Soviet Union, which is still in the process of shifting from a wartime to a peacetime economy, conversion from military to civilian produc-

tion has been held out as an important policy measure for the restoration of overall economic health.[50]

Conversion is not merely a microeconomic task at the plant level, but it also has important macroeconomic and regional economic dimensions. Further, depending on the postwar political and economic climate, it may have an important international aspect, as foreigners invest in the country or provide economic assistance.

In the wake of sharp declines in defense spending, as occur after wars or rapid military buildups, public policy is faced with two major problems: first, the loss of demand for military goods and services; second, the matching of resources once employed by the military with new civilian requirements. The macroeconomic task will thus be to stimulate demand, while policies may also be created to facilitate the transfer of resources among industrial sectors. Governments must be fully involved in this conversion process if unemployment is to be contained and if a postwar recession is to be prevented.

Government policy to maintain economic growth and investment has five general instruments at its disposal: (1) tax policy, especially tax cuts; (2) monetary policy, specifically lower interest rates; (3) increased government purchases of nondefense items; (4) increased transfer payments and adjustment assistance to displaced workers and industries; and (5) export promotion policies.[51] The success of economic conversion at the plant and regional levels will largely be a function of these aggregate offset policies. The higher the general demand in the economy, the faster market forces will operate, facilitating the shift of resources from defense to commercial sectors.

These policies are not, however, sufficient to ensure a successful conversion. We must also consider regional economic balances, as well as the particulars of each industrial plant involved in the process. Even at these levels, central governments can play an important role in adjustment from a military to a peacetime economy

Conversion is best viewed as a step-by-step process; and when viewed as such, the complications entailed in the process are fully illuminated. Each step involves discrete analytical tasks, which must be incorporated into a larger plan of action. As an actual—as opposed to theoretical—economic problem, transforming guns into butter is quite sophisticated. Indeed, the technical economic literature on "guns into butter," which focuses on the problem of equalizing the marginal rate of transformation (i.e., the *ability* to turn guns into butter) and the marginal rate of substitution (i.e., the *willingness* of consumers to substitute butter for guns), gives us little sense of the enormous difficulties involved.

In practice, the conversion process requires that decisions must be taken regarding which plants to convert, when they should be converted, and to what they should be converted. The economic and technical analyses at every stage are complex, given the number of variables involved. They are also dynamic, since changes occur over a relatively long period of time; if experience is any guide, the conversion process can take anywhere from one to ten years to complete.[52]

To take an example, consider postwar French efforts to convert their shipbuilding to other activities. The French took the decision to convert a

substantial portion of their shipyards to civilian production in the early 1960s, after the Algerian war; they planned to convert five of twelve active yards. The first decision that had to be taken was which yards to convert and which to maintain. In making their choices, the French were concerned not only with efficiency questions, but with regional economic balances as well. In many cases, shifts from military to civilian production involved layoffs, which were especially problematic as veterans returned from overseas; labor politics was thus an additional factor in the equation.

These problems became especially acute on the Atlantic coast of Brittany; a region then suffering high unemployment. Some of the shipyards were not difficult to convert, but thousands might be left without jobs as a result. French officials had no choice but to consider the regional implications of each conversion decision.[53]

The decision to convert having been taken—and the French converted shipyards into such tasks as smelting, forging, metal working, and scrapping—they found that in each case the conversion of enterprise required substantial fresh capital injections. The state was required to make investments far higher than those initially projected, since the ease and degree of convertibility had been underestimated. This is a lesson that should not be lost on American and Soviet public officials as they contemplate conversion, since both countries are running large budget deficits.

Further, in many cases the French found that their decision to convert conflicted with their hope of making the new operations self-financing. (Again, this seems relevant to the Soviet case, given Mikhail Gorbachev's insistence that factories operate on a self-financing basis.) Although the output of the converted yard was in demand by the civilian sector, it proved that it would have been cheaper to expand the production of existing civilian plants rather than convert shipyards from military to commercial work. The profits were low in the converted operations, and they required continued state support.

Unfortunately, even these financial problems paled next to the human resource ones. Ironically, human resources proved the least transferable of all. Depending on the age and educational level of the work force, retraining efforts were much longer than expected, and the ensuing productivity of the converted work force was low. Furthermore, the French found that the labor mix required for the new civilian operations was different from that used by a military shipyard. The converted plant needed marketing people, salespeople, distribution experts, quality control specialists, and so forth. These scarce resources were difficult to employ, given existing demands for their skills. Bidding for these skilled workers created inflationary pressures, and indeed, inflation often accompanies the conversion process owing to the scarcity of factors of production.

Finally, the French also came up against a host of infrastructure problems that involved substantial amounts of time and money to resolve. Phone lines, roads, and postal services had to be expanded and improved in the process of conversion. Distribution networks had to be established. All these changes stretched out the process way beyond projected time horizons.

In short, as the French looked back at their conversion experience a decade later, they were disappointed. As one student of French economic policy has concluded, "Overall, there is no conversion policy in France; that is to say, no liaison between the decision to convert and the search for an appropriate solution, including the programming of the date of closure, the date of opening the replacement, and the retraining and organization of the labor force."[54]

The American experience after World War II provides additional insights into the conversion process; incidentally, conversion has become a major political and economic issue after each major downturn in defense spending. The United States began to plan for wartime demobilization as early as 1943. The issue of economic conversion soon became one of considerable political importance in the country; indeed, by the late 1940s it was rated in public opinion polls as one of the most topical issues of the day.

In the United States the debate revolved around the social and economic ends to which conversion should contribute. Should it be a tool to maintain employment, or should it be used to maximize consumer goods production? Should industrialists be given free rein to run the process, or should the converted firms be run as a government-contractor partnership (as a GO-CO plant, to use the contemporary acronym). For his part, Interior Secretary Harold Ickes suggested that the government should establish a giant holding company—an American version of the Italian IRI—which would sell shares to World War II veterans.

One fact to be recalled is the substantial ownership of plants held by the U.S. government at the war's end. The government held title to 90 percent of the synthetic rubber, aircraft, and magnesium industries and to over 50 percent of the aluminum and machine tool plants. In short, conversion was a process of some consequence for the American political economy. As one historian of the process has commented, "The ways these plants were transferred from wartime to peacetime service held the potential for economic and social change."[55]

The conversion process was also difficult at the plant level. It turned out that much of the wartime plant and equipment was not readily transferable to civilian production. Machine tools that had been engineered for the military were inappropriate for civilian production. Plant layout had to be altered for civilian output, and a new work force mix was needed; of course, the United States had a huge influx of veterans to train. The government ended up hiring hundreds of engineers who conducted detailed industrial surveys of each plant under its ownership, and these surveys provided recommendations for alternative uses.

The United States was still engaged in postwar conversion in 1950 when the Korean war erupted. Thus, six years after the process was launched, it was still ongoing. There are important lessons to be drawn from the American experience. First, even given macroeconomic policies that encouraged postwar growth, the conversion process proved difficult to execute. Second, plant location was a critical factor in the success of the process. In some cases it was better to dismantle a factory and sell the tools and equipment to an enterprise in a growing region than to convert the plant to civilian production. Third, the labor

mix required for commercial enterprise was quite different. Finally, conversion turned out to be a lengthy and costly process. The U.S. government devoted thousands of labor-hours and millions of dollars to postwar economic conversion.

Perhaps of more contemporary relevance to American defense manufacturers is the Vietnam experience. After the Vietnam conflict drew to its close, defense firms had a difficult time converting from guns to butter. On the macroeconomic level, the American economy was performing badly in the 1970s, suffering from a mix of stagnation and inflation—stagflation—that followed from poor economic policymaking in the wake of the Arab oil embargo of 1973 and the war's end in 1975. Scrambling for new niches in this dismal environment, defense companies experimented with various civilian pursuits outside their expertise, from building buses (Grumman) to bathtubs (Boeing). For its part, General Dynamics lost millions on commercial shipbuilding and asbestos mining.[56]

Based on a study of current defense industry strategies for coping with decline, the *Economist* magazine divides the prime contractors into three categories: "the hawks, who plan to remain as dependent as ever on defense, the doves, who intend to reduce their reliance on Pentagon business, and the turkeys, who haven't a clue."[57] The hawks include General Dynamics, Raytheon, and Martin Marietta; the doves are General Motors, Boeing, United Technologies, and General Electric; and the turkeys are the weak airframe manufacturers McDonnell Douglas, Grumman, and Lockheed; one could probably add Northrop, which is dependent for its livelihood on the controversial B-2 Stealth bomber program, to this list.

In sum, a comparative perspective illustrates some of the macroeconomic, regional, and microeconomic issues that countries are likely to face as they proceed with the shift from guns to butter. Success requires the right policy mix at all levels. Governments must enact aggregate offset policies that maintain demand in the wake of decreased defense spending, while assisting the regions and firms that are most seriously affected by the postwar adjustment problems.

CONCLUSION

During periods of mobilization and war, governments will seek to command a large share of societal resources for military operations. As James Schlesinger wrote thirty years ago, the efficiency with which scarce resources are used may provide states with the margin of victory in times of war and crisis. Even relatively small wars, like the Vietnam conflict, consume enormous resources in the modern age.

But the ability of governments to extract resources will depend in large measure on relations between the state and its society. There are limits to coercion even in authoritarian societies, and if citizens do not make common cause with their government, it will prove difficult to sustain hostilities. In this context, it is useful to recall Adam Smith's view that wars should be paid for out

of direct taxation rather than debt financing, since the willingness of citizens to be taxed provides a test of their belief in the war cause. During the Vietnam conflict, the American government attempted to finesse the people, paying for the war through deficit financing rather than increased taxes, thus shielding them from its direct costs. This strategy may have helped prolong the war, but ultimately it could not substitute for public support of U.S. soldiers in the field and the mission they were conducting.

When wars are over and defense spending declines, societies face the difficult task of turning guns into butter. Factors of production do not shift effortlessly from one task to another, and again governments will play an important role in facilitating the transfer and in maintaining aggregate demand. This is a critical point to emphasize, especially as a free-market-oriented administration (the Bush administration) must now direct a major downsizing of defense spending, with all the industrial and regional adjustments this entails.

This is not to say that liberalism does not speak to the war economy. To be sure, even in war, states must retain incentives for entrepreneurs and firms to create new technology, maximize output, and ensure quality control. And in the aftermath of war, market forces may well be the most effective method for allocating scarce resources. But the tools of neoclassical economics are unlikely to solve all the dilemmas posed by the political economy of mobilization, war, and reconstruction.

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SENATOR SARBANES. Thank you very much.

Don, we are very pleased to have you with us this morning. We would be happy to hear from you.

STATEMENT OF DON FUQUA, PRESIDENT, AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.

MR. FUQUA. Thank you, Mr. Chairman and Senator Bingaman. I appreciate the opportunity to appear before the Committee today to discuss some of the issues raised by the significant reductions in defense spending.

The Aerospace Industries Association, and I believe industry in general, shares the concern of Congress to promote economic stability as defense spending drops, to reduce the impact of reduced defense spending on workers and communities, and to utilize the skills and resources now devoted to defense and other endeavors.

The challenge of economic adjustment or economic conversion which we face today is different in many respects than the situation we faced after World War II, Korea, or Vietnam. However, if there is any lesson to be learned from the experiences after World War II, Korea, Vietnam, Panama or Iraq, it's that we cannot forego readiness. We do not know when, where, or under what circumstances, but there will be threats in the future which will require readiness to protect our national security interests.

National security doesn't mean just deterring an aggressor from attacking or engaging our Nation. It involves responding to regional threats, such as Granada, Panama, Iraq or others, which could ultimately endanger the security of a nation.

In responding to such threats — regional or otherwise — it will be important to win quickly and decisively with few casualties. I think the American people expect, and rightfully so, continued improvements in technology and training to enhance the superiority of our weapons and the safety of our troops.

I believe that Congress, industry and DoD share the following goals as we determine how to deal with the declining budget.

One, to ensure protection of our vital national security interests. And two, to promote development of technology. And three, preserve a skilled labor force as well as the defense-unique capabilities at both prime and supplier levels. And four, to sustain an ability to surge production when needed.

All of these are key factors in preserving a viable defense-industrial base.

The current and planned defense cuts have the potential to jeopardize that base, and it's important therefore that the downsizing of the defense industry be accomplished in a reasonable manner after decisions

are made as to what skills, facilities, critical suppliers and other capabilities need to be maintained to counter possible future threats.

We do not believe that the decline in defense spending by itself portends disaster for the economy as a whole or even for those companies which have been heavily committed to the defense business. We are confident that the marketplace will adjust, and that we can over time create new jobs to replace many of those lost in defense.

One of the critical factors here is time. We must be given reasonable time to do so.

As Norm Augustine, the chairman of Martin Marietta, stated in his testimony before the Senate Budget Committee earlier this year, and I quote: "We cannot manage a free fall."

We do not believe that the Federal Government should become involved in the strategic and business management decisions of the private-sector firms as the budget declines, nor do we believe that the current environment warrants singling out the defense industry for the kind of special government attention proposed in much of the legislation that we have reviewed.

Every effort should be made to provide defense workers and communities with access to programs that are available to constituencies affected by a variety of dislocations. Instead of setting up new councils and review bodies, it would be much better to use the resources to simply increase the fundings of existing proven programs, such as the Job Training Partnership Program, already in place in the DoD.

Those steps would be the simplest way to rifle assistance most directly to those in the greatest need.

Now, Mr. Chairman, you've asked that we also talk about the potential need for new programs and policies. We suggest two areas in which congressional action is needed.

First, Congress should eliminate as much as possible the barriers to exporting defense equipment to our allies around the world. It can do this by lifting anticompetitive restrictions, seeking to control the flow of weapons to technical information on a multilateral basis wherever possible, implementing export credit facility for defense products and minimizing recoupment charges on export sales, and supporting U.S. companies in foreign competition. In short, leveling the playing field in which we compete with foreign manufacturers.

A U.S. company in international competition helps to keep production lines alive, lowers cost, and keeps its supply base functional.

Second, Congress could eliminate the statutory requirements which inhibit the acquisition of commercial products and integration of military and commercial production, and also eliminate the unnecessary burdens that have been placed on the procurement process over the past decade.

Micromanagement of the acquisition process has significantly increased the cost and complexity of defense business and contributed to an adversarial relationship between industry and government.

Many of the current statutory and regulatory burdens over these years, the burdens are redundant, costly, and unnecessary. And they add cost without value to the products which a government buys and makes our industry less competitive internationally and discourages the advancement of technology.

We need to work together to establish a more cost-effective working relationship. Any relief from the burdens of micro-management of our industry which Congress can provide or help foster will reduce the cost of goods and services to the Defense Department and to the taxpayer, and at the same time, help encourage the maintenance of a financially healthy defense industrial base.

That concludes my statement and I would be happy to answer any questions at the appropriate time.

[The prepared statement of Mr. Fuqua follows:]

PREPARED STATEMENT OF DON FUQUA

My name is Don Fuqua and I am president of Aerospace Industries Association which represents the nation's manufacturers of commercial, military, and business aircraft, helicopters, aircraft engines, missiles, spacecraft, and related components and equipment.

I appreciate the opportunity to appear before this committee to discuss some of the issues concerning the aerospace and defense industry as we enter a period of significant reductions in defense spending.

AIA, and I believe industry in general, shares the concern of Congress to promote economic stability as defense spending drops, to reduce the impact of reduced defense spending on workers and communities, and to utilize the skills and resources now devoted to defense in other endeavors.

The challenge of economic adjustment or economic conversion which we face today is different in many respects than the situation we faced after WWII, Korea or Vietnam. After WWII there was a heavy demand for consumer goods which provided employment for those who had been engaged in the war effort and provided alternative use for many facilities and other resources that had been devoted to the war effort. The downturns after both Korea and Vietnam were not as drastic as after WWII, and they came at a time when the economy was healthier so the marketplace was able to

adjust and absorb the additional capacity and labor. The challenge we face today is that cutbacks are being made at a time when the economy is in recession, there are no significant consumer demands to be filled, and the skills and resources which are becoming excess are far more sophisticated and specialized than in the past and less capable of being readily converted to commercial use.

If there is any single lesson to be learned from the experiences after WWII, Korea, Vietnam, Panama and Iraq, it is that we cannot completely forego readiness. We don't know when, where or under what circumstances conflict may again occur, but history tells us we will probably never have worldwide peace and that there will be threats in the future which will require readiness to ensure our own national security. It is important that we have a clear understanding of what we mean by the term national security. We can't think of it solely in terms of deterring an aggressor from attacking or endangering our nation. In that respect, with the Cold War ended, most Americans feel secure and many favor even more dramatic cuts in defense spending then those already proposed. What we need to make clear is that national security, as a priority, involves responding to regional threats such as Grenada, Panama, Iraq, and others which could ultimately endanger our security as a nation.

In responding to any threats, be they regional or otherwise, the imperative will be to win quickly and decisively with few casualties. The American people expect, and rightly so, continued improvements in technology and training to ensure the superiority

of our weapons and the safety of our troops.

Thus, I believe Congress, industry and the department of defense share some mutual goals as we determine how to deal with a declining budget. Those goals are: 1) ensure protection of our vital national security interests; 2) promote development of technology; 3) preserve a skilled labor force as well as defense-unique capabilities at both prime and supplier levels; and 4) sustain an ability to surge production when needed. These are all key factors in preserving a viable defense industrial base. Of these four goals, I believe continued advancement of technology is the most important. We must continue as the world leader in technology, not only for our own national security, but to ensure competitiveness in a global market.

That leads me to another of the issues you wanted to discuss - the nature and magnitude of the effects of current and planned defense cuts. It would be difficult to assess the magnitude, but certainly the cuts have the potential to jeopardize the defense industrial base. It is important, therefore, that downsizing the defense industry be accomplished in a reasonable manner, after decisions are made as to what capabilities need to be maintained to counter possible future threats. It is even more important that particular skills, facilities, critical suppliers and other capabilities needed to ensure our national security are identified and retained.

Mr. Chairman, we know the defense industry is likely to see

a reduction of over one million jobs over the next several years, and I am certainly not suggesting that we should retain defense spending at any particular level just to provide jobs. The only justifiable reason for spending money on defense is to ensure national security. Those of us in the defense industry are confident that, together with our associates in the commercial sector, we can over time create new jobs to replace many of those lost in defense. One of the critical factors here is time. We must be given a reasonable time to do so. As Norm Augustine stated in testimony before the Senate Budget Committee earlier this year - "we cannot manage a free-fall."

We do not believe the decline in defense spending, by itself, portends disaster for the economy as a whole or even for those companies which have been heavily committed to defense business. We do not want to minimize the potential for dislocations due to the changes that are likely to occur in the 1990s. We believe the federal government must not become involved in the strategic and business management decisions of private sector firms as the budget declines. Nor do we believe the current environment warrants singling out the defense industry for kind of special government attention proposed in much of the legislation we have reviewed.

The case has yet to be made, in our opinion, for the kind of action called for by many of the legislative proposals now pending in both the House and the Senate. Some of the bills would require direct contributions by defense contractors to assist affected communities and workers. Others would be funded by separate

appropriations, or in part from DOD appropriations. Some do not impose a direct burden on defense contractors, but could become the vehicle for burdensome requirements such as continuing health insurance and other benefits for displaced employees. In addition, much of the proposed legislation calls for new layers of bureaucracy which would be counter-productive to the basic intent of aiding communities and workers. None of the legislative proposals makes the case for singling out the defense industry for this kind of treatment. Our member companies provide a number of services to assist employees whom they are forced to release, including retraining assistance; extending job benefits through periods of layoff; payout or loans from pension or 401(k) savings; and out placement assistance.

Rather than enact new legislation aimed solely at the defense industry, every effort should be made to provide defense workers and communities with access to programs that are available to constituencies affected by a variety of dislocations. Instead of setting up new Councils and review bodies, it would be a much better use of resources to simply increase the funding of existing proven programs such as the Job Training Partnership Program, and of offices such as the Office of Economic Adjustment which is already in place in the Department of Defense. These steps would be the simplest way to rifle assistance most directly to those in greatest need.

Mr. Chairman, you asked also about the potential need for new programs and policies. There are two things which Congress can do

which will not only ease the burden on the defense industry during this period of downturn, but will pay long-term dividends in terms of a more viable industrial base. First, Congress should eliminate, as much as possible, the barriers to exporting defense equipment to our allies around the world, including those barriers which make our industry less competitive. A U.S. company winning an international competition helps keep production lines alive, lowers costs, and keeps a supply base functional. The government should support such an effort since it serves national objectives. The government can do this by lifting anti-competitive restrictions, seeking to control the flow of weapons and technical information on a multilateral basis whenever possible, implementing an export credit facility for defense products, minimizing recoupment charges on export sales, and supporting U.S. companies in foreign competitions -- in short, by leveling the playing field on which we compete with foreign manufacturers.

Second, Congress should eliminate statutory requirements which inhibit the acquisition of commercial products and the integration of military and commercial production, and also eliminate the unnecessary burdens that have been placed on the procurement process over the past decade. Regulations controlling the defense industry have significantly increased the cost and complexity of doing business and contributed to an adversarial relationship between industry and government.

Congress needs to maintain reasonable oversight of defense spending, and we need to continue reasonable checks and balances in the system to guard against fraud, waste and abuse. However, many of the statutory and regulatory burdens which have been put in place in the past few years are redundant, costly, and unnecessary. They add cost without value to the products which the government buys, make our industry less competitive internationally and discourage the advancement of technology.

We need to work together to establish a more cost-effective working relationship. Any relief from the burdens of micromanagement of our industry which Congress can provide or help foster will reduce the cost of goods and services to the Defense Department and the taxpayer and will at the same time help ensure the maintenance of a financially healthy defense industrial base.

A good example of burdensome and counter-productive regulations is in the area of commercial products. DoD recently published a "simplified" regulation for acquiring commercial products, but it still contains over 100 provisions, most of which are based on statute. Even the simplest government contract for a commercial product contains 33 mandatory clauses. Unless Congress makes it easier and more attractive to sell to the government, many qualified firms will avoid the government market. Making it easier for commercial firms to do business with the Department of Defense will not only ensure that DOD gets more for its money, but will broaden the defense industrial base, particularly at supplier levels.

In that connection, I want to mention a project well underway to review all DoD acquisition laws. This effort is being carried out by a panel of procurement experts - sometimes called the Section 800 Panel. The panel was set up pursuant to Section 800 of the FY91 Defense Authorization Act introduced by Senator Bingaman. Its goal is to develop and submit to Congress in January 1993 a single, simplified and streamlined DoD acquisition law. Industry strongly endorses this effort toward a "new beginning" and I urge Congress to support it as well.

Mr. Chairman, that concludes my statement. I will be happy to respond to any questions you may have.

SENATOR SARBANES. Thank you very much.

We will go to Mr. Flaming and then to Mr. Bosworth, and then we will come with the questions.

STATEMENT OF DANIEL FLAMING, PRESIDENT, ECONOMIC ROUNDTABLE, LOS ANGELES, CALIFORNIA

MR. FLAMING. Thank you, Senator Sarbanes.

My testimony is based on research done by an inter-disciplinary team of workers under a grant from the United States Economic Development Administration. The purpose of our research was to provide findings, analysis and recommendations to help the Los Angeles County Board of Supervisors and its aerospace task force in mitigating problems created by defense reductions.

Federal funding for defense is falling sharply. Los Angeles County's share of this funding is dropping even more rapidly.

Our defense manufacturing in Los Angeles is heavily focused in a handful of large firms that have limited capacity to convert their resources to civilian applications. Further, there's a growing possibility that more of these firms will move significant segments of their work out of the Los Angeles region.

Aerospace is Los Angeles's most important manufacturing industry. It has been declining since 1987, and this rate of decline has accelerated every year since.

An industrial development strategy is urgently needed to help salvage the aerospace industry's capital investment and the economic productivity of its skilled work force.

More importantly, it could help spark a new dynamic growth trajectory in the region's economy. Los Angeles is at the cutting edge in developing new technologies in energy sources, electronics, space exploration, advanced materials, instruments, and other emerging areas of commercial activity.

It is creating new markets for emission control and transportation technologies as it establishes novel precedents for improving air quality.

Linking aerospace manufacture and capabilities to these budding industries is essential for Los Angeles's continued economic well-being. This high technology industrial network has unique national strengths. But many large firms that are hubs of interaction may be unable to diversify into commercial markets.

The most important requirement for an industrial development strategy is that it create incentives which stimulate and enable this network to restructure rather than to remain in its current configuration and decline to a fraction of its capacity.

Demand-driven strategies supported by federal resources are needed to make this possible.

With total employment of about 226,000 workers as of December, 1991, the aerospace industry represents 5 percent of Los Angeles County's total employment and 24 percent of its manufacturing jobs.

A survey we conducted in 1991 indicated that Los Angeles County's high technology firms have annual sales of approximately $30 billion. Aerospace is even more important than its sales would indicate because of the concentration of workers residing in the county.

Los Angeles County receives twice as much defense funding as any other county in the United States. In fiscal year 1990, 1,283 firms received 4,184 Department of Defense contracts worth $8.9 billion.

Los Angeles County's aerospace industry relies on defense for two-thirds of its revenue. The typical aerospace firm in Los Angeles sells 54 percent of its products to defense. Weighing this average by firm size, 65 percent of sales are to defense. For very large firms, the median dependency on sales to DoD is 97 percent.

A few large firms and major contracts dominate the industry, making it fragile and vulnerable. The ten largest firms received 80 percent of Los Angeles County's defense revenue in 1990, with the ten largest contracts amounting to 40 percent of that total.

We did an econometric simulation of the impacts of continued defense reductions through 1995 at the average rate of the last two years. The assumptions of this simulation reflect the dynamics of the Los Angeles County, but assume that there are not alternative investments of the federal defense savings.

If that's the case, the projected impact on Los Angeles County by the year 2001 include the loss of 184,000 jobs within the county, an increase of over $360 million in unemployment insurance costs, and approximately $150 million in welfare costs, a cumulative loss of personal income in the county's economy of over $85 billion, and a corresponding loss of nearly $23 billion in retail sales.

The losses would also include 122,000 fewer houses being built and $6.3 billion less in commercial construction.

Finally, there would be a cumulative loss of $2.27 billion in lost public sector sales and property tax revenues.

From 1988 to 1991, the pool of job seekers in Los Angeles County, registered with the public employment service, increased by 31 percent. And the proportion of this pool made up of aerospace workers increased by 360 percent.

Furthermore, during the same interval, the share of unemployed aerospace workers in the 31- to 44-year-old age range — an older age range that's much more rooted and much more damaged by layoffs — increased 86 percent as layoffs reached deeper into seniority ranks.

Workers now losing jobs in aerospace have better educations, broader competencies and more intensive training than in previous layoffs. But the transition to other jobs will be very difficult, often requiring extensive re-education and acceptance of lower pay.

One of the great dangers in this economic crisis is to respond with short-run, opportunistic and ultimately self-defeating remedial action. The other is to do nothing and presume that self-correcting dynamics of pure market forces will eventually bring the region back onto a course of economic growth and prosperity.

The world's strongest industrial growth centers obtain competitive advantage from the stabilizing influence of cooperative arrangements and region-wide manufacturing structures. These collaborative efforts help to create a stable playing field, predictable long-range goals, and enhanced flows of information.

Government plays a partnership role in creating superior developmental conditions for adaptable technologies and flexible organizations. One of the common characteristics of these mechanisms of economic coordination is that they foster a shared strategy for supporting industrial growth.

Beyond this, they vary in design and function because each takes advantage of unique institutions and strengths of its particular economy and culture.

Special endowments of Los Angeles that could be mobilized in a local economic development strategy that are aimed at diversifying the high-technology industrial base include the following:

One, a rich stock of aerospace industries with technological and manufacturing capabilities applicable to a wide variety of newly growing industries, such as electric cars, medical instruments, pollution control devices, robotics and so on.

Two, a dense network of subcontractors and specialized input providers in electronics, machinery, metal-working, plastics, advanced materials and other sectors.

Three, a large pool of engineering, technical and skilled craft labor.

Four, a large number of public and quasi-public agencies which are actively searching for a means of responding more positively to the needs of industry. This has already created momentum for an infant electric car industry.

And fifth, a highly developed urban region, equipped with abundant infrastructural services.

Up to this point, my description of an industrial development strategy for Los Angeles has focused on making optimal use of local and state resources. This is appropriate because the crucial unit of industrial competitiveness is the regional economy, and each region must find ways to build on its own strengths.

But even if state and local resources are coordinated to optimal advantage, it is likely to require at least a decade for this scale of economic stimulation to result in significant levels of job creation.

Based on our research, it is my recommendation that the Federal Government establish a policy objective of supporting industrial development strategies for major manufacturing regions of the United States

that are being adversely affected by defense reductions. This would include, one, supporting development of information bases and policy-brokering and research services required to develop and implement industrial development strategies. Two, making optimal rather than minimal matches between the skills and aptitudes of displaced workers and the requirements of new jobs. And three, use of federal funds to stimulate the demand for advanced technology products that meet important public needs and are responsive to the requirements of emerging commercial markets. This should include support for environmentally benign energy and power sources and for advanced transportation equipment being developed in the Los Angeles area. Thank you.

[The prepared statement of Mr. Flaming follows:]

PREPARED STATEMENT OF DANIEL FLAMING

TRANSFORMING A DEFENSE DEPENDENT INDUSTRIAL BASE

BACKGROUND

This testimony is based on research done by an interdisciplinary team of researchers under a grant from the United States Department of commerce Economic Development Administration to Los Angeles County. The purpose of this research was to provide findings, analysis and recommendations to assist the Los Angeles County Board of Supervisors and its Aerospace Task Force in mitigating problems created by defense reductions.

OVERVIEW

Federal funding for defense is falling sharply, and Los Angeles County's share of this funding is dropping even more rapidly. Defense manufacturing is heavily focused in a handful of large firms that have limited capacity to convert their resources to civilian applications. Furthermore, there is a growing possibility that more of these firms will move significant sections of their blue-collar production activities out of the Los Angeles region.

Aerospace, Los Angeles County's most important manufacturing industry[1], has been declining since 1987, and this process of decline accelerated during the 1990s. An industrial development strategy could help salvage aerospace's capital investment and the economic productivity of its skilled workforce by improving prospects for retaining current industries. It could also help spark a new, dynamic growth trajectory for the region's economy. Los Angeles is at the cutting edge in developing new technologies in energy sources, electronics, space exploration, advanced materials, instruments, and other emerging areas of commercial activity. It is creating new markets for emission control and transportation technologies as it establishes novel precedents for improving air quality. Linking aerospace manufacturing capabilities to these budding industries is essential for Los Angeles' continued economic well being.

This high technology industrial network has unique national strengths, but many large firms that are hubs of interaction may be unable to diversify into commercial markets. The most important requirement for an industrial development strategy is that it create incentives which stimulate and enable this network to restructure, rather than remain in its present

[1]Aerospace and high technology are used interchangeably in this testimony in referring to the following group of industries: Computer Equipment (SIC 357), Communications Equipment (SIC 366), Electronic Components (SIC 367), Aircraft and Parts (SIC 372), Guided Missiles and Space Vehicles (SIC 376), Search and Navigation Equipment (SIC 381), Measuring and Controlling Devices (SIC 382).

configuration and decline to a fraction of its capacity. Demand driven strategies supported by federal resources are needed to make this possible.

My remarks focus first on the ingredients of an industrial development strategy for the Los Angeles region, because industrial strengths grow out of the dynamics of regional economies, and conclude by focusing on the crucial role the federal government must fill to make this strategy viable.

SIGNIFICANCE OF AEROSPACE

With total employment of 226,300 workers as of December 1991, the aerospace industry represents 5% of the County's total employment and 24% of its manufacturing jobs. The Economic Roundtable survey indicated that in 1991, Los Angeles County high technology firms had annual sales of approximately $30 billion.

Aerospace is even more significant for Los Angeles County's economy than its employment and sales indicate. Aerospace workers earn from 10% to 20% more than their counterparts in the same occupations in other industries. Approximately 86% of the County's aerospace workers live within the County, as compared to 68% for the total County work force.

DEFENSE DEPENDENCY

Los Angeles County receives twice as much defense funding as any other county in the United States. In Fiscal Year 1990, 1,283 Los Angeles County firms received 4,184 Department of Defense (DoD) contracts worth $8.9 billion.

Los Angeles County's aerospace industry relies on the DoD for two-thirds of its revenue. The typical aerospace firm in Los Angeles County sells 54% of its products to DoD. Weighing this average by firm size, 65% of sales are to the DoD. For very large firms the median dependency on sales to DoD is 97%.

A few large firms and major contracts dominate the industry. The ten largest firms received 80% of Los Angeles County's defense revenue in 1990, with the ten largest contracts accounting for 40% of that total.

AEROSPACE PERFORMANCE

Aerospace employment fell by 47,100 jobs from 1988 to 1991, a loss of 17%. From 1987 to 1990 defense funds coming to Los Angeles County declined by about 20%, adjusted for inflation, and the number of contracts declined by 22%.

The kind of defense work being done in Los Angeles County is changing. DoD expenditures for products manufactured in Los Angeles County have declined from nearly $6 billion in 1987 to about $3.3 billion in 1990. Expenditures for Research Development Test and Evaluation, and for Services have remained stable or grown. Most of Los Angeles

County's defense business is now for Research Development Test and Evaluation Services. Without a production base this also will decline.

Much of the DoD revenue loss has resulted from reduced aircraft production. Defense funds are concentrated in the aircraft industry, but this industry's future prospects in Los Angeles County are bleak. Of thirteen aircraft produced or developed in Los Angeles County in the 1980's, only two, the B-2 and the C-17, are still active. Given that there is only one major new military aircraft program anticipated until well into the twenty-first century, aircraft production in Los Angeles County may end with completion of the C-17 program.

COMMUNITY IMPACTS

In the absence of domestic investments of defense savings, continued decline in DoD expenditures through 1995 at the rates experienced in 1990 and 1991 is projected to create impacts by 2001 that will include:

- Residual loss of 184,000 job in the County.
- An increase of $362.8 million in Unemployment Insurance and $147.4 million in Public Assistance costs over the coming decade.
- Cumulative losses to Los Angeles County's economy between 1992 and 2001 of $86.4 billion in personal income and $23.8 billion in retail trade.
- The construction of 122,000 fewer houses and $6.3 billion less in commercial buildings.
- Cumulative losses of $2.27 billion in public sector sales and property tax revenue.

Every eight dollars in lost defense revenue will cause a twenty-eight dollar loss in the County's economy as well as a one dollar increase in costs and lost revenue for state and local government.

LONG TERM PROSPECTS

The aerospace-defense industry grew rapidly in Los Angeles County over the post-war decades. The industry suffered periodic cyclical downturns, but until the late 1980s, these downturns were always reversed by upturns in federal defense spending. The projected decline in defense spending over the 1990s will have a strongly negative impact on employment in Los Angeles County. This impact will be greatly magnified by multiplier effects extending from the aerospace-defense complex to other industries in the region. At the same time, there has been a long-term increase in the share of the County's employment base that is accounted for by non-defense jobs. This circumstance provides enhanced opportunities for viable local economic development strategies.

INDUSTRIAL DIVERSIFICATION

Large defense firms are not easily able to convert their technology and manufacturing resources to commercial projects. Large scale industry diversification will require the public sector to become a central player in stimulating and guiding technology commercialization.

The best growth prospects for the County's high technology industries are found in smaller firms. Most smaller firms, which are also the least dependent on DoD, anticipate employment growth in the next five years; most larger firms anticipate employment loss. Smaller firms are developing diverse commercially viable products that cross industry boundaries and seldom are dependent on DoD.

Restrictions on open communication and collaboration that have been ingrained in defense contractors by DoD are slowing the pace of technological innovation in the County's high technology industrial complex. One of the key challenges for Los Angeles is finding ways to foster a stable, confident industrial environment that encourages collaborative rather than insular relationships in its high technology industrial complex. Other regions of the United States, Europe, and Japan have developed collaborative industrial networks; los angeles county is challenged to foster similar cooperative relationships.

IMPACTED WORKERS

From 1988 to 1991 the pool of job seekers in Los Angeles County registered with Employment Development Department increased by 31%, and the proportion of this pool made up of aerospace workers increased by 360%. Between 1988 and 1991 the share of unemployed aerospace workers in the 31-44 year old range increased by 86% as lay-offs reached deeper into the seniority ranks.

Aerospace lay-offs are cutting proportionately across all occupational groups: Managers 7%, Professional and Technical 38%, Clerical 14%, Production 38%. Minorities make up 53% of laid-off aerospace workers.

In 1991 nearly 2,000 high tech jobs were lost each month, with an aggregate loss of 54,200 jobs since 1988. Throughout 1990 a weekly average of 6,813 unemployed aerospace and high tech workers in Los Angeles County received Unemployment Insurance.

REEMPLOYMENT OPPORTUNITIES

Workers now losing jobs in aerospace have better education, broader competencies and more intensive training than in previous lay-offs, but the transition to other jobs will be very difficult, often requiring extensive reeducation and acceptance of lower pay.

Thirty-eight percent of laid-off aerospace workers will probably have to change occupations and be retrained in order to find a new job. Seventy-six percent of those workers needing

retraining will require from 6 to 18 months of training to obtain jobs at a skill level comparable to their old jobs.

There are not any industries doing large scale hiring that could absorb aerospace workers. To find new jobs it is necessary to analyze skills of individual workers, examine the local labor market potential for those skills, look at possible alternative occupations, identify industries offering the best job potential, and make use of specific types of training to enhance employability of the individual worker.

DYNAMICS OF INDUSTRIAL GROWTH CENTERS[2]

One of the great dangers in this economic crisis is to respond with short-run and opportunistic (and ultimately self-defeating) remedial action. The other is to do nothing and presume that self-correcting dynamics of pure market forces will eventually bring the region back onto a course of economic growth and prosperity. The recent decline of manufacturing in the US Rustbelt has shown that once activated, the processes of deindustrialization often become chronic. Moreover, some of the most successful economies of the late Twentieth Century (e.g. Germany or Japan) are those that have learned how to supplement market forces with potentiating institutional structures. These institutions have helped promote high levels of worker skill, rising productivity, and superior product quality. Los Angeles can no longer afford to neglect the example of its competitors who have relentlessly and effectively used public policy to push industrial development and compete in international markets. The world's strongest industrial growth centers obtain competitive advantage from the stabilizing influence of cooperative arrangements and region-wide manufacturing structures. These collaborative efforts help to create a stable playing field, predictable long-range goals, and enhanced flows of information. Government plays a partnership role in creating superior developmental conditions for adaptable technologies and flexible organizations. One of the common characteristics of these mechanisms of economic coordination is that they foster a shared strategy for supporting industrial growth. Beyond this, they vary in design and function, because each takes advantage of unique institutions and strengths of its particular economy and culture.

Dynamic industrial regions are typically organized as strongly-interacting network systems and local labor markets. So long as the central motors of growth are operating, this characteristic binds producers powerfully to particular places, creating localized poles of intense economic activity. The result is a transactions-intensive industrial agglomeration marked by many-tiered ripple effects as firms buy from and sell to one another. Even at the best of times, however, these complexes, when left to their own devices, are susceptible to severe internal market failures on a variety of fronts (e.g. in areas of new technology development, worker training, information flows, premature lock-in of inferior developmental trajectories, and so on). And when the central motors of growth themselves begin to unwind (in the case of contemporary Los Angeles because of both declining DoD

[2]The following discussion of industrial networks and strategies for building on competitive strengths draws on work done by Allen J. Scott, who is director of the Lewis Center for Regional Policy Studies at UCLA, and was a member of the research team.

expenditures and a heightening of foreign competition) then the multiple interdependencies of the whole system give rise to massive dislocations.

As Michael Porter has argued in a recent influential book[3], nations and regions gain competitive advantage when they have dynamic specialized industrial agglomerations (with their intense systems of external economies). However, their dynamism is typically an asset that is held jointly by all participants in the economy. It depends, of course, on individual efforts, talents, and skills; but it also depends in a major way on the synergies that exist within the system as a whole. These synergies are a legitimate and indeed pressing object of public policy. Such policy when badly designed can be worse than useless; when it is well-designed it can greatly enhance the synergistic effects of the whole system and contribute significantly to local growth. In general, public policy in this area needs to deal with three very broad issues which are particularly susceptible to market failure, and where, in the absence of effective intervention, costly instabilities and unpredictabilities can occur:

- *Scale.* Many firms are too small to sustain critical services such as labor training, research and development, international marketing, and so on. However, when they are organized in association with other firms, efficient provision of such services can be secured.
- *Scope.* Firms embedded in dense network systems face many problems of information flow. It is costly to obtain accurate information. It is difficult to scan all potential sources of information, and the fiduciary standards of any information received may be doubtful. These problems are especially acute in industrial agglomerations where much commercial and technological development depends critically on effective inter-firm transacting. This is an area, again, in which it is possible to construct very efficient private-public partnerships in the interests of competitive advantage on wider markets.
- *Strategy.* Modern development theory suggests that at certain stages in a region's development it may face a wide variety of possible growth trajectories. Over time, a particular trajectory tends to become "locked-in" in the sense that it becomes extremely expensive and difficult to move onto another developmental path. For example, an argument might be made that some segments of the Los Angeles economy (in particular, the burgeoning sweatshop component) have since the early 1960s become locked into such a trajectory; declining wages, skills, and productivity, now represent a self-engendering downward spiral. A well-designed policy could - in principle - reverse this trend. As the Japanese and European experiences have shown (and indeed as the DoD itself has amply demonstrated in the past) it is possible to put into place structures of governance which support long-term strategic interests and curb damaging "spontaneous" tendencies.

Institutions for supporting industrial growth are most effective and viable when built upon existing social standards. Their purpose is to help each region realize the productive potential of its own unique specialized work force, entrepreneurial talents, and networks

[3]Michael E. Porter, The Competitive Advantage of Nations, New York: The Free Press, 1990.

of inter-industrial relationships. They achieve this purpose by filling collective needs which cannot be efficiently supplied through normal market channels.

BUILDING ON STRENGTHS

There are great difficulties in any attempt to achieve basic local economic transformations. The most realistic strategy is to build incrementally on the existing industrial base and labor force. Each region must determine what precise mixture of market relations, corporate self-management, and public-private partnerships provides the most desirable framework for development.

Well-designed institutional structures for containing market failures and increasing coordination will both capture latent positive benefits and diminish negative impacts caused by the external economy. Specific areas and problems that call for particular attention by means of a coordinated approach involve the following:

- The production of appropriate forms of technological research and its transformation into commercializable products.
- Programs for the provision of expert assistance in making incremental improvements in manufacturing processes and products.
- Collective agreements about intellectual property rights as a basis for collaborative research and development programs.
- Development and upgrading of labor skills and the more creative involvement of workers in production processes.
- The development of an infrastructure of support services for small manufacturers, including the provision of marketing and exporting services.
- The elaboration of inter-firm networks for cooperation and information exchange.
- Local government programs which offer support to manufacturing activities through the active initiation of suitable development projects (e.g. the creation of new science parks), and more effective land use management and servicing.
- Increasing the predictability of the business environment by providing reliable assurances about future regulatory requirements, availability of financing, and guaranteed procurement commitments for new products.
- The active use of local procurement strategies to support the growth of industry.
- The provision of high-risk capital for promising start-up businesses and loans for small businesses.
- Strategic monitoring of new industrial opportunities for the region and an early warning system for industries that are beginning to fail in the competitive race.

As a matter of principle, efforts to develop industrial growth centers should always try to build upon special local endowments, the most important of these being existing stocks of manufacturing capacity and expertise. It is also probably unwise to attempt to reproduce forms of industrial activity that are already highly-developed in other regions. The many examples of localities that tried - and failed - to become the next Silicon Valley add force

to this proposition. More generally, the first mover advantages and acquired external economies of existing agglomerations make it difficult to clone them at other locations.

The special endowments of Los Angeles that could be mobilized in any concerted local economic development strategy aimed at diversifying the high-technology industrial base include the following:

- A rich stock of aerospace industries with technological and manufacturing capabilities applicable to a wide variety of newly-growing industries, such as electric cars, medical instruments, pollution control devices, robotics, and so on.
- Dense networks of subcontractors and specialized input providers in electronics, machinery, metal-working, plastics, advanced materials, and other sectors. These networks are likely to be one of the primary bases of any major new growth industry, since their very structure is highly flexible and adaptable.
- A large pool of engineering, technical, and skilled craft labor.
- A large number of public and quasi-public agencies (South Coast Air Quality Management District, Los Angeles County Transportation Commission, the utilities, local governments, and other regulatory bodies) who are now searching actively for a means of responding more positively to the needs of industry. Already, this search has produced significant momentum around the infant electric car industry in the region.
- A highly-developed urban region equipped with abundant infrastructural services.

OBSTACLES TO PUBLIC SECTOR SUPPORT OF HIGH-TECHNOLOGY INDUSTRIES

Despite its technological and industrial capabilities, Los Angeles must also overcome formidable institutional barriers to the achievement of goals of economic diversification, regeneration, and renewed growth based on public policy. These barriers include:

- The marked underdevelopment (especially when compared to other parts of the USA such as Pennsylvania or Massachusetts) of broadly-based coalitions for supporting local industrial growth.
- As a corollary, the lack of effective centers of power which see it as their responsibility to ensure that new industries develop in Los Angeles.
- The difficulties of establishing a consensus about a common civic agenda.
- Failures of leadership in the business sector. The business sector does not speak or act in a unified manner, even on matters of fundamental self-interest. Moreover, whereas Los Angeles has some 400,000 business establishments, there are relatively few large firms headquartered in the region and many of them do not have fundamental long-run commitments to Los Angeles.
- Divergent and fragmented political leadership. Los Angeles is governed by the County, special regulatory districts, special-purpose districts, and nearly a hundred city governments, and it receives state and federal representation through 24 Assembly districts, 13 State Senate districts, and 17 Congressional districts. This represents a potentially powerful political force but it is difficult to achieve unity,

especially when there are few historical precedents and when the way forward is fraught with innumerable problems and unknowns.

- The absence of statistical information about the regional industrial base and labor market that is needed to support "real time" strategic responses to economic change.
- The severe lack of a knowledge base in local government agencies about basic technological and manufacturing issues. This lack hampers effective decision-making.
- Limited institutional experience in forming partnerships between representatives of industry, local government, academia, and other relevant parties for the purposes of local economic development.
- The decision of many prime contractors to respond to recent defense reductions by cutting their labor force and adopting an economically-defensive posture rather than to seek actively to adapt their technologies and manufacturing facilities to new commercial markets. Fortunately, there are some outstanding exceptions to this observation.
- The past habituation of defense industry managements to high levels of overhead and cost-plus pricing strategies. These habits are a severe impediment to competitive success on commercial markets.
- The concentration of the defense industry in a handful of large prime contractors (ten of these account for 80% of all local defense revenues). This concentration increases the vulnerability of the region to any weaknesses among major producers. Successful modern flexible production agglomerations, by contrast, tend to be characterized by a much more diffuse pattern of manufacturing activity.

Historically, the Los Angeles region has had an overtly *laissez-faire* approach to industrial development (though the involvement of the DoD did in fact constitute an overarching *de facto* industrial policy that provided stability and continuity of purpose). Certainly, the region has not yet developed institutions capable of implementing an industrial development strategy that addresses directly its current problems and predicaments. Social and cultural resources previously unconnected with industrial development will now have to be harnessed to provide a stabilizing framework for supporting growth of the high-technology industrial sector.

FORGING AN INDUSTRIAL DEVELOPMENT STRATEGY

The defense industry in Los Angeles has an abundance of workers with advanced skills that could be applied to a broad range of new industrial endeavors. However, there is much inertia in the local industrial system that impedes the full realization of these possibilities. At the same time, local governments have been extremely reluctant to direct or plan any form of regional industrial development. A middle ground needs to be found between the rigidities that have up to now characterized the defense industry, and the attitude of noninterference on the part of the public sector. Moreover, public officials in the Los Angeles region have in the past been ambivalent about the defense industry, offering uneven support at the national level for defense procurement funding, and paying very little

attention to the industry at the local level. The stance of Los Angeles has been to accommodate, and benefit from, defense-related manufacturing. But this stance has not been clearly defined or consistently supported. The current defense-industrial complex in Los Angeles is an artifact of social circumstances which include:

- Polarized public views about the desirability of defense spending.
- Absence of creative linkages with local government.
- Labor-management relations that have frequently been adversarial.

If Los Angeles is to promote successfully the development of high-technology industries without the benefit of massive defense revenues, it will have to provide more support than it has provided for aerospace. The first crucial lesson from past political polarization over support for the defense industry is that the region must identify goals for its high technology industrial complex that are broadly supported rather than divisive. The second is that local government must become constructively involved in supporting the competitiveness of this sector. The need to define widely-supported industrial development goals represents an opportunity to discover and rationalize the priorities of the region. Paradoxically, the fading away of the Cold War will probably facilitate a more consensual politics around these issues than was the case in the past.

COLLABORATIVE PROBLEM-SOLVING

Creating regional consensus around an industrial development strategy is a make-or-break task for preserving the competitiveness of Los Angeles' high technology complex. This is a prerequisite for establishing long-range goals that can provide a stable frame of reference for public sector coordinating activities. This inter-institutional collaboration will require participants to adapt to an enriched, more complex political/administrative process which links a broad vision of the public interest with the maze of practical detail that characterizes public programs. Four ingredients are required to formulate and act upon this collaborative agenda. They involve (1) development of consensus, (2) overall coordination of decision-making, (3) an ability to build incrementally in stages, and (4) centralized monitoring of trends.

First, a unifying and sustainable vision of the public interest must be offered. It has been common for public interests in Los Angeles to be framed in ways that are adversarial rather than unifying. A familiar example is the assertion that there is an either/or choice between economic growth and competitiveness on the one hand, and public goals for the achievement of environmental quality and social equity on the other hand. These polarized priorities can in part be reconciled through a unifying industrial development strategy. Environmental compliance could become a springboard for retooling with clean technologies that conserve materials and reduce waste, and investments in worker skills and employment services could be recognized as yielding high dividends through reduced social dependence and increased productivity. This restatement of issues to integrate the goals of different sectors of the public interest is more intellectually complex but it offers a realistic view that works ultimately to the advantage of all parties.

Second, an incisively framed set of ideas must be offered, and it must have enough social importance to mobilize different groups and interests. Many public sector programs have ambiguous or mismatched statements of goals resulting from a lack of clear direction about how costs and benefits should be distributed. Narrowly focused and fragmented responses to economic development issues are a clear sign of this problem. The Los Angeles County Transportation Commission is debating whether or not it should be concerned with the industrial development potential of its expenditures. The South Coast Air Quality Management District is beginning to examine how it should offset the socio-economic impacts of its regulatory strategies. And school districts and job training jurisdictions are offering programs which very imperfectly match local labor market conditions and needs. The County remains a major stake-holder in each of these areas of public policy, but has not yet offered leadership that would provide a unifying purpose, even though erosion of the manufacturing base is imposing on the County both dramatic increases in costs for social dependency and reduced revenues for defraying those costs. The goal of retaining a strong industrial base and a productively employed work force has enough social importance to mobilize each of these sectors; what remains is to frame this goal in a manner that embraces the core objectives of these public sector organizations.

Third, the formulation of a workable industrial development strategy must unfold in a way that allows the participants to move a single step at a time beyond the known. Each step should build on, and move a little beyond what each participating institution already knows and is familiar with. Each step should offer enough challenges to hold the attention of the main parties, but it should not be completely unfamiliar and, therefore, too uncertain. At this point there is general public awareness that the issues of mass transportation, environmental quality, alternative energy vehicles, and job creation for high-technology workers are all interrelated. A feasible next step would be to frame an inclusive statement of public goals for achieving clean air and adequate transportation for a skilled, economically self sufficient work force in a growing high-technology industrial complex. These goals should be stated in sufficient detail to guide decision-making for all relevant areas of public policy.

Fourth and last, a policy brokering and research service must be available in the form of a bridging organization that understands the policy environments of participating public agencies and can assist them in translating policy objectives into their own frames of reference. This brokering service should initiate inter-institutional dialogue and collaboration around areas of overlapping responsibility or concern. It should also be a source of relevant, reliable strategic data about the County's industries and workers, and should assist public agencies in systematically applying shared policy objectives and strategic data to decisions affecting industrial development. Such data are essential because policy-driven decisions (as opposed to systems-maintenance decisions) about industrial development require constant assessment of the economic environment and of the impacts of policy decisions on that environment. This is particularly the case because the limited resources of local government are only one of many forces affecting industrial competitiveness, and these resources are fragmented among multiple institutions in the County.

KEY INSTITUTIONS IN THE PUBLIC-PRIVATE PARTNERSHIP

The institutional structure for high-technology industrial development in Los Angeles should be created through a voluntary partnership of industry, government, and research universities. These entities are proposed because they are centrally-relevant institutions with a long-range stake in the regional economy. But there is little precedent for these institutions to assume this role or participate in such a partnership.

Within the government sector, Los Angeles County covers much of the affected industrial base and bears much of the cost of social dependency resulting from unemployment. Other public sector participants should include cities within the County, the Air Quality Management District, the Business-Transportation and Housing Agency and other appropriate State Departments, congressional representatives, the California Institute, and federal agencies concerned with economic development and technology advancement.

The three research universities in Los Angeles County, UCLA, USC, Cal Tech, have strong capabilities for managing and researching technology- and manufacturing-related issues. Each of these universities is affiliated with the California Council on Science and Technology, which is formulating technology development and commercialization strategies on a state-wide scale. These organizations should be enlisted to guide public sector decisions related to the development of local industry.

The industry nucleus for this partnership should include large firms with a long-term stake in the Los Angeles economy. This includes utility companies, banks, petroleum companies, and aerospace companies that are committed to remaining in the County. In addition, the voice of small business should be given a major hearing.

Creation of this coordinating institution will depend on enlisting industry and universities and then mobilizing an expanded coalition that includes federal and state political leaders, special jurisdictions such as air quality and transportation agencies, and business firms in the advanced technology sector.

THE NEED FOR FEDERAL PARTICIPATION

Up to this point the description of an industrial development strategy for the Los Angeles area has focused on making optimal use of local and state resources. This is appropriate because the crucial unit of industrial competitiveness is the regional economy, and each region must find ways to build on its own strengths. But even if state and local resources are coordinated to optimal advantage it is likely to require at least a decade for this scale of economic stimulation to result in significant levels of job creation. This estimate is based on experience in other regions, where it has taken six to eight years for seed capital programs to begin producing jobs. Los Angeles has already lost 60,000 aerospace jobs, and unless the economic equation is significantly altered it will lose many more jobs over the coming decade.

By integrating national support for crucial technologies, such as fuel cells, with the regional industrial development strategy proposed for Los Angeles it would be possible to avoid the economic and industrial damage that would be caused by likely elimination of over half the jobs in the nation's largest research and development complex.

The House Science Committee has recently approved amendments to H.R. 4559 which would establish at the Department of Energy a comprehensive program to develop and bring to the marketplace cars, trucks, buses and other motor vehicles powered by fuel cells. Federal programs of this kind that assure a demand for products in emerging markets are needed to help reshape the high technology industrial network in Los Angeles. Support for fuel cell research would be particularly valuable because Los Angeles is creating global precedents in requiring zero emission vehicles, thereby creating a new market, and research institutions in this region are at the forefront in developing commercially viable monolithic solid oxide fuel cells, as well as low cost, high efficiency direct oxidation fuel cells. Federal support for rapid development of this critical technology could be used, in combination with local and state efforts, to stimulate a much needed and highly competitive restructuring of Los Angeles' defense dependent high technology industrial complex.

The availability of federal funds to support a high technology industrial development strategy for Los Angeles may well be the factor that determines how deep and how prolonged this area's job losses from defense reductions will be.

ACTIVITIES OF THE PUBLIC-PRIVATE PARTNERSHIP

Three clusters of activity should take place under the auspices of the government-industry-university partnership: (1) a large-scale research and commercialization program, (2) a small business assistance program, and (3) provision of strategic information.

1. The research and commercialization program should be implemented through a newly created Consortium for Clean Energy and Power Sources made up of research universities, participating firms, and local government. Public research funds, together with matching industry funds, should be channeled through the consortium to support research and development of fuel cells, advanced batteries and other technologies for electric vehicles and clean energy sources.

2. The small business assistance program should facilitate new business spin-offs from large aerospace firms and provide support to high technology entrepreneurs and small businesses in the form of commercial counseling and assistance and financial support based on careful review.

3. Strategic information services should include: assistance in matching customers and suppliers to form new industry networks; provision of fine grain, current information on the structure of industry networks, and the direction and nature of industry and labor market changes; facilitation of the interface between industry, universities and government; and integration of public sector policy objectives.

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The economy of Southern California is currently at a critical turning point in its history. A variety of possible alternative future pathways of development now seem to be opening up. One of these involves a scenario of extended industrial decline as Department of Defense cutbacks bite more deeply into the region's economy, and as foreign competition in aerospace-defense products becomes ever more intense. In this scenario the region is likely to be faced with increasing, major losses of high-paying skilled and semi-skilled blue-collar jobs while an expanding sweatshop sector takes the region down the path of low wages, low levels of skill, and low productivity. As extreme as this scenario may appear to be, elements of it are already strongly perceptible in the industrial landscape of Southern California. Another possible scenario is one in which the region, building on its acquired endowments and talents, moves towards high levels of industrial innovation, where wages, skills, product quality, and productivity begin to rise upwards, and where the region climbs once more to mastery of international markets in its main industrial products.

Policy can make a crucial difference in how the region's economy evolves over the 1990s, and in determining what elements of these two scenarios will come to characterize its future course of development.

RECOMMENDATIONS

It is recommended that the federal government establish a policy objective of supporting industrial development strategies for major manufacturing regions of the United States being adversely affected by defense reductions, as proposed in this testimony, and that it take the following actions to implement this policy:

1. Support development of information bases and policy brokering and research services required to develop and implement industrial development strategies.

2. Make optimal rather than minimal matches between the skills and aptitudes of displaced defense workers and the requirement of new jobs. This should include effective assessments of individual workers, use of current labor market data, integrated and cooperative use of all retraining resources, and long-term retraining of workers from all skill levels who face barriers to reemployment so that they can reenter the work force in a skilled capacity.

3. Use federal funds to stimulate the demand for advanced technology products which meet important public needs are responsive to the requirements of emerging commercial markets. This should include support for environmentally benign energy and power sources and advanced transportation equipment being developed in the Los Angeles area.

SENATOR SARBANES. Thank you very much. Mr. Bosworth, please proceed.

STATEMENT OF BRIAN BOSWORTH, MANUFACTURING RESOURCE CENTER, TUFTS UNIVERSITY

MR. BOSWORTH. Thank you, Mr. Chairman, for the opportunity to testify today.

I work as an independent consultant, and my statement today reflects several years of experience in economic development generally and industrial modernization, specifically. It further summarizes some very recent work that I've done under contract with the Manufacturing Resource Center at Tufts University.

Some statements regarding the special problem facing the New England region, as the Nation contemplates a major reduction in defense spending, are included in my written statement. I won't summarize them here.

But it's clear that manufacturers in New England face a double-whammy. They are being challenged to compete in an international economy against far tougher standards of price, quality and dependability than they have ever faced domestically, and at the same time, one of their largest customers — the defense industry — will probably cut back purchases by as much as 50 percent or even more over the next five to ten years.

The small- and medium-scale firms that make up the industrial base of New England and much of the Nation are simply not changing rapidly enough to cope successfully with these threats. The mechanisms that could help them — the policies and programs that could foster manufacturing modernization — are not in place.

The regional manufacturing economy in New England, like in much of the rest of the country, is increasingly made up of small firms. For example, of the 26,000 manufacturing establishments in New England, 91 percent of them employ fewer than 100 people. Eighty-one percent of them employ fewer than 50 people.

Employment in these small firms has grown rapidly over the past several years, while employment in the large firms has declined even more rapidly. The number of small establishments has actually increased by 17 percent over the past ten years.

The flexibility and responsiveness of small firms could make them very competitive. But these firms are failing to modernize quickly enough to capitalize on these advantages. New England small firms need help across several dimensions of technology, human resources, marketing, finance and business relationships. They need to incorporate total quality management into their performance to meet tough international standards. Without a strong supplier base of small firms, the

larger ones will not prosper in New England and the new ones will not locate there.

Markets for manufactured goods are highly segmented, extremely volatile, and they are international in scope. They require customized products, meeting exacting standards of performance and dependability. The primary focus of competition has shifted from cost to quality.

While the New England manufacturers can no longer depend on traditional markets, including the defense industry, the demand for high value-added industrial products remains strong. Firms that can manage the transition to higher skills and technology can do well in these new niche markets.

In fact, smaller organizations may often have decided advantages over big ones. They can be more agile, more immediately able to respond to market or technology shifts, more nimble in spotting emerging market niches, and more flexible in rapidly shifting production to meet new opportunities. But smaller firms lack the sensing mechanisms of larger ones.

In New England, as in the rest of the United States, it is in this small manufacturing sector that the performance gap between best-practice firms and average is the widest. Many of the larger manufacturers have made important strides in modernizing their plant and equipment, upgrading the skills of the workers, and instituting new approaches to manufacturing quality. But the small firms are not making the transition.

All the available evidence suggests that too many small firms are not deploying advanced technology. They are not investing in training their workers and managers. And they are not reorganizing work to achieve higher quality.

It isn't that these small firms somehow cannot do it. Rather, most of them do not know quite what it is they have to do, and most of them do not know quite where to get the help to do it.

Our review of current policies and programs in New England is similar to reviews across the country. They are woefully inadequate to address these problems. New strategies are needed. The manufacturing modernization efforts now underway are small, fragmented, poorly coordinated, and they are unrelated to the private sector learning systems of supplier-customer relationships.

The only learning system that works for many of these firms is their relationship to their customers. It's the most powerful force for change in manufacturing modernization. Most will make major changes only when their customers demand it. They can't sense long-range technological and market trends very easily, but they can understand pretty quickly when their major customers threaten to cut back purchases.

Public-sector programs can be effective in helping to build a more sophisticated awareness of the competitive challenge that these small firms face. But our work suggests that to be effective, they must meet

three crucial tests: (1) these public policies must be comprehensive; (2) they must be carefully linked with the private sector-market relationships; and, (3) they must be regional in scope.

A regional approach would begin by confronting the major problems that small firms have. They lack the time and the skills and the patience to figure out where they need help, to learn what kind of help is available, and to arrange to use it efficiently and effectively.

In the formal statement which I provided, I summarize a number of strategies that can help small firms develop the capability to learn about the technology, the business practices, and the new marketing capability. I won't cover those again now.

Let me offer a few suggestions for Federal Government action and assistance. America's small- and medium-sized manufacturing firms are failing to adopt a technology to business practices and the human resource improvements required to compete at the higher end of the world market. We need a national strategy to help them do so.

Within that strategic framework, just two measures, neither one very expensive, could have enormous consequences. I think the first place to begin — the first strategic intervention — is with assistance to states and regional agencies in setting up a national network of industrial broker agents, like we have proposed in the New England region. Second, we need federal policies and programs and leadership in encouraging small companies to work together to learn from each other about what they need and where to get it.

By way of conclusion, two cautions. First, I would caution against special strategies that focus only on the problems of defense conversion. We do not have strategies in place to deal with overall issues of manufacturing competitiveness. I do not think it's wise to develop those strategies by focusing narrowly around one relatively small aspect — the defense market — of those larger changes.

A second caution is that I think federal strategies need to get beyond the current limited debate and preoccupation with the engineering aspects of manufacturing technology as the core of the modernization issue. It isn't. At its core, modernization is about learning. Our businesses have not been very good at it, and they do not have very effective mechanisms to help them.

The most immediate federal role should be to create ways for small- and medium-sized firms to learn, to learn from the specialized expertise already resident in the hundreds of programs and centers that are already out there, and new mechanisms to learn from each other. As I suggested, this means building an industrial extension system and promoting new forms of collaboration among businesses.

Thank you.

[The prepared statement of Mr. Bosworth follows:]

PREPARED STATEMENT OF BRIAN BOSWORTH

Thank you for the opportunity to testify today about my ideas regarding problems facing the manufacturing sector of New England and the need for new policies and programs to solve those problems. My statement today reflects my experience over the past several years of work and study about economic development generally and industrial modernization specifically. It further summarizes very recent work I have carried out under a contract with the Manufacturing Resource Center of Tufts University.

Dr. Leslie Schneider, Director of the Center at Tufts, and I have been exploring new strategies for helping small manufacturing firms and strengthening the manufacturing economy of New England. These efforts have underscored the importance of mounting an aggressive, regional, private sector-driven approach to manufacturing modernization. They have led us to develop a new proposal for examining in detail the feasibility of such an approach, including the establishment of a new, private sector-based organization to coordinate regional industrial modernization strategies.

The New England region faces a special problem as the nation contemplates a major reduction in defense spending. A 1989 Defense Department study concluded that 6.2 % of the goods and services produced in New England were defense-related, versus just 4.7% for the nation as a whole. On a per capita basis, Massachusetts and Connecticut have ranked 2nd and 3rd among the states on the dollar value of military prime contract spending. For example, from 1988 to 1990, between $12.5 and $15 billion were awarded annually in prime contracts to firms in just Massachusetts and Connecticut alone. The state of Massachusetts estimates that one in every fifteen workers there is directly dependent on defense spending. These numbers could only be about the same in Rhode Island and Connecticut and only slightly less in Maine, New Hampshire and Vermont.

Manufacturers in New England therefore face a double whammy. They are being challenged to compete in an international economy against far tougher standards of price, quality and dependability than they have faced domestically. At the same time, one of their largest customers -- the defense industry -- will probably cut back purchases by as much as 50% or even more over the next five to ten years. The smaller firms are not changing rapidly enough to cope successfully with these threats, and the mechanisms that

could help them – policies and programs that foster manufacturing modernization – are not in place.

The first section below summarizes some of the findings of this project to date. It points out that, while manufacturing is very important to the economy of this region, the manufacturing sector is in deep trouble. Because New England is a relatively high cost production region, its manufacturing firms must learn to compete at higher levels of value-added.

The regional manufacturing economy is increasingly made up of small firms whose flexibility and responsiveness could make them very competitive, but these firms are failing to modernize quickly enough to capitalize on these advantages. New England's small firms need help across several dimensions of technology, human resources, marketing, finance and business relationships. They need to incorporate total quality management into their performance to meet tough international standards. Without a strong supplier base of small firms, the larger ones will not prosper in New England and new ones will not locate here.

The second section summarizes our preliminary review of current policies and programs and concludes that they are woefully inadequate to address problems small manufacturers face. New strategies are needed urgently. Manufacturing modernization efforts currently underway are small, fragmented, poorly coordinated and unrelated to the private sector learning systems of supplier-customer relationships. If publicly-supported modernization programs are to be effective, they must be both comprehensive and regionally coordinated, they must meet the real needs of small companies and they must be integrated with the supplier standards and improvement efforts of the private companies. Because business relationships don't respect state boundaries, getting the private sector more deeply involved in guiding modernization assistance programs demands a regional approach. The businesses don't need redundant public programs and the states can't support them.

A regional approach would begin by confronting the major problems that small firms have – they lack the time, skills and patience to figure out where they need help, to learn what kind of help is available and to arrange to use it efficiently and effectively. Building on already in-place programs, a regional network of manufacturing "broker/agents," skilled across several dimensions of modernization, should be established to provide critical help to small firms in assessing problems and locating the best available external resources, public or private. Drawing from the quality standards of the large firms and their supplier requirements, the broker/agents would accelerate the learning of small firms. As the new extension system is put in place, new mechanisms to promote collaboration and joint problem-solving among small firms would be developed. New and specialized technology assistance and financing programs would be established as needed on a regional basis. An integrated regional response to looming cut-backs in defense spending would be developed. A system of performance benchmarking and assessment would

be developed by a consortium of larger private firms working jointly with their smaller customers. New electronic infrastructure would be put in place to speed the exchange of information and facilitate inter-firm cooperation throughout the region.

The third section of this document outlines the feasibility study workplan. I am including this with my statement in order to give the Committee a concrete example of the practical work required to examine and put in place new strategic mechanisms for manufacturing modernization. Our feasibility study will will examine the potential establishment of a new organization to guide the new initiatives. The project will investigate the feasibility of creating a "New England Alliance for Manufacturing Excellence," a non-profit, private corporation with an elected Board representing a large membership base of large and small manufacturing firms and other interested businesses from throughout the region. Each state could be represented on the Board of Directors. The Alliance might be self-supporting, through member dues, for purposes of staffing and administration, drawing on government and foundation grants to supplement private sector funds for the programs it would establish. The feasibility study will be competed by September 15, 1992 and presented for action to a steering group of private and public sector leaders organized during the study phase.

The final section of this statement offers a few suggestions for federal government action and assistance. The most important thing that the federal government can do is to understand the problem and its urgency. America's small and medium-sized manufacturing firms are failing to adopt the technology, business practices and human resources improvements required to compete at the higher end of the world market. We need a national strategy to help them do so. Within that strategic framework just two measures, neither one very expensive, could have enormous consequence. The first place to begin is with assistance to states and regional agencies in setting up a national network of industrial extension broker/agents like we have proposed for New England. Secondly, we need federal policies and leadership in encouraging small companies to work together, to learn from each other about what they need and where to get it.

I. THE PROBLEM

Manufacturing Matters in New England

Over the past 10-20 years, phrases like "post-industrial society" and "services economy" have crept into the public lexicon in a way that seems to suggest that manufacturing isn't really all that important anymore. For the U.S. in general and for New England in particular, decreases in the percent of employment in manufacturing, cutbacks in jobs at the large plants and the steady onslaught of foreign competition have fostered a myth that somehow a transition from manufacturing to services is inevitable and desirable, that

manufacturing should be left to other countries or at least to cheaper wage areas in the United States.

Nothing could be further from the truth. Manufacturing is just as important to the New England economy than it was twenty years ago. The proportion of regional total gross income represented by manufacturing has declined only very slightly from 1970 to 1990 and still represents close to one-quarter. In 1989 (the last year for which detailed reliable data is available) there were 25,630 manufacturing establishments in New England employing about 1.35 million workers -- 23% of all business establishment employment in the region. The annual payroll for these manufacturing firms was almost $40 billion -- 28% of all business establishment payroll in New England.

The average annual payroll per employee in manufacturing was about $28,650 versus, for example, $12,920 in the trade sector and $21,380 in services. Only in finance, insurance and real estate has the average payroll slightly exceeded that of manufacturing, and the deep and long regional recession in those sectors should give pause to any notion that these "post-industrial" services can support the regional economy.

While there has been relatively rapid growth in non-manufacturing, service jobs in New England over the past several years, it has been the value added by manufacturing that has made much of that job growth possible. And the manufacturing sector is the largest market for services. The high wage service jobs in such areas as design and engineering, payroll, inventory, accounting, software development and computer programming, plant and equipment repair, legal services, research and testing are all heavily dependent on the manufacturing base. Thus, while the total number of people employed in manufacturing has remained constant over the past several years, the increased value of manufacturing production and the wealth it creates has made possible much of the job growth in other sectors.

But, Manufacturing Is in Trouble in New England

The question facing New England is not whether the manufacturing sector will continue to be important -- it will. The question is only whether our industrial establishments will compete as low wage manufacturers or as high productivity, high wage producers. Competing at the low end of the market will bring a steady and devastating deterioration in the standard of living, not just for workers in the manufacturing sector but for all New Englanders. Competing at the high end of the market will mean higher value, higher wages and more wealth in New England. In fact, there is no real choice here. Relative to the rest of the U.S. and the rest of the industrialized world, New England is a high cost region. It can compete successfully only at the high end of the market.

Yet, New England's manufacturing base is in serious trouble. In the 1980s, manufacturing in New England grew at a slower rate than any other region in the United States. There was a sharp decline in employment and output in

several of the traditional industries such as textiles, rubber and plastics, apparel, and leather. However, New England also lost share in almost every area of durable goods manufacturing – fabricated metals, machinery, electrical equipment and transportation, including aircraft and shipbuilding. Perhaps most striking was the lose of regional share in the high growth, high tech areas thought to be at the core of the region's competitive advantage – electronics, missiles, computers, instruments, machine tools, and communications equipment.

In retrospect, many of these competitive problems should have been apparent in the 1980s. However, the fast pace of growth in construction, real estate, and banking masked the dangerous trends in manufacturing. But, as these paper growth industries collapsed at the end of the decade, the underlying problems of a deteriorating manufacturing base have been revealed.

The sharp reductions in defense spending pose special problems for the region. A 1989 Defense Department study concluded that 6.2 % of the goods and services produced in New England were defense-related, versus just 4.7% for the nation as a whole. The spending cuts will seriously affect a handful of large corporations in the region. They could have a disastrous effect on hundreds of small firms who are not prepared to move into new markets.

Some of New England's best companies, large and small, are well on their way to manufacturing excellence. In virtually every industrial sector, there are several New England firms able to compete at the leading edge of the most competitive markets. But, especially among smaller and medium-sized firms, common practice lags well behind best practice. This failure of small and medium-sized firms to modernize their technology and business practices in order to compete at higher levels of value-added in international manufacturing markets has become the most serious problem facing the New England economy.

New England's Small Manufacturing Companies Have Special Needs

The larger plants in New England are far less dependent on external resources for help. Many are branch establishments of large, multi-national corporations that have access to substantial financial, technical and managerial resources. New England must continue to offer its larger plants a competitive, pro-business environment and a quality-oriented education and training system. However, we should focus our economic development efforts on the special needs of the smaller, home-based firms.

In 1989, only 377 of New England's 25,600 manufacturing establishments employed more than 500 employees and fewer than 1,000 firms employed over 250 workers. Most of the firms are very small; 91% employed less than 100 and 81% had less than 50 workers.

As the international manufacturing economy has restructured over the past ten years, these small manufacturing firms have become more important to

New England. One of the chief consequences of fundamental change in the world economy is the growth of small manufacturers relative to larger ones. In virtually all manufacturing sectors, small establishments have increased their share of total establishments, total employment and total value of production. That is especially true here in New England. During the 20 years from 1969 to 1989, employment in plants with over 250 workers decreased by 26%, but employment in shops of less than 50 workers actually increased by 10%. And the number of these small shops grew dramatically by 17% during this same period.

Markets for manufactured goods are highly segmented, extremely volatile and international in scope. They require customized products that meet exacting standards of performance and dependability. The primary focus of competition has shifted from cost to quality. While New England manufacturers can no longer depend on traditional markets, the demand for high value-added industrial products remain strong. Firms that can manage the transition to higher skills and higher technology can do well in these new, niche markets.

Smaller organizations, at the firm level and the establishment level, may often have a decided advantage over big ones. They can be more agile, more immediately able to respond to market or technology shifts, more "nimble" in spotting emerging market niches, more flexible in rapidly shifting production to meet new opportunities. However, smaller firms can also lack the "sensing mechanisms" of larger ones. For example, their small scale will normally preclude the maintenance of worldwide marketing and distribution systems that have enabled larger firms to spot market shifts rapidly. Small firms will also face difficulties in learning about technological change.

In New England, as in the rest of the U.S., it is in this small manufacturing sector that the performance gap between the best firms and the average is widest. Many of the larger manufacturers have made important strides in modernizing their plant and equipment, up-grading the skills of their workers and instituting new approaches to manufacturing quality. For the large companies these gains have come slowly and at enormous cost. But most small firms are not making the transition. All the available evidence suggests that too many small firms are not deploying advanced technology, they are not investing in training their workers and managers, and they are not reorganizing work to achieve higher quality.

It isn't that these small firms somehow just "can't do it." Rather, many of them don't know what it is that they have to do and most of them don't know where to get the help to do it.

For the Small Firm, Modernization Requires Simultaneous Change Across Several Dimensions

Manufacturing modernization is not just a problem of technology or engineering. Gaining the ability to compete at progressively higher value

added levels in the international manufacturing economy involves simultaneous change and improvement across five principal dimensions -- technology, markets, human resources, finance and relationships with other companies. For many companies, integrating these simultaneous changes requires that they adopt a set of business practices so new and so different as to constitute a new management paradigm.

Managing Technology

Producing higher value added goods that can meet international standards for quality, precision, reliability and delivery frequently requires the application of advanced technology to the production process. This means the appropriate utilization of new materials and sophisticated processes, machines and systems for design and engineering, materials and requirements planning, fabrication and assembly, materials handling and inventory management, inspection and testing, and communication and control. Very frequently, these sophisticated processes, machines and systems incorporate or otherwise require computers and micro-electronic controls for programmable and re-programmable automation.

Managing Markets

Few small manufacturing companies have the experience or skills in market research, analysis and planning required by the changing context of competition. Most of these small firms have been production-oriented rather than market-oriented. Many have been making one or just a few relatively standardized products and selling them to one or just a few customers. But making a broader range of customized goods with higher value added and selling them into a volatile, niche-oriented international market requires a sophisticated ability to understand market trends. The managers of small firms need better information and tools for market research, analysis and planning and they need technical assistance and training in developing the skills to use them.

Managing Human Resources

Small manufacturing firms in New England using new production technology will need to develop new occupational, technical and problem-solving skills for managers, office support staff and front line production workers. The challenge is more than simply instructing employees in the performance of new tasks, although that itself can be a huge undertaking.

A customer/market orientation, a commitment to quality and the effective utilization of advanced production technologies demand technical skills which almost always have a theoretical as well as a practical dimension. Mastering that theoretical dimension frequently requires the employees (and managers) to gain stronger basic math and language skills as a prerequisite to practical training. In addition, employees need a wide range of critical thinking skills to be flexible and pro-active in meeting problems and

opportunities associated with changes in production technology, product mix and customer requirements.

Moreover, small manufacturers throughout New England are finding that instilling the commitment to quality demanded by the marketplace and using the new production technology requires that employees at all levels take more responsibility for planning and problem-solving. This usually involves re-organizing work and assigning responsibilities in new and different ways. Small firms need a lot of help with that process.

Managing Finances

Exploring new market opportunities, acquiring advanced manufacturing technologies and investing in training and new forms of work organization require capital. Many small manufacturers have been subject to sharp fluctuations in demand from their principal customers and, often, avoiding debt and keeping fixed costs to a minimum has seemed the most prudent business strategy. Over the long term, however, the firms must learn to finance modernization.

Even beyond the current trough in the economy, small manufacturing companies in New England face some severe problems of access to credit. The traditional sources of financing are banks, many of which are facing severe capital constraints. Some banks have been calling loans to good customers who have never missed a payment, Moreover, some are increasingly resistant to making small loans and most often are not familiar with new manufacturing technologies and other requirements of modernization. There are few specialized private lending or equity financing institutions which can meet some of the non-conventional financing needs of small manufacturers. The state governments subsidized lending authorities are not seen by the small companies as meeting their needs in terms of either volume or responsiveness. These small companies need better advice and assistance in considering their options and devising long-term strategies to finance their capital needs.

Managing Business Relationships

Meeting the demands of market, technology, human resources and finance will require that the small manufacturers get better at managing their relationships with other businesses. This means working in vertical relationships to diversify away from over-dependence on just a few customers or to enter into more secure long-term supply relationships that will facilitate the capital investments and financing required for modernization.

Forming horizontal relationships with similar or complementary firms is also becoming important. Collaborative relationships among these small firms are essential to begin to create "learning systems" so that the firms may learn from each other. In many cases, small firms can band together to

achieve scale in confronting common problems of materials acquisition, market planning, training and even financing. These companies can share specialized equipment and technological capabilities, exchange experiences and informally sub-contract work to one another. Small firms can begin to explore the complementary production networks that have emerged in other countries and other parts of the U.S. Given the small scale of manufacturing firms in New England, such horizontal clustering looks to be essential to the modernization process.

In addition to the immense challenge of trying to stay competitive by managing change in all the modernization dimensions discussed above, the owner/managers of most small manufacturing companies face enormous day-to-day problems just coping with the same general business pressures confronting all small firms that work close to the margin. It just isn't possible to pursue the complex agenda of manufacturing modernization if dealing with the day-to-day burdens crowds out the time to address longer range objectives. Pursuing that modernization agenda frequently requires fundamental shifts in the way the owner/manager, the mid-level supervisors and the front line workers think about their work, the way they work together and the way they interact with their market.

II. NEW STRATEGIES

In the search for solutions to the challenge of manufacturing excellence in small firms, the new New England states must be both innovative and flexible. The 25,000 small manufacturers in New England will need a lot of help to survive the competitive pressures of the next several years. Large companies will not survive here and new companies will not locate here if there is not a strong small firm supplier base.

New England is the highest cost manufacturing region in the United States and among the highest cost of any region in the world. While the state governments need to try to rein in further increases, it is not realistic to seek greater competitiveness through reductions in the cost of doing business. The cost of real estate and housing, health care, education and training, power, communications and business services are not likely to decrease. The only way for manufacturing in this region is to get a leg up on its competition is to move more quickly to higher value-added production and to develop the new infrastructure that will support it.

New England needs to develop a new system for assuring that small firms get the help they need in moving faster toward higher value-added production. That new system should be regional in its scope and private sector-driven in its leadership.

Current Programs are Fragmented and Inadequate

The work already carried out under this project suggests that current state-by-state efforts to assist small manufacturers just aren't working. First, most economic development spending in the region is not even aimed at assisting small manufacturing companies. Most of it is still focused on real estate oriented projects that have only marginal impact on manufacturing. Even many existing business assistance efforts are not targeted at manufacturing or don't deal with issues affecting the competitiveness of small firms.

Secondly, while every state in New England has a few programs for industrial modernization, they are very small, highly fragmented, and often not well targeted. They are poorly coordinated within each state and not at all coordinated across state lines. The larger programs are not very sharply focused on higher value-added manufacturing. The most innovative and promising of the existing efforts tend to be carried out only on a very small scale. They can't ramp up to the level necessary to make a real difference. Some of these programs are helping a few companies, but, as a group, they are having little impact on meeting the needs of most small companies.

Thirdly, most of these existing programs are not dealing with manufacturing modernization as a multi-dimensional issue requiring simultaneous change and assistance in many different aspects of the business. Too frequently, business finance programs are unrelated to other efforts. Training is provided in isolation from the rest of the modernization agenda. Assistance in adapting advanced manufacturing technologies, when it is available, is usually provided by engineering assistance programs unconnected with the rest of the business development system.

Fourthly, judging from the several group meetings with owner/operators conducted during this project, the public sector development efforts just don't get a lot of respect among their small firm clients. Many of the firms tend to see government as part of the problem; they have a hard time viewing government programs as part of the solution. Most small manufacturing firms are not accustomed to working with public programs to resolve the problems of manufacturing modernization. Traditional, university-based programs emphasizing applied research may have been important to a few of the larger companies in the region, but they have limited if any relevance to the small firms. Moreover, university-based technical assistance is often available only from individuals who have little or no manufacturing experience. Financing efforts are seen as bureaucratic and cumbersome.

Finally, and very importantly, much of the problem of manufacturing modernization is on the demand side and has little to do with the availability of public sector programs. The owners and managers of small companies often don't know what help they need, they don't know what is available, and they have no sense of how to arrange to get it it. Faced with the press of daily demands, the owners and managers of small firms just don't have the time, skills or patience to track down the help the need for the solution of

long-range problems. They have a very hard time using the private sector system of technology vendors, engineering services, marketing experts, and quality systems consultants. The complex array of publicly supported government and university programs is almost indecipherable. Demand for modernization assistance from the firms themselves is muted, vague and not sharply articulated.

The only learning system that works for many of these firms is their relationship to their customers. This supplier-customer link is the most powerful force for change in manufacturing modernization. Analysis of small firm behavior suggests that most will make major changes only when their customers demand those changes. They can't easily sense long-range technological and market trends, but they can understand very quickly when their major customers threaten to cut back purchases because their quality doesn't measure up to tougher new standards. Most of the larger companies in the region have developed new and demanding performance standards for their suppliers, but few have been prepared to lend significant help to the smaller companies as they strive to meet those standards.

Public sector programs can be effective in helping to build a more sophisticated awareness of the competitive challenges facing small manufacturers in New England and in meeting some of their assistance needs. However, this study suggests that to be effective they must begin to meet three crucial tests. They must be comprehensive, carefully linked with the private sector market relationships and regional in scope.

A Regional Approach is Necessary and the Private Sector Must Lead It

The manufacturing economies of the New England states are too intertwined for effective state-by-state approaches. Business relationships don't respect state boundaries. The major corporations and large original equipment manufacturers (OEMs) draw on a supplier base that is regional, not state. Any approach to helping the small firms gain the ability to compete at higher levels of value-added in the national and international economy will require the full involvement of their larger customers and other major enterprises who have a vested interest in the strength and vitality of the small manufacturing base. Getting the major manufacturing firms involved in helping to design and carry out a new approach to modernizing the small firm base requires a regional approach. These firms won't support overlapping, duplicative and redundant state-by-state efforts. Further, the banks, insurance companies and utilities who depend on a strong manufacturing economy for their customer base are themselves increasingly regional in the scope of their interest. They are concerned with the competitive position of the entire region, not just individual states.

The direct involvement of these private sector firms in a regional approach to manufacturing modernization is crucial to the economic prosperity of New England. The smaller firms need the leadership, example and motivation that the larger firms can supply and the small firms can help each other.

Some of New England's small companies are well on their way to manufacturing excellence. In virtually every industrial sector, there are several firms in the region who are competing at the leading edge of the most competitive markets in the world. It's time to get these best practice firms involved in leading a regional modernization effort

Notwithstanding the weaknesses noted above, the New England region, taken as a whole, has tremendous resources, both public and private, that, if harnessed into a single, coordinated system, could have a powerful impact in modernizing the small manufacturing base. There are several advanced technology development and demonstration facilities at higher education institutions and engineering technical assistance is available from several colleges and universities. There are scores of local economic development organizations throughout the region who with training can provide valuable assistance to the small firms. There are specialized marketing resources available from Small Business Development Centers, state economic development agencies, and the colleges and universities. New England's technical training capability at vocational institutions and higher educational establishments is among the finest in the U.S.. Several public specialized financing agencies have the capacity to help small manufacturers with financial planning and finding investment and operating capital. The private sector, including banks, accountants and utilities as well as independent consulting firms, has a wide array of expertise. The private business service sector in New England may be the among the greatest concentrations of such expertise in the world.

However, these resources are not being harnessed effectively in support of the manufacturing foundation in the region. As noted above, many of these programs are not targeted at small manufacturing firms; they are very small, both as a percentage of total economic development efforts and in comparison to the efforts being launched in several other parts of the United States; and they are fragmented within the states with no effort at cooperation across state lines. But, the major problem right now is that most of these programs are unconnected with the small firms and the private sector, market-oriented learning systems on which they depend.

A Regional Industrial Extension Service Should be Developed

The "starting point" -- the first essential strategic intervention in formulating a new approach -- is to establish a comprehensive, regionally coordinated, manufacturing modernization extension system, a network of "broker/agents" who would link small firms with the specialized assistance they need and help them to understand why, when and how to use it.

Small manufacturing firms need a delivery interface that is decentralized and local. They need it to be user-friendly -- to extend to meet their needs and their constraints. They need it to be closely linked to their best customers, to reflect the priorities and demands of the leading major manufacturers and original equipment manufacturers in the region.

There have to be enough of these broker/agents in the field to work at the scale of the problem. That probably means a network of about 150 to 175 highly skilled field agents who can work closely with the companies in their regions or "territories," pro-actively helping them figure out what they must do to become more competitive at higher levels of value added and brokering for them the help they need. The broker/agents would also assist small firms to establish cooperative networks to seek joint solutions to common problems and pursue complementary production and marketing strategies. This group of extension agents would give the small firms what they have the least -- time, skills and patience to analyze long-term issues of modernization, learn from each other and find the external resources to help.

This network of broker/agents would be carefully linked with the supplier requirements and certification standards of the larger manufacturing firms. They should be an extension of these large firms in helping small companies understand what it is going to take to develop the quality standards demanded by the marketplace. The broker/agents could help these large companies realize several efficiencies in working with their current and prospective small firm supplier base.

The broker/agents should have strong knowledge and skills across all the dimensions of modernization. They should have a background in industrial engineering or business administration and work experience in a manufacturing environment. The field network would need a lot of on-going training and much of that training should come from the large firms. It is also crucial that this field network be supported by careful research and analysis of key trends in the manufacturing sectors.

In most of the New England states, there already exists some modest efforts that approximate this extension model. This new extension system need not duplicate or parallel these in-place programs even if, as observed earlier, current efforts are woefully inadequate. Economic development, training and education agencies at state and local levels are already spending a lot of money to support existing businesses. The resources are there, they are just not well targeted to the real needs of small manufacturing companies. If presented with a "logical system" and some financial assistance or incentive, the state and local institutions involved in economic development should be prepared to re-allocate these resources into more more targeted, dedicated and regionally coordinated network. It is not necessary to create a whole new set of economic development specialists, but it is necessary to re-deploy, re-focus, train and substantially add to those that are already there.

The strategy here, therefore, is to design and implement a practical approach to reorganizing some of the existing economic development resources of the six New England states into an integrated, regional network of manufacturing modernization extension agents. Specifically, existing extension efforts need to be strengthened and a much larger share of general purpose economic development resources has to be re-allocated into this critical area. That

doesn't mean that state and local authorities would have to actually put their resources into a "regional pot," but it does mean that they would agree to re-think their priorities and re-organize into a more coordinated regional approach. The "trick" is to figure out what mix of carrot and stick will induce this kind of cooperation. Strong and aggressive private sector leadership will be an essential first step.

Other Critical Programs Could Be Established on a Regional Basis

As this network of field agents is put in place and strengthened, several other key strategies can be initiated. First, for example, a major early initiative would be to build new collaborative mechanisms in New England so that small firms may learn quicker and better from each other. Even with a large, aggressive and well-trained extension network in place, traditional efforts to help firms one-by-one simply will not be enough. Long experience in other nations and recent experiments in the United States demonstrate that small firms, working cooperatively in clusters, can accelerate the process of modernization by forging joint solutions to common problems and by joining their specialized capability in new ways for complementary production. This initiative might involve cooperative activities to strengthen trade associations and specific industry groups in the region. It might also include new efforts to foster flexible manufacturing networks of the sort that have emerged in Europe and are being encouraged in other parts of the United States. A major regional effort in building these collaborative mechanisms that would encourage this inter-firm cooperation among small manufacturers could have relatively high and quick payback.

Secondly, as new specialized technology resources are needed, they could be designed and established on a regional basis. For example, the New England states working together could develop a highly competitive proposal for federal assistance through the Manufacturing Technology Centers program of the National Institute for Standards and Technology (NIST). NIST plans to establish a national network of these regional centers (there are now five in place with two more to be funded in 1992), each serving an area of several thousand small and medium-sized manufacturing companies. NIST is committing about $13 million to each of these centers and requiring another $20 million in matching financing. The compact economic region of New England should have a special advantage in competing for such funding if a regional framework can be put together and six states working together should be able to produce the matching support needed.

Thirdly, and of special importance for many small firms, would be the development of a coordinated regional strategy for dealing with the consequence of cut backs in defense related manufacturing in New England. It should be possible to leverage federal funds from such organizations as the Office of Economic Adjustment of the Department of Defense for a regionally developed program to help the small firms find new markets not dependent on defense spending.

Fourthly, if there is evidence that new modernization financing strategies are needed, this regional approach offers the best potential for coming up with an effective program. Commercial banking is a regional industry in New England and publicly-subsidized development finance initiatives can be far more powerful if they work cooperatively within that regional banking system.

Fifthly, a regional effort could establish a manufacturing performance benchmarking system to help small firms understand their competitive position. Small firms who are aware in general of the competitive challenge they face often don't know specifically how they measure up against their competition. A regionally organized performance benchmarking and assessment approach could help these firms learn where they stand against tough standards of global competition and where they need to get better. Such a system might be tied to such widely recognized standards as ISO 9000 and it might incorporate key elements from the supplier certification standards of many the large manufacturing firms in the region.

Finally, yet another initiative might involve the establishment of new electronic communications infrastructure that will promote inter-firm cooperation among manufacturers in the region by creating a regional industrial data base of products, facilities and services and facilitating the exchange of complex information.

Is It Feasible to Establish a New England Alliance for Manufacturing Excellence?

There does not appear to be an existing regional organization which can guide these new approaches to industrial modernization. At this point, it looks like a new organization ought to be created having several critical attributes:

- it would include representation from each of the states;
- it would be focused directly and exclusively on modernization needs of small firms in the manufacturing sector;
- it would have the clout of high level, private sector leadership;
- it would have the direct and long-term participation of large and small manufacturers as well as other businesses with a vested interest in the strength of the manufacturing base;
- it would be held accountable for establishing better systems to help small manufacturing firms in New England gain the ability to compete at higher levels of value-added production;
- it would include high level public sector leadership from each state and, ideally, be in a position to attract state funding for non-overhead related program activities;

- it would be able to attract as "seed funding" grant support from foundations as well as from the federal government; and,

- it would have a mechanism for becoming self-sustaining, (i.e., participating businesses should finance its annual operating cost).

Based on the pre-feasibility reconnaissance carried out through this project to date, it may be appropriate to establish the "New England Alliance for Manufacturing Excellence" as a membership-based, non-profit corporation with a public-private leadership board. An Alliance could be based on three classes of dues-paying membership, consisting of (1) the small firms themselves (especially the "best practice" ones) who would pay a modest level of annual dues and elect several representatives to the Board of Directors; (2) the larger manufacturers and other businesses like utilities, banks and service firms selling to small manufacturers who would form a second category of membership, pay a higher level of annual dues and also elect representatives to the Board; and, (3) the Governor's Office of each state also might appoint a representative to the Board of the Alliance.

The private sector dues could be structured to provide all the funding necessary for the staffing and other administrative costs of the Alliance. Foundation and federal government grants and special contributions from the states would be used to supplement private sector funds for the programs established by the Alliance.

The Alliance would not need a large staff. **The idea is not to start just another new program, but rather to build a regional system out of the programs that are in place now.** The Alliance would require only a lean staff, drawing heavily on the experience of the participating private firms and key state and sub-state economic development organizations. It would work closely with that private and public industrial modernization infrastructure in each of the states in strengthening and coordinating existing programs, developing an integrated regional extension network and initiating some of the other programs outlined above.

III. The Feasibility Study Work Plan

The feasibility study work plan consists of five major elements to be carried out over a four month period beginning on or about June 1, 1992. These elements are as follows:

- continued needs assessment; that is, analysis of the most important modernization problems facing small firms in New England;

- an assessment of the feasibility of integrating the public sector industrial modernization programs into a regional approach;

- an analysis of the problems and opportunities of private sector participation in a regional industrial modernization program;
- a workshop to present findings and develop a consensus about specific program and organization approaches; and,
- an action plan for establishing the organization and implementing the program initiatives.

Part One -- Continuing the Needs Assessment

The assessment of modernization needs of small manufacturing firms in New England is already well underway through the preliminary reconnaissance phase of this project. Focus group meetings have been held with several owner/managers of small firms and most of the necessary research into trends of regional change in manufacturing structure and performance has been completed. However, further investigation and continued discussion with the small firm sector will be necessary to develop a still sharper understanding of their views about accessing publicly supported programs of modernization assistance. In addition, it will be important to determine the specific opportunities for closer involvement with sector-based trade associations and industry groups. Finally, further work in this area will be necessary to identify the key determinants of the extent to which small firms themselves would help to support a regional industrial modernization initiative.

Part Two -- Assessing The Public Sector Involvement

Again, some work in assessing the interest of state and local government officials in a regional effort of manufacturing modernization has already been carried out. Here, however, much more careful, extensive and systematic work is essential. State-based programs probably will support a regional effort only to the extent that the regional program is viewed as strengthening them, not replacing or competing for funds with their current efforts and their future plans.

The objective of this regional initiative is to build on the existing economic development and industrial modernization infrastructure. This requires a clear understanding of the structure, level of effort and focus of the existing programs. This work element therefore will include an inventory of the key programs in the region and identification of and much subsequent discussion with the program managers. Of specific concern will be their assessment of the opportunities and limits of regional approaches to coordinating work they already have underway and the likelihood of re-allocating a larger share of economic development resources into a targeted program of manufacturing modernization.

Part Three -- Measuring the Potential for Private Sector Leadership

Only a handful of firms were contacted during the reconnaissance phase of this project, and while their response was encouraging, a great deal more work remains to be done in meeting with the private companies who would have to provide leadership on this project. These include five groups. First, there are probably five or six large regional banks in New England who ought to have the depth of concern about the manufacturing base of the region to warrant sponsorship of this initiative. Secondly, there are eight or ten large insurance companies headquartered in New England with a huge financial stake in the underlying competitiveness of the manufacturing sector. Thirdly, the largest six or seven utilities in the region depend upon the manufacturing sector for a major share of their market for power and communications and are already involved in economic development programs. Fourth, a significant number of leading practice small firms need to get involved in helping to shape the modernization agenda for the region. Finally, of course, there are the regionally-headquartered large manufacturing corporations with hundreds of plants and thousands of suppliers throughout New England. While these multi-national corporations have facilities all over the world, they live here, they have an enormous investment in the region and they need a stronger base of suppliers and small firms.

Meetings with these firms will address three key questions. First, do they agree that regional competitiveness is tied to the ability of small firms to modernize and what do they see as the key elements of that process? Secondly, what specific opportunities do they see for a public-private partnership in helping these small firms? Thirdly, would they be willing to help finance a regional effort to accelerate the modernization process and what would be the key conditions and limits of their potential financing?

Part Four -- Developing a Consensus for Action

In mid to late September 1992, a regional meeting will be held of a Steering Committee to review the feasibility study and come to a consensus about further action to establish the New England Alliance for Manufacturing Excellence. The precise composition of the Steering Group will be determined during the course of the feasibility assessment and the interviews with key private and public sector leaders. Ideally, the group that will convene in September to review the proposal would consist of all the people whose participation would be necessary to launch the new initiative.

Part Five -- Developing an Implementation Plan

The final component of the project will be the development of a plan and timetable for implementation. Much of this work would be completed before the regional meeting in order to give the participants a clear view of major program and organization issues and how to resolve them. The implementation plan will include an organization and staffing plan for the

proposed Alliance, a membership strategy, a tentative budget and financing strategy and a program development schedule.

The Project Team

The feasibility study will be carried out by Leslie Schneider, Director of the Manufacturing Resources Center (MRC) at Tufts University in Medford, Massachusetts, and Brian Bosworth of Providence, Rhode Island, consultant to the Center. Schneider and Bosworth will serve as co-directors of the project. They will be assisted by the firm of WSY Consulting Group, Inc., a market research and strategic planning company headquartered in Greenwich Connecticut. Schneider and Bosworth will work on all of the five principle parts of the work plan. WSY Consulting Group will focus primarily on identifying key private sector participants as discussed in part three of the work plan and on helping to plan and develop the regional consensus building meeting outlined in part four.

IV. New Federal Government Policies and Programs

Getting small and medium firms to adopt the technologies, business practices and human resource policies enabling them to compete at higher levels of value-added will be a long-haul process, and public policies can help only at the margins. However, at those margins, what government does can make a real difference.

I would caution against special strategies that focus only on the problems of defense conversion. We don't have effective strategies in place to deal with the over-all issues of manufacturing competitiveness in face of fundamental changes in the market for manufactured goods. And I don't think it's wise to develop those strategies by focusing narrowly around one relatively small aspect -- the defense market -- of those larger changes.

My work over the last several years suggests to me that the federal government must be an important player in the larger issues. However, effective federal strategies need to get beyond the limited debate about industrial policy and overcome a preoccupation with the engineering aspects of manufacturing technology as the core of the modernization issue. It isn't. Modernization at its core is about learning. Our businesses have not been very good at it and they don't have very effective mechanisms to help them.

I believe therefore that the most immediate federal role should be to create ways for small and medium sized firms to learn -- to learn from the specialized expertise resident in the hundreds of programs and "centers" that are already out there and to learn from each other. This means building an industrial extension system and promoting new forms of collaboration.

Building an Industrial Extension System

The natural tendency of government when faced with a problem like that of manufacturing modernization is to create a new program. But we have plenty of programs now. What we need is to build them into a system.

The problem is not so much in the supply of assistance programs as in their connection to the small firms. On almost every occasion where small firms are asked to evaluate federal, state or local government delivered or subsidized programs, the vast majority respond that they just don't know about the programs. Small firm owner/managers have little time, fewer skills and almost no patience when it comes to "accessing" the array of publicly supported programs that are out there. Merely increasing the supply of those programs does them little good.

Moreover, while the small firm owners/managers may have a vague and uneasy sense that what they are doing today won't be good enough for tomorrow, they aren't good at reading changes in the market and at sensing problems and anticipating remedies. These firms need a lot of "hands on" help in looking beyond today's problems to develop a vision of what they need to do over the long haul.

Therefore, the first key element of federal strategy should be to make sure that each state has a system that links small firms with the specialized help they need and that helps them to understand what, when and how to use it. This should be a locally-based network of broadly skilled, field agents who can work closely with the companies in their regions or "territories," proactively helping them figure out what they must do to become more competitive at higher levels of value added and brokering for them the help they need. They would be seen as the modernization agents of the small companies themselves rather than as agents for the providers of specialized services. They would help their companies to look beyond short-term, day-to-day business hassles to longer-term strategies. They would do some on-the-spot trouble shooting, but their primary task would be to help the firms understand, organize and articulate their modernization needs. They would promote networks of small firms organized for mutual self-help and shared learning. That field network would need a lot of on-going training to develop their knowledge and skills and it's crucial that it be supported by careful research and analysis of key trends in the manufacturing sectors.

This extension system should not merely duplicate and parallel already in-place economic development resources. There is no need for a separate system and certainly no money to finance one. Many regional training, education and economic development agencies are already concerned with the needs of small manufacturers. They are already allocating resources to help them and, if presented with a "logical system" and some financial assistance, they are prepared to re-allocate these resources. The strategy should be to help states offer a workable approach to re-deploying some of the existing regional economic development resources into an integrated

network of manufacturing modernization agents who will work on behalf of the small manufacturing firms.

Small firm owners and managers should have the primary responsibility for oversight of this extension system. "Putting the customers in charge" means giving them the authority to establish priorities and evaluate results and it means asking them gradually to share responsibility for financing the management and coordination of the system.

The extension system should give the small manufacturers a set of performance standards toward which they can strive. For many small firms, a recognized set of modernization benchmarks could be a valuable planning tool. Larger companies who may be expected to gain from the improvement of their small firm supplier base could play a role in the development of these standards. Performance standards would help clarify what the extension agents should know and be able to do and will help guide the programs of the specialized expert resources

Converting these strategic elements into the design of an "ideal" industrial extension system would result in a delivery system most easily understood as being divided into three components. The first component would consist of the field network of broker/agents for "hands-on" interface with the small and medium sized companies.

The second component would be a small group of industry sector specialists, focused on specific industrial groups or markets and analyzing key industry trends. Working at the state level, these industry sector specialists would track market and technology changes affecting the industries most important to the state, channelling that intelligence through the broker/agents to the small firms.

The third component of the system would consist of all the services that might be termed "specialized, expert resources or capability" (in private companies as well as educational institutions and public agencies), such as advanced manufacturing technology demonstration and technical assistance, engineering assistance, special financing programs, training centers and marketing experts and business planners who are available to work with specific firms or clusters of firms. These resources are present to varying degrees in every state. In the short-term, the extension system need not contemplate major new investments to create or expand these specialized, expert resources. Initial emphasis should be on inventorying, categorizing, coordinating and aggressively marketing through the broker/agent network what is already available. As specific needs and gaps are uncovered, some new investments might become appropriate and some federal funds should be available to assist in strengthening these specialized, expert service programs.

Promoting Collaboration

My thesis here is that we need to be less concerned about the supply of public sector programs aimed at helping companies and more concerned about strengthening the private sector infrastructure that helps firms learn, from each other, about what they need and how to get it.

The most important issues involved in the international competitiveness of U.S. industry tend to be on the demand side. Conventional economic development practice has been inordinately concerned with creating more and more programs to provide assistance to help businesses grow or become more competitive. But the issues of growth and competitiveness have less to do with the supply or availability of public business assistance programs than with the desire of most firms, especially the small and medium-sized ones, to adopt competitive technologies, practices and policies. The first and most important threshold for the vast majority of small and medium-sized American manufacturing firms has to do with their vision of what it will take to be competitive, their sense of how to do it, their confidence in undertaking essential improvements and their commitment to see it through. The most powerful way for firms to develop this vision, confidence and committment is to learn it from each other.

Collaboration among small and medium-sized firms and between them and their larger customers has enormous potential to achieve important economies; to create new and more powerful development, production and marketing networks; and to accelerate learning among firms of all sizes, most especially smaller ones. Providing modernization services to clusters of firms is much more efficient that attempting to help them solve problems on a one by one basis. However, promoting collaborative arrangements among firms is more than just a matter of efficiency. Internationally competitive manufacturing firms must get very good at working with other firms in horizontal and vertical relationships. Establishing and maintaining collaborative mechanisms is essential for small firms to be successful in international competition.

The private sector infrastructure that can promote collaboration is quite poorly developed in the United States, at least relative to other industrialized nations. Businesses here spend far less time in cooperative work with other each other than do businesses in other nations. Trade associations and industry groups are weak and underdeveloped relative to other nations, especially at the regional or local level. This severely restricts the opportunity for firms to develop the skills of consortial behavior, of working together; it keeps them surprisingly ignorant about their competitive position as a firm, as a regional cluster or as an industrial sector; and, it retards the development of mutual trust and confidence that must be at the base of complementary marketing and production.

One reason for the relatively low level of consortial behavior in American industry is our anti-trust legislation. It has had a chilling effect on

cooperative behavior among firms. Many businesses and the general purpose attorneys that advise them wrongly believe it illegal in this country to get together with other firms with a view toward talking about joint marketing arrangements or even shared use of specialized technology. Attorneys specializing in anti-trust agree that the kind of cooperative behavior exemplified by the flexible manufacturing networks that are widespread in Europe and that are beginning to develop here are in no way proscribed by current anti-trust law and enforcement doctrine. But the strong anti-trust tradition in America has contributed to a business/legal culture that does not look favorably on any kind of cooperation. The law sends a signal to the business community that cooperation is wrong. This signal tends not to differentiate between the large firms who do have the capacity to allocate markets and influence prices and the small firms who have no such capacity. Generally, cooperation on specific activities related to markets, shared production or joint technology applications has been seen as unethical if not downright illegal. And while these attitudes are changing in responds to competitive pressures, they are changing very slowly. Many state or regionally organized trade associations believe -- incorrectly -- that their freedom to help member organize for purposes of meeting common needs or responding to common market opportunities is severely limited by anti-trust law.

Further, the particular culture of entrepreneurship in America seems to discourage firm owners from getting together with each other, at least for the purpose of talking about business. Many small business owners choose to see themselves as "ruggedly individualistic", and act almost as though they were seeking to conform to their stereotype.

Perhaps the sharpest reason for the strikingly different patterns of associative behavior between firms in America and those in other industrialized nations is the relative emphasis on international versus domestic competition. Small and medium-sized manufacturing companies in European and Asian nations have for a long time seen themselves as competing on an international scale. In the U.S., the field of competition has shifted from local to global only very recently for most companies, and some have yet to see or understand that shift. The huge size of America's domestic market acted for years to shield American manufacturing companies from international competition and that has had a lot to do with the emergence of collaborative institutions in America. If you see your competition as local, it's hard to establish arenas of cooperation with similar firms in your own region. It is a lot easier to cooperate locally if you see your competition as international.

Moreover, if your company and others in your region still compete in relatively undifferentiated markets with relatively standard products, you probably are a lot less inclined to cooperate with these other nearby companies. But if your firm and most others in your region have become increasingly specialized in highly segmented market niches with very customized products, it is much easier for you to look to new forms of collaboration locally so that you may better compete globally.

As firms move "up-market," they tend to specialize. As they add greater value to more customized products through the application of higher technology and higher skills, firms gradually discover that their real competition is not down the street, but rather across the ocean. Thus the process of modernization itself provides the opportunity for greater cooperation with other local firms in the same sector. However, these changes in the locus of competition have come very quickly to small manufacturers in America. The institutional mechanisms that could promote cooperation and foster collective learning haven't been there.

New federal policies could begin with a review of anti-trust laws to find a way to signal small firms and their associations that their government encourages collaboration. Government assistance programs and technology transfer efforts could provide incentives for collaborative programs among small firms. Special efforts could be aimed at helping trade associations and industry groups learn to provide direct services to their members. Larger firms could be given incentives to work more closely with small ones on joint training, cooperative research and development and new market identification.

SENATOR SARBANES. Thank you very much, sir.

Let me pick up on the last point that you made. My impression is that both Japan and Germany have a much more extensive system to address this problem.

Is that correct?

MR. BOSWORTH. Yes. Several European nations and several nations in the Pacific Rim–most notably, the two you mentioned–have well-developed national programs of assistance to small firms, particularly helping them learn about where they can obtain the specialized expertise.

There is also an industrial structure in those countries which permits far greater learning from each other than is characteristic of the sort of atomized structure of U.S. industrial establishments.

SENATOR SARBANES. You place a significant importance on antitrust policy with respect to that last question.

Is that correct?

MR. BOSWORTH. As I observed in the written statement, I think antitrust has had a chilling effect on the willingness of small firms to talk to each other and on the emergence of mechanisms that would allow small firms to learn from each other.

I think one place that the Federal Government can begin is with a re-examination of the consequences of antitrust legislation that is aimed at preventing collusion among large firms and its consequence on stifling collaboration among small firms.

SENATOR SARBANES. Mr. Flaming, could you give me a couple of examples of your last recommendation on page 82. It is the last one you cited in your testimony.

MR. FLAMING. Yes, sir, Mr. Chairman, I would be very pleased to.

The example that's uppermost in my mind is fuel-cell research. We already have the world's most advanced fuel cell research underway in Los Angeles. It was started with DARPA funding.

This device would make electric vehicles competitive and practical, and could change the nature of distributed electrical power in the country and make it more environmentally friendly and efficient.

What I would recommend or seek would be a federal strategy of supporting research and development in this area, and also supporting collaboration between the federal laboratory and universities where this work is being done, and some of the large and medium-sized companies that have applicable technology and skills and are competitive in connecting this with the market.

I think what we need in Los Angeles is to create new kinds of institutions, new kinds of collaboration for connecting our technology with markets. We need federal resources to create incentives and the financing to get this research done more quickly than our competitors in Japan and Germany.

SENATOR SARBANES. Do you have knowledge to update us on what Los Angeles is doing about cars for their transit system?

As I understand it, they threw out the Japanese bid, and then indicated they were going to embark on a strategy of producing them in the LA region.

Is that correct?

MR. FLAMING. It's under exploration at this point. It's a diffuse problem. They did cancel a contract to have Sumotomo make the cars, and in large part, it was because of concern about local jobs.

On examining the issue, they found that many other regions in the United States and in the world have competitive strengths in particular areas of rail car manufacturing — electric motors or brakes or whatever.

The sense is that there is a need for a better analysis of just what Los Angeles's strengths connect with, in terms of manufacturing components for rail cars and electric cars. So that's being explored. And there's also an interest in connecting this with some state programs around smart highways and so forth.

It's a problem that's being worked right now. It hasn't been sorted out.

SENATOR SARBANES. Mr. Fuqua, It seems to me that the aerospace industry in particular has tremendous opportunities on the civilian side.

Is that correct?

MR. FUQUA. There are some things, Mr. Chairman, that are unique to the niche of business that we make. For instance, in advanced air traffic control systems, taking companies that are proficient in things like optics and using that in automated mail sorting.

But one of the things where our companies are not good — and many have gone into that business — is getting into a lot of consumer items. The thrust has been in making very high technology, expensive items on a small scale. We could probably make the world's finest refrigerator, but I am not sure anybody could afford it.

The companies have had experience. Some have gone into making aluminum boats, and some into solar and water heaters. It has not been successful with the culture of the company.

SENATOR SARBANES. What about making commercial airplanes?

MR. FUQUA. Oh, yes, we are doing that. And that is one of the strong parts of our business — the commercial airplane business. We are very good at that and at commercial space vehicles. We are competing in the commercial airplane business against Airbus, which is our chief competitor.

SENATOR SARBANES. Would you be upset if the government said to the aerospace industry, we are prepared to get into this thing with you to the extent of enabling us to effectively reject the government-private arrangement that is working in Europe and now seems about to be put into place out in the Far East as well.

This is our competitive advantage. We run a $30 billion surplus in the aerospace sector on our balance of payments. Others recognize this.

The Europeans are underwriting their Airbus — $25 billion, at least.

MR. FUQUA. Approximately that, yes.

SENATOR SARBANES. We have the ideology about the market, and the government does not get into it. Meanwhile, the others do it and then they exploit the market to our disadvantage.

What is the industry's reaction if the government were prepared to depart from that attitude and say, we are prepared to get into it with you because we think that a competitive advantage that we have is being taken away from us by the concerted strategy of the public and private sector in our overseas competitors?

MR. FUQUA. Well, we're not looking for government help in getting involved in our business or making strategic business decisions for us.

However, the government can and should play a role through things such as the general agreement on tariffs and trade or the GATT agreements, to make sure that American businesses do not suffer by subsidies from other countries, and that we are playing somewhat by the same rules.

Our government has been trying to do that. We think they could be more vigorous, maybe. And we think that Section 301 of the Trade Act, which comes up for review this year — if I am not mistaken — is very essential and should be kept in the act.

We think the government can help us more by letting us trade internationally, because we are in a truly international market, and try to help our industry so that we at least have some type of equity and access into other markets and so that we are not being penalized because of other government intervention by our competitor governments in making the situation where it is not as competitive.

SENATOR SARBANES. Mr. Kapstein, I have one question.

I take it that your view of microeconomics is that one should not expect a plant that has been making defense equipment to start making civilian equipment.

Is that right?

MR. KAPSTEIN. That's correct, Senator.

SENATOR SARBANES. What about the workers and management of that plant? Is your assumption that they may reappear in some other facility that is doing civilian work in some heavy concentrated fashion? Are they all going to be dispersed throughout the economy?

MR. KAPSTEIN. I suspect the latter, Senator. Just a couple of points, if I may.

There is a very competitive commercial economy out there, and there are many firms vying for a piece of it. So the notion that a defense firm is suddenly going to find some niche in that commercial market that has never before been exploited is, I think, improbable. Although there are anecdotes, and sometimes that will occur, it will be rare.

On the latter, as well, I think that most people will find jobs in new sectors of the economy.

This is anecdotal, but a good friend of mine who works for a defense plant in California said, shortly after the Vietnam downsizing, that he was in the market for a house and found that his real estate broker, stockbroker and insurance salesman were all former defense industrial workers of one form or the other.

SENATOR SARBANES. They would all moved from manufacturing to service.

Is that right?

MR. KAPSTEIN. Exactly.

MR. FUQUA. Mr. Chairman, if I could add a postscript to this very excellent answer that Mr. Kapstein gave. With the economy mushy as it is right now, we find companies that are in consumer goods in a layoff, too. You certainly wouldn't expect an aerospace company to get into the automobile business today, and there are many other very, very soft spots in the economy, particularly in consumer items.

We're different than we were after World War II, where we had a pent-up consumer demand. We do not have that today. We have a very well covered consumer market, and it is doing very well. Customers have a very good choice of items, whether it be hairspray or automobiles. That market is very filled and very competitive right now.

So it's not inductive or attractive to the defense industry, and I do not think they could even attract the investment to go into a consumer-type market.

SENATOR SARBANES. I do not want them to make hairspray. Here is what I am concerned about.

It is very clear, at least from the testimony that we have received in this Committee and by a number of studies, that there is an investment deficit in this country. Japan and the Western Europeans are outinvesting us, both in the public and private sector.

The Europeans now have a $30 billion program for their interrail system, just a major upgrade of their rail. They are going to take it from here to there. They are going to transform travel within the European community, and it's going to be the state of the art for the 21st century.

We are not doing anything like that.

MR. KAPSTEIN. But in order to have investment, you need savings, and I do not think we do a very good job in this country of encouraging savings.

SENATOR SARBANES. Hopefully, we are going to reap a peace dividend out of all of this, and that offers up an opportunity to do some investment in the civilian sector, and hopefully to reduce the deficit, which is the biggest single instance of dissaving that we do, which is not recognized.

Everyone always wants to encourage savings. They think of savings in the private sector only. Then they have proposals to do that which

adds to the public deficit and, therefore, increases dissaving. It usually nets out that it costs you more on your deficit than you gain in the private savings.

The net consequence is to worsen the problem, not to make it better. Isn't that correct?

MR. KAPSTEIN. I agree with you, Senator.

SENATOR SARBANES. Take an earlier example where there was a major commitment to upgrade the air traffic control systems at the Nation's airports, not the current level of FAA-projected activity, but a significant increase in it.

That is new activity. That is a new demand. Those are new contracts. That is new procurement. Someone is going to have to respond to that.

Isn't that an example in which the overlap between the defense and civilian side is fairly significant, and it would open up an opportunity where that the workers and management and some of the technology that has existed in the defense sector could be put to work on a very needed and useful civilian good.

MR. FUQUA. I might point out, Mr. Chairman, what you are saying is absolutely correct, and that would be something that the aerospace industry would be very interested in and would be compatible with their work in their niche business.

I might point out, one of the things that we're working on right now is using the global positioning satellites, in what we now refer to as the future air navigation system, where you know the precise location of aircraft rather than the approximate location, as exists today.

There is an international effort going on now using the Russian system and the U.S. GPS. We're equipping airplanes with these new devices, which you can buy for approximately $800, that can give you — if you are a good fisherman or hunter — the exact location of where the bear roams or where the fish might be biting, or use it in your private airplane.

Those are things that fit the niche of this industry and would be very attractive to the industry.

SENATOR SARBANES. Mr. Flaming?

MR. FLAMING. Thank you, SENATOR SARBANES.

I want to support your suggestion and also to say that there's a middle ground between trying to achieve plant-level conversion, which I would agree with Mr. Kapstein is not feasible, and doing nothing.

That middle ground is to use federal incentives to support restructuring of the industry network; that is, preserve and restructure the industry network rather than individual firms.

Certainly, in Los Angeles, that's a competitive strength. We have thousands of firms and hundreds of thousands of workers and equipment which needs to be restructured to be used competitively. That is an enormous competitive strength, that industrial network. I think that's

the scale on which strategy should be developed–the scale of the regional industrial network.

Thank you.

SENATOR SARBANES. SENATOR BINGAMAN.

SENATOR BINGAMAN. Thank you very much, Mr. Chairman.

SENATOR SARBANES. I want to make one other point, if I could, before we move off of this.

The environment offers an other area in which we could maybe move on the technology. What the Japanese are doing — I am quoting Business Week now: "The Green Giant — It May Be Japan." Then they talk about how Japan had all these problems with its environment. The government enacted Draconian measures to clean things up. Other laws fostered energy efficiency, a by-product of which is less pollution. Now, after years of investments that produced dramatic gains at home, Japan is looking abroad, criss-crossing Europe, Asia and the United States, striking deals on equipment or licensing their approach in everything from plant design to wastewater and air pollution controls. The Japanese have the edge over the United States and Germany in pollution control and basic industry. Tokyo is spending $4 billion a year to broaden the country's environmental skills. Japan is starting to target the environmental market.

That is very interesting. They are always ahead of the curve. It seems to me at some point, we have to start learning our lessons.

Senator Bingaman?

SENATOR BINGAMAN. Mr. Fuqua, let me ask you, if I could, a couple of questions.

In your testimony, you correctly point to some of the problems in our procurement system and indicate that we do have this panel that is working on it, but is expected to give us a report so that we can consider it, not this year, next year.

I am wondering if there aren't some specific things that we need to go ahead and do. I know we have gotten into trouble in the past with a lot of piecemeal.

One area that we have looked at a little bit is this work measurements provision that we stuck in the law back in 1985-86. It seems to me that that has outgrown its usefulness, if it had some initially.

Do you have any thoughts on that or on other specifics that ought to go ahead and be addressed? Unfortunately, we only deal with these issues once a year, and if we do not do it this year, it's another 12 months, 18 months, before anything happens.

Does your industry, or do you have suggestions for things that ought to go ahead and happen this year that we could get consensus on?

MR. FUQUA. Let me commend you, Senator, for setting up what is referred to as the Section 800 panel. There was some language that you put in the bill. I think that that's going to be a very, very successful

endeavor, and there are people that are working very hard on that panel. I am sure they will address a lot of the issues.

But there are some things that we can look at now. We have issues, such as recoupment of nonmajor military sales that go overseas, which puts us at an extreme disadvantage, that could be looked at now.

We made some progress last year in the independent research and development and making that an allowable cost. I want to thank you and your people and others for that help.

There are some things that we're working on now like the ownership of technical data rights. It's a very, very complex issue, but one that needs to be resolved. There are some things like the simplification of progress payments.

I think we have to look at things, Senator, that have no value. I mentioned that in my statement. I know that the Section 800 panel is taking a look at those types of issues.

With the business coming down, there are several things that need to be reviewed very carefully that really add no value to the product, cost the government more, and add burden to the industry.

There are many of those. Some, which I just mentioned, are major things that we need to take a look at and see if they really add to the cost. Of course, what the Section 800 panel is looking at is in a broader context. I think their mandate is to look at the value added to these regulations and do they really serve a good purpose?

Certainly, industry has to be accountable to the government, and it expects to do that. But we can do things in a much better environment so that the limited resources that we have to provide for our national security can go further when we eliminate a lot of the nonvalue-added costs incurred.

SENATOR BINGAMAN. We want to continue working with you to identify anything specific that you think we ought to address this year, in anticipation of the fact that this more comprehensive look is still going to take a while before we get it back.

Let me just ask, Mr. Flaming, about your proposal for giving more government support for the restructuring of regional industrial networks. I think it's an interesting way to look at the problem that exists, and particularly the one in Los Angeles. But I think it's applicable to a lot of the country.

Essentially, what you are suggesting is that we do something much more ambitious than we have considered to date in the way of Federal Government aid. You are talking about what amount of money? Do you have any estimate as to the cost to the Federal Government of doing what you think ought to be done here?

MR. FLAMING. In the job-training area, we recommended a five-fold increase in job-training funds for the transition in the Los Angeles area.

The areas in which we see federal money being most immediately fruitful would be seed capital for new businesses, research and

development to create incentives, and resources to move the network into new markets–fuel cells, for example.

In Los Angeles, certainly, we're in the process of building new institutions. By the way, I think Los Angeles's problems are different than New England's. I think strategies do need to be regional.

Part of the problem in Los Angeles is to build institutions to do this. So I do not think we are in place now with institutions that could use the full level of resources that we need. But certainly, it would have to be based on some fraction of lost defense revenue if you are going to have a significant impact on the industry network.

In Los Angeles, we're down, maybe, a billion dollars or a bit over a billion in a few years, in a couple of years. What fraction of that would be appropriate, I think, deserves some analysis. And I would be happy to provide further thoughts about that. But I think some fraction of the peace dividend ought to go into this effort.

SENATOR BINGAMAN. Okay. Mr. Bosworth, you referred to the problem, or a significant part of the problem that, being on the demand side, we have a lot of businesses out there that really do not know what they need to know.

How do we legislate a solution to that? That does seem to me, and you make the point, I gather, that the ultimate solution to this has to be industry-led.

We are trying to get some kind of industrial extension program, or manufacturing extension program, or get federal funds to support manufacturing extension programs. But is there anything other than that that you see that the government can do to deal with this demand problem — this lack of awareness or concern on the part of a lot of these small manufacturers as to what they need to do?

MR. BOSWORTH. The extension program is very important. Ninety-one percent of the manufacturing establishments in New England have less than 100 employees. If you've walked through such a facility with less than 100 employees, you have a sense of what that looks like, of the demands on the owner-manager. And you know that owner-manager just doesn't have the time, skills or patience to go find out what's out there and to figure out now to use it and then orchestrate it. And he's managing changes across several dimensions simultaneously.

It's a very difficult process.

We need an extension system; not just an extension of government and university programs, but an extension of the small manufacturers themselves — a system that works for them, to help them figure out what resources are out there and how to make them available.

That is a very important first step to take, and it's an obvious one to take.

I think the second general area is beginning to look at policies and strategies that can free up private firms to learn from each other. Perhaps, special measures that are designed to strengthen trade

associations and industry groups so that they can provide forum for small companies to work together might be effective.

Perhaps, as I suggest in the written statement, a re-examination of the antitrust legislation, which creates a sense that somehow collaboration is to be avoided on the part of small- and medium-sized businesses might be useful.

I think those are the kinds of directions of strategy that I would recommend.

SENATOR BINGAMAN. I do not disagree with you, that there's a perception abroad that a lot of what you are talking about is impeded by our antitrust laws.

My strong sense is that that's not true.

MR. BOSWORTH. No, it's not true. I've never talked to an antitrust specialist who felt that that was true. But that's not the point.

Thousands of small business owners and the general purpose attorneys, who often advise them, do think it's true, or at least they have bought into an economic culture in which they have a sense that somehow collaborative behavior runs the risk of some kind of legal difficulty.

It's not true, but the perception is the reality.

SENATOR BINGAMAN. One example that I always think of is the computer systems policy project — IBM and Apple and Digital and other various major companies. They all got together 18 months ago, two years ago, something like that, and for the first time, the CEOs sat down in a room and began to discuss common problems that their industry was facing.

That's not because we changed the law to let that happen. That's just because they finally got to a point where they realized that we're all up against this serious set of problem, not just one firm.

So the economic imperative was sufficiently strong enough so that they went ahead and sat down.

As I say, up until then, I am sure if you had cornered any one of them individually and asked them why they weren't doing that, one of the reasons would be that the antitrust laws do not permit it. In fact, the anti-trust laws did permit it.

But I agree with you, we need to do something to deal with the perception, because it is out there. We need to find some way to strengthen that cooperative activity that goes on in industry.

Well, gentlemen, I think the testimony has been very useful, and I hope we can do some good with it here in the Congress this year.

Thank you all very much for coming.

[Whereupon, at 11:21 a.m., the Committee adjourned, subject to the call of the Chair.]

DEFENSE CONVERSION: A LOOK AT STATE PROGRAMS

TUESDAY, MAY 19, 1992

CONGRESS OF THE UNITED STATES,
JOINT ECONOMIC COMMITTEE,
Washington, DC.

The Committee met, pursuant to notice, at 10:10 a.m., in room SD–608, Dirksen Senate Office Building, Honorable Paul S. Sarbanes (Chairman of the Comittee) presiding.

Present: Senator Sarbanes and Representative Fish.

Also present: Donald Tobin, professional staff member.

OPENING STATEMENT OF SENATOR SARBANES, CHAIRMAN

SENATOR SARBANES. The Committee will come to order.

This morning, the Joint Economic Committee is conducting the second in a series of hearings on the question of defense conversion. During this hearing, we will examine how state governments can help to prepare defense workers, defense firms, and communities for lower defense spending.

The end of the Cold War means that some shifting of resources from military to civilian uses will obviously take place. The question for economic policy is how to ensure that the transfer minimizes economic disruption while building a strong foundation for economic growth in the future.

The problem we confront is not a new one. After World War II, record high levels of defense spending and war production were rapidly reduced. Despite the speed and magnitude of the cutbacks, the adjustment proceeded, by and large, smoothly.

In contrast, the build-downs following the wars in Korea and Vietnam were less dramatic and more gradual. Yet, the adjustment was more difficult. This was partially due to the fact that the government lacked a comprehensive policy to deal with changes in United States defense spending, unlike the planning which had gone into this issue towards the end of World War II for the post-World War II period.

One of the major lessons to be learned from past experiences is that the conversion process can be improved by government policies designed to assist firms, communities and workers with a task of shifting to new forms of production.

Unfortunately, there is no plan, as yet, put forward by the Administration for assisting either manufacturers or workers adversely affected by reductions in the military budget.

Successful conversion requires an active commitment from government and the private sector at all levels, and an approach that would consider the different needs and resources of the various states. The challenges faced in one state may be significantly different from the ones faced in another state.

In many cases, it is the state governments that have a unique understanding of the specific problems facing their communities, and they are often in a far better position to work with companies and communities adversely affected by reductions in military spending.

Today's witnesses will discuss the nature and magnitude of the problem, whether existing programs and policies to deal with defense conversion are adequate, current and planned state programs, and examples of programs that are currently at work in both New York and Florida.

The Committee will hear from Ray Scheppach, Executive Director of the National Governors Association, who will discuss the impact of military cuts on the states and provide an overview of current state programs for defense conversion.

From Brad Johnson, co-chair of the New York State Defense Advisory Board, who will discuss New York's industrial innovation block grant proposal.

Jim Pirius, Director of the Second Careers Program of the Department of Education in Florida, who directs a program that helps people who may be dislocated from their jobs due to reductions in the military budget.

The Committee is pleased to have these witnesses here with us today to discuss this important subject. We will take the testimony of each member of the panel before we go to the questioning. Before turning to the witnesses, I will yield to my colleague, Congressman Fish, for any comments he may have.

OPENING STATEMENT OF REPRESENTATIVE FISH

REPRESENTATIVE FISH. Thank you, Mr. Chairman. I'll be very brief.

I agree with you that a comprehensive policy is necessary. The conversion of industry from defense to peacetime endeavors is one issue and the other issue concerns the workers, whether or not they need retraining and in what form and, of course, retraining for what? Where are the job opportunities at a time when the Nation is simply emerging from a recession?

I'm very happy today to welcome one of your panelists — an old friend of mine — Brad C. Johnson, who appears with us this morning as co-Chairman of the New York State Defense Advisory Panel.

Thank you.

SENATOR SARBANES. Thank you. Mr. Scheppach, we will start with you and go straight across the panel to Mr. Johnson and Mr. Pirius.

STATEMENT OF RAYMOND C. SCHEPPACH, EXECUTIVE DIRECTOR, NATIONAL GOVERNORS ASSOCIATION

MR. SCHEPPACH. Good morning, Mr. Chairman and Congressman Fish. I am pleased to join you this morning regarding state strategies to deal with defense-related dislocations. I will summarize my testimony quickly, but I would ask that the full statement be entered into the record.

SENATOR SARBANES. It will be, without objection.

MR. SCHEPPACH. I'm also submitting a matrix which summarizes state business and worker adjustment programs.

SENATOR SARBANES. The full statements of all the witnesses will be included in the record.

MR. SCHEPPACH. The size of the potential defense cutback is significant. Between 800,000 and 1.2 million defense jobs will likely be lost between 1991 and 1997. Every state will be affected by defense cutbacks to some extent. Texas may lose as many as 75,000 jobs; California, between 150,000 and 200,000 jobs. Twenty-three states will lose more than 10,000 jobs, and only five states will lose fewer than one thousand.

States will be affected differently and for different reasons. Some states will be affected because a significant proportion of their work force is employed in defense-related occupations. Others will be affected because of closed bases and subsequent loss of both civilian and military jobs.

Yet, it is difficult for states to handle this problem without federal support. The defense downsizing is occurring at a time when states are experiencing particularly difficult fiscal conditions. The magnitude of state budget cuts and tax increases over the 1991 to 1993 period is unprecedented since NGA started tracking these measures in 1977.

Thirty-five states — more than two thirds — will be forced to reduce their fiscal 1992 enacted budgets by a total of $5.7 billion this year. This is on top of a $7.5 billion reduction last year. States are requesting an additional $5.1 billion in increased taxes in 1993. They just raised taxes by $15 billion in 1992, and by $10.3 billion in 1991.

This means a total increase of $31 billion over three years, or about 10 percent of total state spending. If we convert that to the federal level to get a sense of the magnitude, it would be like the Federal Government raising taxes by $150 billion over a three-year period.

Even if the recovery continues and accelerates, states will continue to face difficulties for sometime because major portions of state government revenues, such as corporate and personal income taxes,

typically lag behind recoveries. Also, Medicaid costs are continuing to explode.

The governors believe that to maximize resources, programs should conform to the following principles. First, programs should be pro-active. Defense adjustments programs, both new and existing, should allow states to use funds pro-actively to prevent dislocations, rather than requiring them to wait until dislocations occur.

Second, if funding is made available, it should be directed, where possible, to programs based on proven approaches. States already have programs to assist businesses and industrial extension, skills training, export promotion, procurement assistance, financing assistance, planning assistance and technology development.

Federal assistance should support and enhance these approaches rather than devote resources to developing new and competing federal programs.

Third, program funding must be delivered quickly. The fiscal year 1991 Department of Defense appropriation contained $200 million for defense adjustment. Two years later, only $21 million of this total has been awarded. For the most part, existing defense adjustment programs have been slow to deliver services to dislocated businesses, workers and communities.

Fourth, programs should be flexible. If new federal funds are made available to states for defense adjustments, states should have broad flexibility to use the funds to address their own unique adjustment problems. Some states have statewide programs. Others have specific regions that are affected. Others have scattered pockets of dislocated businesses.

States are actively addressing the needs of defense-dependent firms, workers and communities. Some states, including Connecticut, New York and Washington, have defense diversification initiatives in place. Others, such as Maine, Maryland, Massachusetts, Rhode Island and Virginia, are developing initiatives.

You will hear more about New York and Florida programs today. But virtually every state has existing proven programs in place to help firms become more competitive, to help workers upgrade their skills, and to help communities develop more diversified economies.

For example, thirty-eight states have state-financed training programs that seek to minimize unemployment and retain jobs by retraining employees. All 50 states have programs that are actively promoting commercial application of technology and science. Twenty-nine states have industrial extension programs. All states have export assistance programs. And almost all states have small business development centers either in place or being planned.

While all of these programs will be instrumental in meeting the needs of defense-dependent firms and workers, they lack the resources to respond adequately. Currently, the Federal Government has no

comprehensive program specifically designed to provide firms with this range of services. Clearly, any federal initiative should build upon and enhance state programs.

Mr. Chairman, I'd be happy to answer any questions.

[The prepared statement of Mr. Scheppach follows:]

PREPARED STATEMENT OF RAYMOND C. SCHEPPACH

Good morning, Mr. Chairman and Members of the Committee. I am pleased to join you this morning to discuss the important issue of defense adjustment. I hope to confirm your belief that states are already devising effective strategies to deal with defense-related dislocations. I will summarize my written testimony, the whole of which I would ask be submitted for the record. Also, I am submitting for your information a matrix of state business and worker readjustment programs.

Introduction and Background

For more than a decade, defense procurement has been a major force driving the U.S. economy. As an estimated 800,000 to 1.2 million defense industry jobs are lost between 1991 and 1997, this nation's ability to compete in the international economy will be seriously hurt unless an effective adjustment strategy is developed.

Impact to States of Defense Reductions

Every state will be affected by the defense cutbacks to some degree. The Defense Budget Project estimates that twenty-three states will lose more than 10,000 jobs, and only five states will lose fewer than 1,000 jobs. Virtually every state has communities and/or regions that will experience dislocation. Each state's impact will be determined by characteristics of its defense industry, level of defense-related employment, and the general condition of its economy.

States will be affected differently and for different reasons. Many will be affected because of the sheer amount of defense related spending in the state. Some states will be affected because a significant proportion of their workforce is employed in defense-related occupations. Others will be affected

because of closed bases and the subsequent loss of both civilian and military jobs. Even states that have a lower relative share of defense employment are in danger of significant economic impact due to regional and community dependence on military bases and defense procurement contracts.

For example:

Texas could lose approximately 75,000 jobs statewide over the next five years. And in some regions, problems will be especially intense. Texas state officials predict that 19,000 jobs or more will be lost in the Fort Worth area alone during the next several years. California could lose between 150,000 and 200,000 jobs, and while the state has a very large and diverse economy, this massive job loss, combined with job losses from the closure of ten military facilities could depress local economies enough to have a statewide impact.

In Connecticut, for example, 6 percent of the workforce is in the defense industry. It is estimated that half of the 17,000 jobs at General Dynamic's Electric Boat facility in Groton, Connecticut, will be eliminated. The impact of Electric Boat's cutbacks will be exacerbated by the loss of additional jobs as other defense contractors in the area shut down. Maine has already lost more than 5,000 jobs because of reductions in defense spending, many of these are among the most highly paid positions. Additionally, Loring Air Force Base, scheduled for closure in 1994, has played a critical role in supporting not only the community in which it is located, but also the entire northern Maine economy. The Base plays a large role in the provision of education, health care, and firefighting services to surrounding communities and its closure will have a devastating impact on Aroostock County, which will certainly

reverberate across the state.

Fiscal Condition of the States

The defense downsizing is occurring at a time when states are experiencing particularly difficult fiscal conditions. The magnitude of state budget cuts and tax increases over 1991 and 1992 is unprecedented since NGA started tracking these trends in 1977.

- Thirty-five states — more than two-thirds — will be forced to reduce their fiscal 1992 enacted budgets by a total of $5.7 billion. Last year 29 states had to do so.

- States are requesting an additional $5.1 billion in increased taxes in 1993 and they raised taxes by $15 billion in 1992. In fiscal 1991, taxes were increased by $10.3 billion.

- End-of-year balances, an important sign of fiscal health, are at their lowest level in at least fifteen years. The year-end balances are 0.8 and 1.0 percent of total expenditures, respectively for fiscal 1992 and 1993. These are dramatically lower than the 1.5 percent balances during the 1982-1983 recession.

Even if the recovery continues and accelerates, states will continue to face difficulties for some time. Major portions of state government revenues, such as corporate and personal income taxes, typically lag behind recoveries. And even if revenues stabilize, states will continue to have trouble bringing budgets into balance due to double-digit growth of expenditures for Medicaid

(currently 14 percent of state budgets) and corrections (currently 4 percent of state budgets) over the last several years; increasing expenses for education; and the need to repair and upgrade infrastructure.

Principles for an Effective Federal-State Partnership

In providing defense adjustment assistance to workers and firms, states have experience in developing their own programs and accessing federal funds. A number of lessons have emerged that are helpful in thinking about ways to structure an effective federal-state defense adjustment partnership. In order to use limited resources as efficiently as possible, programs should conform to the following principles.

- Programs should be proactive. Defense adjustment programs, both new and existing, should allow states to use funds proactively to prevent dislocations, rather than requiring them to wait until dislocations occur. For the most part, existing defense adjustment programs in the Departments of Defense, Commerce, and Labor make it difficult for states to be proactive in delivering services. We can only deal with dislocations after the fact, even though businesses and workers dependent on defense contracts may know precisely when contracts will end and when dislocations will occur. This makes our efforts less effective and increases the disruption to communities as workers and businesses wait to qualify for needed services.

- If funding is made available, it should be directed, where possible, to programs based on proven approaches. States already have programs to assist businesses with industrial extension, skills training, export promotion, procurement assistance, financing assistance,

planning assistance, and technology development. Similarly, states have readjustment programs that can help defense workers make a transition to the commercial marketplace. Federal assistance should support and enhance these approaches, rather than devote resources to developing new and competing federal programs.

- Program funding must be delivered quickly. The fiscal 1991 Department of Defense appropriation contained $200 million for defense adjustment. Two years later, only $21 million of the $200 million has been awarded. For the most part, existing defense adjustment programs have been very slow in delivering services to dislocated businesses, workers, and communities. Existing programs and new programs should be structured to ensure timely delivery of funding. The more efficient the funding delivery systems are, the more effective the programs will be.

- Programs should be flexible. If new federal funds are made available to states for defense adjustment, states should have broad flexibility in using the funds to address their own unique adjustment problems. Some states have problems state-wide; others have specific regions that are affected; others have scattered pockets of dislocated businesses. Some states have problems with dislocations at large defense prime contractors; others are having problems with small subcontractor networks. This argues for programs flexible enough to permit states to deal with the unique types of dislocation they face.

Existing State Programs

States are actively addressing the needs of defense-dependent firms, workers and communities. You will hear more about some of these initiatives today, but virtually every state has existing, proven programs in place to help firms become more competitive, to help workers upgrade their skills and to help communities develop more diversified economies. I would like to mention just a few examples of programs in three key areas: manufacturing modernization, skills training, and technology development.

Manufacturing Modernization. States have begun to implement policies designed to help small firms modernize and make efficient use of technology. More than half the states have established industrial extension services, often modeled after the agricultural extension service, to work with companies to determine their needs and identify and broker modernization services. Industrial extension agents are experts in manufacturing techniques and business practices. Agents visit manufacturers and make them aware of a wide range of actions that can improve productivity and profitability, as well as assistance available from public, private, and educational sources to implement improvements.

The Massachusetts Industrial Services Program (ISP) has undertaken a Defense Diversification Project which will work in conjunction with local organizations to identify and assist businesses with defense diversification strategies. Assistance will be provided to individual businesses in the areas of strategic planning, obtaining financing, adopting or adapting technologies, redesigning work organizations, entering export markets, and training workers.

The ISP Program was established in 1984 to assist companies to try to prevent closings. Business and finance specialists are on site providing direct assistance within several days of a request. ISP specialists provide advice on developing business plans, marketing, operations, financial planning, and obtaining financing.

The North Carolina Industrial Extension Service, for example, provides technical and management assistance to manufacturers to improve productivity

and quality. The service, established in 1955, provides engineering technology transfer through direct technical assistance, information dissemination, and educational programs.

The Indiana Manufacturing Technology Service has a network of regional offices and field representatives that visit local manufacturers and help identify and analyze technical and management problems. The representatives provide assistance to implement solutions and/or identify other private and public resources that can be tapped.

Skills Training. Thirty-eight states have state-financed training programs that seek to minimize the incidence of unemployment and retain jobs by retraining employees who could lose their jobs because of changing skill requirements in the workplace. These programs are already being tapped to equip defense workers with the skills they will need as firms move into commercial products and markets.

The California Employment Training Panel, for example, funds customized training for workers whose jobs are at risk due to industrial and/or import competition. The panel is supporting an innovative partnership among aerospace prime contractors, suppliers, the Department of Commerce, and the California Community College system for a program to provide training in total quality management practices to small supplier companies. California's Aerospace Supplier Improvement Program (CalSIP) is designed to help suppliers improve their capability and competitiveness, and ensure a strong, capable supplier base for their prime contractors.

Maryland has used its Department of Economic and Employment Development's Partnership for Workforce Quality to provide skills training to defense workers. Assistance was provided to TRANS-TECH Inc, a manufacturer of technical ceramic materials, to develop a training plan that enabled the firm to shift research and development and production from defense to civilian uses.

Similarly, Texas has used its Work Force Development Incentive Program to train defense workers. The program provides customized job training for industrial start-ups and for existing firms seeking to defray part of their expansion costs. In response to an expansion opportunity created by the download of projects from other aerospace firms, Lockheed-Austin Division contracted with Austin Community College to use program funds to train 162 new employees. Lockheed reports that 90 percent of these trainees are still employed. The cost of the program to the state was $473 per trainee.

Science and Technology Development. States also are actively promoting commercial applications of technology and science. Currently, all fifty states have at least one program or activity that specifically encourages technological innovation. These programs support applied research and

development in targeted technologies, and provide financial and technical assistance to firms seeking to introduce new products and processes. As such, they have an important role to play in helping firms as they seek to develop new applications for defense-related technologies.

The Missouri Corporation for Science and Technology, for example, coordinates four innovation centers and three centers for advanced technology. These centers support research aimed at commercialising new technologies, and help entrepreneurs introduce products and processes to the market.

Ohio's Thomas Edison Program promotes technological innovation through collaboration between businesses and the educational community. The program provides support in three ways: 1) a seed development fund, offering grants to determine the feasibility and begin development of products, processes, or systems headed for commercialization; 2) eight technology centers, linking academic institutions with companies in research consortia to commercialize technological advances; and 3) business incubators, which help reduce operating costs for new companies for a three to five year period.

This is just a sample of innovative state programs. States also are helping small businesses enter export markets and obtain capital to finance modernization or diversification strategies, and providing adjustment assistance to local communities. While these programs will be instrumental in meeting the needs of defense-dependent firms and workers, they lack the resources to respond adequately. Currently, the federal government has no comprehensive program specifically designed to provide firms with this range of services. Clearly any federal initiative should build upon and enhance these state programs.

Capacity and Effectiveness of Existing Federal Programs

Current federal programs to provide community response planning and infrastructure development in defense-impacted areas are inadequate in scale and scope to meet the need. The Defense Department's Office of Economic Adjustment has over the last three years funded planning assistance projects

in just eight communities and totaling just $920,000. In October 1990, the Department of Commerce was authorized to receive a $50 million supplement to their $23 million Economic Adjustment (Title IX) program by way of a transfer of funds from the Department of Defense. These funds could be used for community redevelopment and job retention activities, to construct public facilities, and to provide business loans and technical or management assistance in defense-impacted areas. However, only one grant from the $50 million supplement have been awarded to states and local areas due to administrative delays.

With regard to defense-impacted workers, the Defense Conversion Adjustment (DCA) program is the main federal program providing re-employment assistance. The program appropriated $150 million in funds to be distributed as discretionary grants by the secretary of Labor, and administered in accordance with Job Training Partnership Act guidelines. Several issues have prevented the DCA program from realizing its effective potential:

- The funds were not transferred to USDOL and made available for use until October 9, 1991, nearly a full year after the appropriation was made.

- The discretionary funding process is inherently slow and tedious and prevents the timely distribution of funds to state and local areas. Funds are occasionally distributed to those grantees most willing to work through the process rather than those most in need of funding.

- The Department has imposed several administrative conditions on the use of DCA funds that inhibit early intervention and program

flexibility, thus reducing the incentive to apply for funding.

Today, seven months after the funds became available, twenty applications for funding have been forwarded to the Department. Currently, only fourteen percent of the original appropriation, totaling $21 million, has been awarded. NGA's understanding is that recently the DOL/DOD memorandum of agreement was modified at the request of the Defense Department, reducing the DCA funding level to $120 million.

The Labor Department imposed several administrative requirements that may reduce the effectiveness of the DCA program and discourage states from applying for the funds. Most recently, the department told states they could not provide readjustment and retraining services to workers at military facilities until they had received a notice of layoff, which generally occurs just 60 days before the layoff. This restriction inhibits states from applying for funds until just before the layoff, even though they may be aware of a base closing years in advance, since DCA grants are good for just 18 months after they are received. Other administrative requirements that inhibit program flexibility and early intervention include:

- JTPA Title III formula funds spent by the state while waiting for receipt of DCA funding may not be reimbursed once the grant is awarded. Training begun with JTPA formula funds may not be finished with DCA funds. Also, DCA funds may not be used for rapid response expenditures. Each of these restrictions inhibit early intervention.

- The ongoing cost of labor-management committee (LMC) operations must be funded out of the state administration cost category, even though

the role of the LMC is to perform rapid response and basic readjustment functions. This provision inhibits the formation of LMCs.

- Fifty percent of all DCA participants must receive retraining and must meet stringent placement rates following retraining. This reduces the ability of states to provide adequate levels of relocation and intensive job search assistance that may be appropriate in rural base closure situations or for highly skilled defense workers.

Each of these restrictions reduces the effectiveness of the DCA program and the incentive for potential grantees to apply for the funds.

I sincerely appreciate the opportunity to appear before you this morning and hope you will contact the National Governors' Association if we can be of assistance as your deliberations ensue.

I would be happy to answer any questions.

SENATOR SARBANES. Thank you very much. We will now hear from Mr. Johnson.

STATEMENT OF BRAD JOHNSON, CO-CHAIRMAN, NEW YORK STATE DEFENSE ADVISORY BOARD

MR. JOHNSON. Thank you, Mr. Chairman and Congressman Fish for inviting me to testify on an issue of great importance to this Nation's economic future — defense diversification.

I appear today in my capacity as co-chairman of Governor Cuomo's statewide Defense Advisory Panel, created in 1990 and consisting of representatives from the state's leading defense firms, labor unions, academic institutions and government agencies.

Governor Cuomo charged the panel with three primary responsibilities.

First, to assess the impact of the defense build-down on New York State's economy; second, to evaluate existing federal programs that may be of help to these defense firms going through this transition; and third, to evaluate state programs that may be available and to suggest state initiatives where we thought it would be helpful.

To fulfill our responsibility, we surveyed 2000 defense prime contractors in New York and met personally with firms across the state. Our economic impact analysis revealed that New York State had already lost 50,000 jobs since 1987 due to a decline in prime contracts from $9.6 to $6.8 billion. These were high-skilled, high-wage, high-benefit jobs. These were jobs making things, something we do less of than we did a decade ago.

We estimate that New York could lose an additional 60,000 jobs under even a modest defense reduction schedule. The economic realities of a defense build-down are well upon us. Immediate action is needed.

In our review of existing federal programs, we found little help for defense firms. The only federal economic adjustment programs in place come into play after plant gates close and workers lose their jobs. Although important to distressed communities and unemployed workers, this is an economic cleanup, not an economic conversion. It's an economic 911 policy of sending ambulances to the scene of avoidable accidents.

This lack of government assistance was disappointing to the panel and to the defense firms that we spoke with. They recognized that most defense firms by their nature are insulated from commercial and global competition. The small-and medium-sized firms in particular lack in-house expertise necessary to face this new challenge, that many of these same firms are not utilizing modern design and production methods, and that public/private initiatives to help firms boost their ability to convert and diversify are extremely important to the firm's future and growth.

While we found an absence of helpful federal programs, we were encouraged to discover mature economic development programs at the state level that could help defense firms through this transition. The panel's first interim report to Governor Cuomo called for an integration of many of these programs into a defense diversification program, and the Governor created that program a few months later.

We are currently working with over 100 firms in New York. Our program has been successful because it's highly flexible. It recognizes that each manufacturing firm is different, that every firm's diversification strategy is unique. There's no cookbook approach to this. You have to be very flexible and you have to commit for the long haul.

Under our program, our initial contact with defense firms comes through our manufacturing and technology extension service. Extension service personnel have substantial backgrounds in New York in manufacturing operations as former plant managers or executives of manufacturing firms.

We found in New York that the decline in manufacturing in this country has generated some very talented people who are prepared to work for the State of New York at state wages. These are very committed people. I've been in the cars with them going to meetings day in and day out. They really have religion. They're showing great results. They're the real heroes of our program in New York.

They bring to the manufacturing firms the most up-to-date knowledge about new production methods, new high-skilled performance systems, and quality management proposals. They also assist in technology transfer by tying firms to the appropriate research laboratories in the state or to the state science and technology foundation and its programs.

We utilize an extensive portfolio of state economic development resources with these firms. We identify and finance outside experts for these firms in every stage of manufacturing, from export promotion to product redesign to marketing.

We underwrite skills training programs that Mr. Scheppach mentioned in his testimony. We help in the financing of the acquisition of new equipment.

It's been successful because we've been working on it for almost two years, and we've learned that there are some mistakes you can avoid if you start with the firms early. There's a phased approach to conversion by firms. They start with denial, then with fear, then we'll do it on our own, and they finally get to the point of realizing that it's a tough road ahead. It's extremely difficult to diversify while you're also trying to meet payroll and trying to make quarterly earnings statements. It's a very frightening prospect for many firms.

A recent House Armed Services panel report on the future of the defense industrial base recognized New York State as the leader in the

Nation and recommended assisting firms on a national basis using New York as a model.

I have with me, Mr. Chairman, an extensive case study of firms that we have worked with that have successfully transitioned to commercial production, and I'd be happy to submit it for the record.

I also have a report by our panel which contains 50 recommendations for the New York State and the Federal Government to help defense firms in this regard.

Although New York is in the vanguard, other governors have economic development programs that can serve as the building blocks for their own diversification program. With this extensive state experience and program structure in mind, Governo Cuomo called on Congress in early March to authorize defense industrial innovation grants to states.

Under the Governor's proposals, which will be introduced by Senator Moynihan and Congressman Downey this week, each state would develop diversification programs that take into consideration their own unique industrial base, work force composition, and educational and scientific infrastructure. This approach minimizes the risk of top-down centralized conversion policy by channelling funds into ongoing state programs, duplicative bureaucracies and cumbersome delivery systems can be avoided.

Utilizing state programs also assures the delivery of scarce federal resources to the plant floor as soon as possible.

Time is a vital factor. Plants are closing. Workers are losing their jobs. Defense cutbacks will accelerate in the coming years. We cannot continue to experience the erosion of our industrial technological base during this period.

Industrial innovation grants to states with the proper political will could be enacted within months and made fully operational this year. There is no partisan or philosophical difference that need delay prompt attention to this vital opportunity.

If enacted, these industrial innovation grants to states can build a bridge between today and tomorrow for thousands of workers and defense-dependent companies.

Thank you again, Mr. Chairman, for the opportunity to testify, and I'm delighted to take any questions you may have.

[The prepared statement of Mr. Johnson, together with an attachment, follows:]

PREPARED STATEMENT OF BRAD C. JOHNSON

Thank you Mr. Chairman for inviting me to testify on an issue of great importance to this nation's economic future - defense diversification. I appear here today in my capacity as Co-chair of Governor Cuomo's statewide Defense Advisory Panel. This Panel, created by Governor Cuomo in August of 1990, consists of representatives from the State's leading defense firms, labor unions, academic institutions, business associations, and government agencies.

Governor Cuomo charged the Panel with three primary responsibilities. First, assess the potential economic impact of declining defense expenditures on New York State's economy; second, identify and evaluate federal programs that may be of assistance to defense firms transitioning to commercial production; and third, identify and evaluate state programs that may be of assistance to these defense firms and suggest new state initiatives.

To fulfill our responsibility, we surveyed over 2000 defense prime contractors and personally met with representatives of defense firms across the State.

Our economic impact analysis revealed that New York State had already lost 50,000 defense-dependent jobs from 1987 to 1991 due to a decline in prime contract awards from $9.6 billion to $6.8

billion during that period. These were high skill, high wage, high benefit jobs. These were jobs making things -- something we are doing less of now than a decade ago. We estimate that New York State could lose 60,000 additional jobs under a modest schedule of defense spending reductions. The economic realities of a defense build- down are well upon us. Immediate action is necessary to mitigate further loss of jobs and industrial capacity during this transitional period.

In our review of existing federal programs, we found little to help defense manufacturing firms. The only federal economic adjustment programs that do exist come into play after plant gates are padlocked and workers lose their jobs. Although important to distressed communities and unemployed workers, this type of federal assistance merely constitutes economic clean-up, not economic conversion. Moreover, this "Economic 911" policy of sending federal ambulances to the scenes of avoidable accidents does little to preserve, much less to strengthen, our industrial and technological capacity.

This lack of federal assistance was a serious disappointment to the panel and many of the defense firms we dealt with. They recognized that:

- Most defense industries by their nature are insulated from commercial and global competition.
- Small and medium-sized firms in particular lack the in-

house expertise necessary to face this new challenge.

- Many of these same firms are not utilizing modern design and production methods.
- Positive public/private initiatives to help firms boost their ability to compete and diversify are extremely important to the future growth and viability of many defense firms.

While the Panel found an absence of proactive programs at the federal level, we were encouraged to find mature economic development programs, established by New York State over the last decade, that could serve as a nucleus for defense diversification initiatives. The Panel's first interim recommendation to Governor Cuomo called for the integration of many of these State economic development tools into a Defense Diversification Program. As a result, Governor Cuomo's January 1991 State of the State Address initiated the state Defense Diversification Program. We are currently working with over 100 defense firms with considerable success.

Our highly flexible diversification program has been very successful because it recognized that each manufacturing facility is different and each firm's conversion strategy unique.

Under our program, the initial contact with defense-dependent firms is through our state's manufacturing and technology extension

service. Extension service personnel have substantial backgrounds in manufacturing operations as former plant managers or executives of manufacturing firms. They bring to each firm an extensive knowledge of new manufacturing technology, quality management, and production methods. They assist in the transfer of technology by tying firms into the appropriate research institutions as well as the State's Science and Technology programs. They draw on an extensive portfolio of New York's economic development resources to assist each firm. Our Diversification Program helps identify and finance outside expertise in all areas of manufacturing from product design to marketing. We help underwrite customized skills training for existing employees as part of a firm's modernization or diversification strategy. We provide expertise in export sales, and financing for the acquisition of new equipment through our State bank.

Our program works because it's proactive, integrates many economic development tools in one office and is extremely flexible, allowing the State to fashion its assistance to meet the unique diversification strategy of each firm.

A recent House Armed Services Panel report on the Future of the Defense Industrial Base recognized New York State as a leader in the nation and recommended assisting firms on a national basis using New York as a model.

I have with me today case studies of several defense dependent firms who have successfully used this program.

Although New York is in the vanguard, other Governors have economic development programs that can serve as the building blocks for their own diversification programs. With this extensive state experience and program structure in mind, Governor Cuomo called on Congress in early March to authorize Defense Industrial Innovation Grants to states.

Under the Governor's proposal, which will be introduced by Senator Moynihan and Congressman Downey this week, each state would develop diversification programs that take into consideration their unique industrial base, workforce composition, and educational and scientific infrastructure. This approach minimizes the risks of top-down centralized conversion policies. By channeling federal funds into ongoing state programs, duplicative bureaucracies and cumbersome delivery systems can be avoided. Utilizing state programs also assures the delivery of scarce federal resources to the plant floor as soon as possible.

Time is a vital factor -- plants are closing, workers are losing their jobs. Moreover, defense cutbacks will accelerate dramatically over the next few years. We cannot tolerate further erosion of our industrial-technological base while the federal government debates whether or how to create, from scratch, new

programs to transform military into civilian capacity.

Industrial Innovation grants to states, with the proper political will, could be enacted within months and made fully operational this year. There is no partisan or philosophical difference that need delay prompt attention to this vital opportunity.

If enacted, these Industrial Innovation grants can build a bridge between today and tomorrow for thousands of workers and defense-dependent companies.

Thank you Mr. Chairman for the opportunity to testify. I would be delighted to answer any questions you may have.

NEW YORK STATE'S
DEFENSE DIVERSIFICATION PROGRAM

ACCOMPLISHMENTS

AND

DEFENSE COMPANY PROFILES

NEW YORK STATE DEPARTMENT OF ECONOMIC DEVELOPMENT
EMPIRE STATE MANUFACTURING SERVICE

APRIL 1, 1992

NEW YORK STATE'S
DEFENSE DIVERSIFICATION PROGRAM

ACCOMPLISHMENTS REPORT
APRIL 1, 1992

Background

The New York State Defense Diversification Program (DDP) is designed to help the State's defense contractors become more competitive by improving productivity and quality, encouraging diversification into commercial markets, expanding into markets overseas, developing human resources, and adapting new manufacturing processes and technologies.

The Defense Diversification Program was announced by Governor Mario M. Cuomo in his January, 1991 State of the State address. The program is based on recommendations of the Governor's Defense Advisory Panel, a 26-member group composed of representatives from the State's leading defense firms, labor unions, academic institutions, business associations and government agencies. The panel was co-chaired by Vincent Tese, State Economic Development Director, and Brad C. Johnson, Director of New York State's Office of Federal Affairs.

Under DDP, a wide range of state economic development programs are integrated and mobilized to meet the needs of defense companies. Technical, financial and educational assistance programs are made available to defense-dependent firms with the recognition that each firm's conversion strategy is unique.

Outreach Campaign

The State's regional economic development offices and Industrial Technology Extension Service have led an extensive, targeted outreach campaign to identify and offer Defense Diversification Program assistance to a minimum of 1,000 NYS defense-dependent manufacturing firms. Outreach strategies, developed at the regional level, include partnership programs with local industry associations, professional societies, chambers of commerce, and manufacturing groups. Direct mail, telephone contact, and site visits are all being utilized in order to reach as many defense companies as possible.

To date over 700 defense companies have been contacted regarding DDP and its assistance services.

Accomplishments to Date

National interest has been generated in New York's overall defense industry strategy. DDP has been fully implemented as a broad, integrated state response to help meet the needs of New York's threatened defense firms, particularly those smaller firms

that act as suppliers and subcontractors to larger defense industry prime contractors.

New York's Defense Diversification Program has accomplished the following results to date:

- **Industrial Effectiveness Program**

  $1.8 million was provided to 42 defense contractors (56 projects) to improve productivity and competitiveness. 40 additional defense companies are in the IEP qualification process.

- **Economic Development Skills Training Program**

  $1.5 million was provided to 50 defense companies for worker skills upgrading, focusing on technology, total quality management, employee participation, and high performance work organizations.

- **Global New York Programs**

  -Export Market Assistance - 22 defense suppliers received European, Canadian, and Asian export market assistance.

  -Trade Shows - 14 defense industry product manufacturers participated in DED-coordinated foreign trade shows.

  -Global Export Market Service - 4 defense contractors will be or are receiving financial assistance to develop non-defense related export sales.

- **Industrial Technology Extension Service**

  Through its statewide network of manufacturing technology transfer specialists, ITES has assisted over 50 defense firms in new technology applications and accessing technical resources.

- **Procurement Assistance Program**

  Over 250 defense-dependent firms were provided technical assistance in federal/state procurement market development, information access, and bid preparation.

ARO Corporation
Buffalo, Erie County

The **ARO Corporation** manufactures oxygen supply and regulation equipment for high altitude and tactical aircraft. In 1990, defense business represented about 90% of **ARO's** sales.

With 105 employees, **ARO** is one of those small manufacturing companies experiencing the impact of the slowdown in America's defense dependent industries due to federal budget cutbacks.

To survive, **ARO** had to analyze its options, develop a strategic plan and adapt its products to the commercial aircraft market place. It was proud of its people and technical capabilities, particularly in producing life support products, but needed to diversify in order to survive.

ARO decided to implement a two-pronged strategy of enhancing productivity and internal operations while simultaneously switching its marketing focus to the commercial aircraft industry.

The State's Industrial Effectiveness Program provided $60,300 to support **ARO's** diversification efforts, with an additional $235,000 invested by the company.

Among **ARO** self-improvement initiatives was the creation of "teams" comprised of marketing, engineering, manufacturing, finance and quality assurance employees to address product development, design, quality management, and related efficiency problems.

Simultaneously, the firm defined new product opportunities, assessed the redesign of existing products, and developed new market strategies, all with extensive employee involvement.

One significant outgrowth of the IEP project was **ARO's** development of a new commercial product for the medical industry market. Based on existing technology, the product will help **ARO** successfully diversify into new markets.

"IEP is the only such program I am aware of that allows a manufacturer to be fully responsible for its own planning and execution to accomplish a project," said Richard Demmings, **ARO's** General Manager.

Bren-Tronics, Inc.
Commack, Suffolk County

Bren-Tronics, Inc. is a small Long Island manufacturer of high-quality batteries which are utilized in a broad variety of military applications. Bren-Tronics was recently selected by the Department of Defense and the Small Business Administration as the 1992 small business prime contractor of the year.

Bren-Tronics played an important role in producing military-grade batteries that powered much of the portable equipment used by the United States and allied forces during the Persian Gulf War. Bren-Tronics batteries were used in gas detectors, night vision equipment, manpack and other radios, metal detectors, portable lights, range finders and missile guidance systems.

Seeking to diversify its dependency on United States military markets, Bren-Tronics sought New York State's assistance in exploring foreign military export markets.

Under the State's "Global New York" Program, Bren-Tronics participated in a state-sponsored trade mission to Israel which resulted in direct sales by Bren-Tronics to the Israeli Ministry of Defense, the Israeli Defense Force, and to Israeli military contractors.

Based on initial contacts occurring during the trade mission to Israel, Bren-Tronics received its biggest order, for a newly designed battery and associated chargers to be used with a hand-held radio. As the sole-source battery manufacturer, Bren-Tronics could realize over $12 million in new export sales from this State-initiated effort.

Cobra Systems, Inc.
Bloomington, Ulster County

Cobra Systems is a new manufacturing firm in the Hudson Valley Region that produces coiled barbed tape for security systems and a wide variety of military applications. With fewer than five employees, Cobra Systems must explore the development, commercialization and introduction of new production process technologies in order to establish a market niche.

Cobra Systems' founder developed a patented process for producing barbed tape, but needed assistance in developing production machinery, specialized engineering services, and an automated production process in order to produce the new product in high production volumes at the lowest competitive cost.

Working with the Hudson Valley Technology Development Center, which is supported by the NYS Science and Technology Foundation, Cobra Systems received assistance in machine design, engineering, and prototype development. In this effort, the State's Industrial Technology Extension Service assisted Cobra Systems in obtaining a $20,000 matching grant from the NIST Northeast Manufacturing Technology Center at Rensselaer Polytechnic Institute. The State also assisted Cobra Systems in obtaining advanced engineering services from private sector consultants.

The resulting prototype of an automated production machine was successful in producing an improved quality of coiled barbed tape for Cobra Systems. The company now has an automated production facility which has improved the quality and lowered the cost of its product, allowing Cobra Systems to be more competitive in domestic, commercial and military markets, while also enabling the company to enter foreign export markets.

Cobra Systems has recently reached the $1 million sales level.

Dresser Rand Corporation
100 Chemung St., Painted Post, NY 14870

Dresser-Rand, a joint venture of Ingersoll-Rand of New Jersey and Dresser Industries of Dallas, Texas, manufactures gas and process engines and compact,low-weight, air cooled compressors at their plant in Chemung County.

The company's 1600 workers at Painted Post manufactures products used in the oil refining industry and in naval, marine, and aircraft applications, particularly for the military. The company also has plants in Olean and Wellsville, NY.

To improve the efficiency and competitiveness of their manufacturing operations, Dresser-Rand decided to make the transition from cast to fabricated components and to implement manufacturing cell technology. Cell manufacturing involves clusters of workers trained in all functions within a manufacturing process, or "cell." This approach differs markedly from traditional single-function responsibility and requires intensive skills and development and interaction among the workers.

To help implement these changes, the company established a Joint Training Council, which has been meeting regularly since 1987. Recommended training has included support technologies such as personal computer networking and knowledge transfer, various machine tool and manufacturing skills, communication and employee-management cooperation, and technical and support clusters incorporating such disparate disciplines as project leadership, financial awareness, and negotiation skills.

Dresser Rand has received three State Economic development Skills Training awards since 1988, totalling $417,000. These training grants, which were matched with other state resources, have allowed Dresser-Rand to recall and hire over 200 employees. In addition, every workers in the plant has taken part in one or more of the types of skills upgrade training courses mentioned above.

According to a company representative, training has helped the company improve employee productivity and product quality, thereby insuring the retention of jobs and, hopefully, leading to future expansion. The company's efforts have earned it special recognition from the state and federal governments and from the AFL-CIO's Human Resource Development Institute.

Dresser-Rand's spokesperson noted that the training had "opened up the process" such that the overall mission of the facility could be understood by all, and that increased employee participation in company operations had instilled a feeling of "ownership" within the workforce.

DynaBil Industries, Inc.
Flint Mine Road, Box 810, Coxsackie, NY 12051

DynaBil Industries is a manufacturer of precision sheetmetal components and assemblies for the aerospace industry, employing 76 workers in the Capital Region. The company's largest customer is Boeing Commercial Airplanes, and its products are used for both commercial and military applications. (**DynaBil** Sand Covers were used in U.S. Blackhawk helicopters during the Gulf War.)

DynaBil is proud of the fact that some of its state-of-the-art equipment was designed and built by **DynaBil** employees. Examples include a titanium hot forming system, a welding vacuum chamber, and a complete aluminum heat-treating system.

The company employs a full staff of quality assurance inspectors, and in 1991, Boeing chose **DynaBil** to become one of the first groups of its suppliers to implement a Total Quality Management system. According to a company representative: "TQM is "both required by our customer (to be eligible for future contracts) and essential to the long-term success of **DynaBil Industries.**" **DynaBil** was assisted in obtaining orders from Boeing under a "Boeing/NYS Supplier Matching Program" conducted by DED's Procurement Assistance Program.

In January of 1992, **DynaBil** was awarded $24,200 in Economic Development Skills Training Program funds, which will be matched by $85,470 in other training resources to implement the philosophy/principles of Total Quality Management, the basics of Statistical Process Control, and ISO-9000 standards. Training will be done both by a consultant and by Columbia Greene Community College.

The company anticipates training will have "its greatest impact on the skills upgrade of current personnel" as well as adding five new positions in the coming year. It is **DynaBil's** philosophy that "continuing education of (its) employees is a factor int he long-term success of the corporation."

In addition, **DynaBil** believes implementation of TQM, SPC, and ISO-9000 training will be critical in reducing its dependence on U.S. government defense programs and will enable the company to compete for domestic and international commercial markets.

Frequency Electronics, Inc.
Mitchel Field, Suffolk County

Frequency Electronics designs and manufactures frequency standards, oscillators and noise frequency generators used in satellite systems and multi-channel frequency generators. The company employs 365 workers in Nassau County on Long Island.

Over 95% of Frequency's business is in the military, electronics and high-tech industries. The company is a prime contractor for the U.S. Department of Defense, and a subcontractor for several major U.S. DOD Prime Contractors as well as for some overseas customers. The company's component systems are used in space exploration, secure communications, and navigation.

Early in 1991, Frequency undertook a major program designed to assess weaknesses and improve strengths in order to develop a broader offering of customized frequency control and timing products which can be manufactured and delivered within much shorter response times to existing and new customers.

The State's Industrial Effectiveness Program has provided **Frequency Electronics** with $85,000 to support the company's " Partnership for Success" program, which has been put in place by the company to fully involve all of its employees in company operations. FEI is investing $250,000 in this program. The company also has an employee stock ownership program in place.

In December, 1991, **Frequency Electronics** was awarded $60,300 in EDSTP funds (matched by $380,000 in other training resources) to continue its Total Quality Management program, which they call "Continuous Measurable Improvement."

Training, to be conducted by private and in-house trainers, will include Statistical Process Control, Team Problem-Solving, Computer Aided Design, and Management Information Systems Programming.

Frequency Electronics initiated these training programs in response to "cutbacks in Department of Defense expenditures and increased competition from the Industry Community." The company expects the Total Quality Management training and investments in "empowering employees" to enable it to retain jobs, develop a fully participative management environment and adapt to new technologies. Collectively, these endeavors will help the company remain a competitive and viable business.

ILC Data Device Corporation
Bohemia, Suffolk County

ILC Data Device designs and manufactures advanced microelectronic components such as data converters, data bus services, solid state power controllers, and custom power hybrids for the military and commercial markets. The company employs 685 workers on Long Island, with subsidiary companies in Europe, Sweden, and Japan.

The company's products are designed to meet exacting military or NASA specifications, and the company considers itself heavily dependent on U.S. defense contracts. However, they do export roughly 30% of their products.

As part of ILC's diversification and competitiveness strategies, and on the recommendations of an assessment funded by the State's Industrial Effectiveness Program, the company is committed to introducing Total Quality Management skills and High Performance Work Organization principles. Its planned training program is intensive and establishes a foundation for on-going internal training.

In March of 1992, ILC was awarded $33,374 in Economic Development Skills Training Program funds to put this training into effect. (Matching funds are being provided by the Urban Development Corporation's Regional Economic Development Partnership Program.) Training will incorporate inter-personal and communication skills, problem solving, team development, employee empowerment, and job-specific skills improvement.

The Industrial Effectiveness Program has further assisted ILC with a $21,300 full productivity assessment grant to help the company develop a long-range strategic plan including analysis and implementation of options for diversification of its products into commercial markets.

ILC considers U.S. Department of Defense cutbacks to be "irreversible," and believes the State-assisted strategic planning and training will enable it to preserve and expand its customer base and market share, particularly in the commercial and export markets. In the words of ILC's Training Plan: "Training...helps deliver a sense of mission to everyone...even through the hardest of times."

Microtran Company, Inc.
Valley Stream, Nassau County

Microtran Company, Inc. is a 63-employee manufacturer of small electronic transformers for both catalog sales and customized units for military and industrial applications. Microtran's transformers are used in data communications, instrumentation, control and power supply applications.

Although Microtran's product market has been growing, the firm has not developed the full range of capabilities necessary to manufacture transformers in high-volume production runs, making it difficult for the company to compete in this very price-sensitive market.

Microtran has identified, through an internal assessment process, a set of major self-improvement initiatives that will improve productivity, increase production volumes, and automate production planning and scheduling.

The State's Industrial Effectiveness Program provided Microtran with $69,500 to support the above initiatives, which have resulted in significant productivity increases and annual cost savings, thereby improving the company's overall competitiveness and market position.

Through Microtran's IEP initiative, the company reported that it has been able to maintain its sales volume despite deteriorating conditions in the defense and commercial electronic industries, and expects to increase its profitability.

In the words of Microtran's President: "Although we have been subject to severe competitive pressures, we have had negligible job attrition, and we fully intend to maintain our location and our planning for continued growth in New York State."

MRC Bearings
A Unit of SKF USA, Inc.
Jamestown, Chautauqua County

MRC Bearings is a manufacturer of rolling bearings for the aerospace industry worldwide, employing 1,042 workers in the Jamestown region.

MRC holds 45% of the U.S. aircraft bearing market and sells 55% of its product for use in military aircraft, 35% for civilian aircraft, and 10% for use as specialty bearings. Most of MRC's product is sold in North America; 11% is exported.

In early 1991, the State's Industrial Effectiveness Program provided $63,000 to support MRC's development of process quality control and establishment of a quality audit program for measuring internal compliance with established plans.

In December, 1991, the company was awarded $50,000 in Economic Development Skills Training Program funds for training in Total Quality Management principles (such as quality/team processes), high technology equipment, and on-the-job training for 75 new workers. EDSTP funds are being matched by funds from the State's Regional Economic Development Partnership Program, the Job Training Partnership Act, and local monies. Training will be administered by Jamestown Community College.

MRC workers are represented by United Auto Workers local 308 which was very involved in assessing training needs and "instrumental in getting support...and additional funding (for) this project."

The training is part of a multi-faceted NYS inducement to retain MRC's existing jobs and create 75 new ones in an effort to help the company remain competitive. Since 1986, MRC has been investing heavily in capital and systems improvements, including introduction of a Total Quality Program.

MRC expects to enhance the productivity of their workforce, improve the quality of its product, increase customer satisfaction, and remain a strong force in a highly specialized, highly competitive manufacturing niche.

Sensis Corporation
DeWitt, Onondaga County

Sensis Corporation is a five-year old, small Central New York manufacturer of electronics equipment for the defense industry, relating to radar and associated information processors. **Sensis** is competing in a defense market dominated by very large prime contractors, and with 55 employees holds a small portion of the market.

Until recently, **Sensis** was successful in sales, employment and profitability growth, but the combination of defense budget cuts and reallocation of resources due to the 1991 Persian Gulf conflict resulted in a dramatic drop in **Sensis'** sales and revenues. To counter this threat to its long-term survival, **Sensis** is considering expansion into the commercial sensor market based on a combination of partnerships with larger companies and commercialization of its own proprietary products.

Due to its size and unique defense industry market focus, **Sensis** required outside assistance in assessing commercial market opportunities. The State's Industrial Effectiveness Program, through a grant of $10,000 is assisting **Sensis** to analyze of the company's overall business operations, with emphasis on developing a completely revised marketing strategy. Commercial market and financial goals will be developed, and internal strategic documents and existing marketing information analyzed. The overall objective is to allow **Sensis** Corporation to successfully enter the commercial market place, diversifying its high level of dependency on military markets.

In five years, new commercial product development activities and resulting product sales are expected to generate an additional $5 million in revenue for **Sensis** and create up to 30 additional jobs.

Satellite Transmission Systems
Hauppauge, Suffolk County

At its annual strategic planning meeting in 1989, **Satellite Transmission** Systems (**STS**), Inc. realized it needed to increase its focus on higher quality products and operations.

The Long Island producer of satellite ground station terminals, with over 500 employees, faced a dilemma. Because of the growth of fiber optics, its U.S. market was shrinking. For the company to sell overseas against formidable competition, such as Nippon Electronics of Japan and Alcatel of France, productivity and quality had to be improved.

Committed to total quality management, **STS** developed a program called VISION 90's, which was implemented with assistance from the State's Industrial Effectiveness Program.

"The first thing we did was define quality as "what the customer wants," David Hershberg, **STS'** President, recalls. "Then we set two goals - to produce a product that does not fail and to build a high-quality service department - which we felt would make the entire organization world class."

An IEP-supported productivity assessment grant of $90,000 identified a variety of areas for improvement. **STS** and its employees designed and installed systems for management control, job cost control, and material availability prior to manufacturing. The latter project included inventory controls for **STS'** 18,000 different parts.

Strong vendor relationships and partnerships with major subcontractors were also developed. **STS** now receives supplies according to its production schedule and at a lower cost. In return, **STS** guarantees its preferred vendors 80 percent of its business and is helping them to develop total quality processes of their own.

Since the assessment, the company spends one-third less on warranty repairs, and its initial 40 percent defect rate has dropped to .2 percent in some groups. Sales have increased from $135,000 to more than $200,000 per employee.

Satellite Transmission Systems has received the Governor's Award for Excellence in Exporting.

"Through TQM training and teamwork, supported by IEP, we communicated our quality goals to employees and attached several pervasive problems," said Mr. Hershberg.

Special Metals Corporation, Division of
Special Metals & Technologies Corp.
Middle Settlement Road, New Hartford, NY 13413

Special Metals is a manufacturer of wrought and cast superalloy metals, which are used primarily in gas turbine jet engines. They have two plants: one in Dunkirk, NY, and one in New Hartford, as well as a research and development facility at the latter plant. These facilities collectively employ almost 500 workers.

Special Metal products, used in both military and commercial aircraft, are sold to customers in the United States, Canada, Germany, Great Britain, France, and Japan. In addition, Special Metals supplies materials to its sister division, Princeton Powder Division, Princeton, Kentucky, which produces powder superalloy primarily for defense customers. Special Metals also sells its R&D services to some of their customers.

Workers at Special Metals are represented by the International Association of Machinists and Aerospace Workers (Local Lodge 2310), which is involved in and "fully supports the company's efforts to improve quality through...advancement in Statistical Process Control."

In December, 1991, Special Metals was awarded $37,000 in State Economic Development Skills Training funds to continue training workers in Total Quality Management principles, particularly Statistical Process Control.

Training will include team building, team problem-solving, process capability, charting, and analysis for 22 employees. In addition, eight workers will also be trained to serve as internal trainers in total quality techniques.

Special Metals expects that these investments in total quality and worker training will result in an improved overall production process, including better product yields, improved utilization of equipment, increased throughput capacity, shorter lead times, reduced inventory and increased sales opportunities, particularly in the commercial and export markets.

Stride Tool, Inc.
Ellicottville, Cattaraugus County

Stride Tool designs and assembles hand tools such as rapid wrenches, cable cutters, bending products, and oil filter wrenches used in machine tool and original equipment repair and maintenance. The woman-owned manufacturing company directly employs 25 workers; through its outsourcing to designated suppliers it is responsible for the employment of an additional 200 workers within a radius of 100 miles, in a largely rural geographic area.

Fifteen percent of Stride Tool's annual sales are to the military and the space program. The company is a prime contractor selling to the General Services Administration through the D.C. Tools and Procurement Program, which sells to the Department of Defense. Stride is also a subcontractor to many GSA prime contractors selling, for example,refrigeration kits to naval and army bases. Stride's tools are also sold to the NASA shuttle project.

Over the past year, Stride Tool has seen its military and government work drop off significantly to a current sales level that is practically nonexistent. Normally, there are at least six months of orders in the pipeline.

In response to this situation, Stride Tool has applied for and been awarded a $25,000 Global Export Market Service award to identify and penetrate new foreign markets and expand overseas sales in existing markets. The company is particularly focused on Japan, Germany, U.K. and France. The project, which is about to begin, is an innovative combination of consultant-led staff training in export related issues and market research and development.

Stride Tool has previously been assisted in improving its overall competitiveness through grants of $46,500 from the State's Industrial Effectiveness Program to implement a manufacturing control and forecasting system, and $16,304 from the Economic Development Skills Training Program to upgrade employee skills in quality assurance and computer utilization.

SENATOR SARBANES. Thank you very much.
Mr. Pirius, please proceed.

STATEMENT OF JAMES C. PIRIUS, DIRECTOR, SECOND CAREERS PROGRAM, DEPARTMENT OF EDUCATION, FLORIDA

MR. PIRIUS. Thank you, Mr. Chairman, Congressman Fish.

On behalf of Florida's education commissioner, Betty Castor, our governor, Lawton Chiles, and the entire Florida cabinet, I'm very pleased to be with you today to discuss a number of innovative approaches to assist persons who may be dislocated from their jobs as a result of defense cuts.

I join my colleagues at the table here in saying that we are strongly supporting initiatives now before the Congress that will provide federal support for a variety of programs that encourage economic and human resource development.

As the defense industry is restructured to meet new challenges in a fast-changing world, there is no doubt that thousands of people will need to explore new career opportunities. We need to provide support for this effort.

I'd like to just briefly summarize for you and put my full statement in the record regarding the evolution and mission of the Second Careers Office in Florida and how we would like to build upon that framework to make it an even more viable program as the defense industry is downsized.

In May 1990, the Army got a jumpstart on the whole idea of setting up collaborative programs with states to prepare for what then appeared to be imminent downsizing.

If you recall, the budget accord reached in 1990 between the Administration and the Congress called for separations in our armed forces beginning in 1990-91. Obviously, when the Gulf War began, there was a moratorium placed on any separations from the military at that time.

So as a consequence, our program was put somewhat on hold, although a number of people, mostly newly retired persons from the Army, Navy, Air Force and Marines-people, who had been separated for some time, tried to take advantage of a second careers opportunity in Florida.

Our program with the Army was originally based on the premise of a second career in teaching. This was going to be the focal point of the program.

To implement a memorandum of understanding that we then set up with the Army, we established within the Department of Education a second careers office. We immediately set up partnerships with our 67 school districts and informed a number of our community colleges and universities of our plan.

I work in Washington and I'm the federal relations director for the Department. The Commissioner asked me to set up the program. I began traveling a lot in 1990 to Tallahassee where we instituted the program. It quickly became apparent to me that we needed to broaden our scope.

While a second career in teaching is an admirable way of attracting military people to a state, the sheer number of calls that we started receiving made it obvious that there were many, many other career opportunities that we needed to pursue.

As such, we broadened the scope of the program to include partnerships with two of our high-growth industries in the state; namely, the health care and trucking industries. We also set up a partnership with the Florida Department of Law Enforcement for people who are interested in police and correctional work at our correctional institutions.

We did receive a small appropriation from the Florida legislature which kicked off the program, but when the Gulf conflict heated up, we no longer were funded.

We still have the program in operation, however. The Commissioner is committed to it, and we contiune to have an office in Tallahassee to process people who will make calls to us to exchange information, etc.

As I mentioned, we need to build a much more successful framework if we're going to make this program work. The first thing that we'd like to do is to expand the client base. Our program was set up with the Army, although it really serviced all of our military branches.

What we would like to do at this point is to continue to assist involuntarily separated military personnel, but also expand the program to help people who will be dislocated from our defense industries, as well as the Department of Defense civilian employees who will be dislocated.

Second, we would like to have a much more ambitious program to provide for education and industry grants. The industries that we work with in Florida, and our community colleges as well, really did this on a voluntary basis. There was no seed money, no incentive money to do any of this kind of work, but they were excited at the prospect of helping people who have served in our armed services. We realized very quickly the very valuable talents that these people have, and we knew that we would utilize them in our high-growth industries in Florida.

Third, we need to establish a much better data base system to track what happens to these people when they first contact our office and are given some guidance and counselling as to where to go for assistance and help.

To date, we have not had the resources to do any of that. Since 1990, over 1,800 people have contacted the Florida Second Careers Office for assistance, and we have tried to direct them either to community colleges, universities, or industries for specific help–a lot of times, a combination of those three entities.

For instance, let's say you're a veterinarian in the Army. If you want to transfer your skills to the private secter, you can't just go and become a veterinarian in any state. You need to be licensed in the state that you practice in. Therefore, you need to have a viable partnership between an education institution and an industry to really create the entire career process, the path process that you need to effect a job, which is the ultimate goal.

Fourth, we would like to continue to be the clearinghouse for these types of programs to help other states. In many of their statements and certainly in their visits to our state, we've been recognized by the Department of Defense, as well as the U.S. Army, as the model program for transitioning.

We believe that we have something we can offer, and part of the scope of our duties would be to expand an outreach program and to try and help as many other states as possible.

Another component, which is something new that I've given a great deal of thought to, would be to set up a new research study consortium composed of representatives of the public school system, the university system, the Defense Department, and high-tech industries to collaborate on curriculum frameworks essential to prepare students for the jobs of tomorrow.

I think this is really important. How many times a week do we hear, whether it's in our indutries, or in our businesses, or on the floor of the House or Senate, we need to keep a competitive edge for global technology and jobs for tomorrow.

What that really means is that you have to go in and change our curriculums to adequately prepare these kids for the jobs of tomorrow. We don't even know what some of these jobs are going to be.

We need to bring together the best minds that we can from not only our universities and public school systems, but from our industries, especially high-tech industries, where these jobs will be in the future. And we need to start changing our curriculums to meet those demands.

Finally, Mr. Chairman, while I have focused on a framework to assist people with education, training and retraining opportunities that will lead to jobs, I want the Committee to know that the State of Florida is also proposing a comprehensive technology program to assist and expedite the conversion of the military sector of Florida's economy to civilian, market-driven operation. This proposal is near completion and we will be happy to share it with you when it is formally submitted to the Congress.

Thank you.

[The prepared statement of Mr. Pirius follows:]

PREPARED STATEMENT JAMES C. PIRIUS

Mr. Chairman. Members of the Committee.

On behalf of Florida Education Commissioner Betty Castor, Governor Chiles and the Florida Cabinet, I am pleased to join you today in your discussion of innovative approaches to assist persons who may be dislocated from their jobs as the result of cuts in the defense budget.

We, in Florida, strongly support initiatives before the Congress that will provide federal support for a variety of programs which encourage economic development and human resource development. As the defense industry is restructured to meet new challenges in a fast-changing world, there is no doubt that thousands of people will need to explore new career opportunities. We need to provide support for this effort. As such, Mr. Chairman, we commend you and the committee for focusing on strategies to ensure that United States workers enter the 21st Century well prepared to compete in the global marketplace.

During the past three months, many creative proposals have been advanced to deal with effective applications of defense technologies in the private sector as well as retooling our nation's workforce for the jobs of today and tomorrow. I am here today to speak about a program we implemented in Florida in 1990 to assist capable men and women in our armed services and defense industries, many of whom will likely find their careers jeopardized over the next five years.

Mr. Chairman, the statement before you details the evolution and mission of Florida's Second Careers program and a plan to build upon that framework to meet the demands created by expected reductions in defense expenditures. This statement reflects a program model requested by both the House Armed Services Committee and the Senate Task Force on Defense Conversion. I will be happy to summarize it at this time and respectfully request that the entire statement be made a part of the record.

EVOLUTION AND MISSION

Florida's Second Careers program evolved in the spring of 1990 when the United States Department of the Army invited Commissioner Castor to participate in an extraordinary full day symposium focusing on the transition of involuntarily separated military personnel to civilian life. In response to a budget agreement reached between the Administration and Congress, the Army wished to launch a model program, in collaboration with Florida, to prepare for a five-year downsizing of the military. Specifically, the program was to center on a "Second Career in Teaching" for qualified military personnel. As a result of this meeting, and several discussions throughout the summer, the U.S. Army and the State of Florida signed a Memorandum of Understanding (MOU) in August of 1990.

To implement the MOU, a Second Careers Office was established in the fall of 1990 within the Florida Department of Education. Partnerships with six of Florida's 67 school districts were established, and all school districts were informed of the program. Because of Florida's unique alternative certification system, the Second Careers program highlighted it as integral to a transition plan that might lead to teaching jobs for interested and qualified military personnel. An informational package was developed and disseminated to several military bases, the military press and education offices in our armed service branches.

In consort with this effort, the Second Careers Office broadened the scope of the program to include partnerships with two high-growth industries in Florida - the Health Care and Trucking Industries - as well the Florida Department of Law Enforcement. These partners expressed great enthusiasm about the prospects of attracting military personnel to vocations in their respective industries. Because no resources were available, staff and marketing efforts evolved on a voluntary basis.

In 1990, following Florida Cabinet action on the MOU, the Florida Legislature approved a $500,000 appropriation, providing a small allocation for the Second Careers Office and establishing two community college programs to develop and implement counseling, training and job placement activities. Another $400,000 was appropriated in 1991 prior to the Gulf Conflict, providing a total state commitment of $900,000 for transition-related programs. Because of the severe budget crisis in Florida at this time, funding for both the Second Careers Office and community college projects will be reduced or eliminated. Nonetheless, Commissioner Castor's commitment to the Second Careers project remains strong as a successful framework for transition services is in place. We are hopeful that the federal government will recognize efforts such as Florida's, and assistance will be available to serve both existing and new projects.

Because the Gulf Conflict necessitated a moratorium on both voluntary and involuntary personnel separations between 1991 and 1992, and because only limited funding was available to begin the Second Careers program in Florida, our framework for transition services needs further planning before it is fully operational. Most of the close to 1,800 individuals who contacted the Second Careers Office in 1990 and 1991 were planning for a career in the future, speculating that their careers in the military were in jeopardy due to planned defense reductions.

Several persons contacted the Second Careers Office from bases in Europe on toll free lines established in the office. When the Gulf Conflict heated up, a great number of these persons who communicated by phone and in the exchange of information either were not separated or put off further decisions on a new career. As a result of the moratorium on separations, most of the client base became recent retirees or not-so-recent retirees who had read or heard about the program and wished assistance in accessing new job opportunities. These individuals were assisted through direct contacts or by referral to Second Career partners.

While no database system has yet been established - thus no sophisticated tracking system is in place - individuals have been employed or are currently interfacing with industry and community college partners in preparation for a new career. For instance, several individuals are in the process of receiving alternative certification (provisional teaching credentials) to prepare for a teaching position. While the customary range of teaching vacancies is between 10,000 and 12,000 positions annually, Florida, like most other states, has been forced to impose reductions in education funding affecting the number of jobs available. Nonetheless, in high growth states like Florida, those positions will materialize once the economy improves which, by all indicators, it will soon do. Others are currently engaged in preparing for new careers with the assistance of health care staff working in conjunction with the Second Careers Office, and in correctional and law enforcement work through Florida's Department of Law Enforcement.

BUILDING ON A SUCCESSFUL FRAMEWORK

Because of Florida's pioneer efforts, founded on the 1990 MOU with the U.S. Army, we would like to build upon the Second Careers program model.

The following components are central to this effort.

EXPANDED CLIENT BASE

First, because it is now evident that defense cutbacks will have a significant impact on all defense-related activities, the Second Careers program would expand its client base to include not only separating military personnel, but DOD civilian employees and defense-related industry employees who are dislocated as the result of restructuring and/or downsizing programs. Current estimates portend a dislocation of between 500,000 and 1 million individuals beginning this year through 1996. We consider incentives for "voluntary" retirement among civilian and military employers to be significant in the transition process. Individuals who voluntarily separate - because of an incentive package - are, nonetheless, in actuality separating upon request, and thus eligible for assistance under the Second Careers program. Financial incentives will allow for more flexibility to participate in training, retraining and job opportunity (career path) programs established by Florida.

EDUCATION AND INDUSTRY GRANTS

Second, with resources available through grants, specific programs would be established through Florida's university and community college systems, vocational-technical institutions, and high-growth industry partners which commit to establishing and operating training and retraining programs in conjunction with our education institutions. Florida's Private Industry Councils (PICs) will be invited to interface in developing these programs that serve all regions of the State.

DATABASE SYSTEM

Third, to ensure accountability in the career path process, a database system would be established linking all partners to the Second Careers Office, thus enabling immediate reference to individuals receiving assistance under the program. This tracking process is essential to enhance a vital communications network among partners and to demonstrate the veracity of the program which has, as its ultimate goal, job placement for each individual.

CLEARINGHOUSE AND NATIONAL OUTREACH

Fourth, because of Florida's prior (and current) commitment to develop a workable framework for transition programs, the Second Careers program would be a working model for the nation. As a national demonstration program, both time and resources will be obligated to disseminate ideas and structures for transition services. Activities including a clearinghouse for information, travel to other states, regional and, possibly national conferences, etc., will be available to interested parties, particularly state agencies, higher education institutions, and high-growth industries that wish to construct programs of this nature.

CURRICULUM FRAMEWORK CONSORTIUM

Fifth, a special project would be initiated that brings together a research/study consortium composed of representatives of the public school system, the university system, the defense department and high technology industries to collaborate on curriculum frameworks essential to prepare students for the jobs of tomorrow. Both the Administration and Congress are calling for bold changes in our education system to prepare students and workers for the next century, ensuring U.S. capability to maintain a competitive edge in a fast-changing technological world. Justification for this initiative, under the parameters of the grant, is two-fold. First, education reform is integral to

emerging jobs in a changing industrial base - and Second Careers is about jobs now and in the future. Second, there are many talented individuals who will be dislocated in the military, DOD and defense industries. Some of these individuals will be in a position to bring great expertise to this project and will be utilized whenever possible.

STRUCTURE AND ORGANIZATION

As stated previously, our framework for services needs to be enhanced. If federal and state support is forthcoming, the Second Careers Office will maintain its administrative function within the Florida Department of Education. The Florida DOE will continue to administer the program and will sub-contract resources to all project partners through and by Request for Proposals that are fashioned to meet the requirements of the federal government and the State plan.

While the State wishes a degree of flexibility in expanding its current model, the following structure is envisioned to enhance services and job placement.

First, the Commissioner will appoint an advisory council composed of the chief contractor for the project, one representative from each of the contract partners, a representative from Florida's PIC(s), and one representative from each of our military services. In addition, at least two persons will represent defense industries and one representative will be appointed from the Department of Defense. The Council will not exceed 15 Members in total and will meet no more than four times annually for purposes of reviewing and making recommendations for program improvement.

Second, as the administering entity, the Second Careers Office will be responsible for the coordination of programs, ensuring that project partners establish and implement specific education, training, retraining and job placement programs that offer a variety of options and are not duplicative. This includes assurances that programs are available in all regions of the State to accommodate relocation preferences among eligible participants.

Third, the Second Careers Office will be responsible for establishing a database system linking all project partners to a single network that will enhance transition assistance to all individuals. Once the program components are in place and Second Careers is fully operational, a clearinghouse and outreach program will be initiated to assist other states and interested parties in constructing transition programs that meet state needs and interests.

Fourth, the Second Careers Office and project partners will continue to coordinate informational and promotional materials that will be made available to military bases, the Department of Defense and defense industries throughout the country. As the first point of contact for a dislocated individual eligible for the program, the Second Careers Office will continue to handle all initial counseling and information relative to education, training, retraining and job placement opportunities available through participating partners. While many individuals may be referred jointly to either a community college, university or technical school and an industry partner, to develop a career path plan that necessitates course work leading to licensure in any number of regulated industries, other individuals may be fully qualified for a job upon application. These persons will be referred to an industry partner for direct job placement assistance.

As an illustration of how the program model might work for any one particular individual, the following is provided.

Tom Jones is a biochemist working as a civilian employee for the Department of Defense in Baltimore, Maryland. He is notified that his job will be terminated and an early retirement incentive package provided allowing for some degree of financial flexibility. Wishing to take advantage of the Second Careers program in Florida, contact is made with the office at which point an exchange of relevant information is executed. The Second Careers office receives a resume or vita and, in turn, sends a package of materials detailing second career options. After reviewing options, Tom indicates a preference for a health care occupation in West Central Florida, and he is referred to the Florida Health Care Association for assistance. Upon reviewing his credentials, specific job opportunities are detailed and any requirements that necessitate course work leading to licensure in Florida. Suggestions are made for an institution which can provide those services, the timeliness involved, and any counseling or other assistance to aid in the transition process. (If Tom is able to qualify for a job without further education requirements, he can be referred immediately to a hospital, HMO, clinic, etc., where a job is available). Once a plan (or job) is in place, Tom relocates to Florida and pursues the Second Careers opportunity.

Obviously, this is a formal model structure, but, in limited experience over the past three years, such an approach has proven successful. As in everyday life, informal, less structured networking is compatible to effect training and job placement. The number of project partners is not so great that communications between those applying and those serving applicants is burdensome or bureaucratic. Under the Florida model, a person who is losing his or her job and, quite naturally, frightened about the future, is assured of personal and professional attention that will help ease the way for a new career.

Once an outreach program is implemented and other states become involved in transition programs, the Second Careers Office will work actively to establish interstate networks for referral purposes. Within three years, when dislocations may be intensifying, it is hoped that several programs in several states will be available to assist people in their quest for a new career in the private and/or public sectors.

Finally, Mr. Chairman, while I have focused on a framework to assist people with education, training and retraining opportunities which will lead to jobs, I want the committee to know that the state of Florida is also proposing a comprehensive program technology program to assist and expedite the conversion of the military sector of Florida's economy to civilian, market-driven operation. This proposal is near completion, and we will be happy to share it with you when it is formally submitted to the Congress.

SENATOR SARBANES. Gentlemen, thank you very much. I will put a few questions to you, then yield to Congressman Fish.

I am not quite clear in my own mind into what activities you will shift these employees and their companies.

We have 7.2 percent unemployment, so it is not a booming economy. It is not as though there is a lot of demand that is not being met. In fact, there are a lot of people out of work, leaving aside the defense cutback question.

You get these grants and what is it that you do with them?

The question that I am asking is whether the Federal Government ought to be concerned with letting contracts to help create some demand. The Surface Transportation bill would be one instance of that. The FAA could step up the program of upgrading air traffic control systems at our airports, which calls for high-tech, high-skilled people.

In addition, maybe we should think of making subway cars in the United States rather than importing them all from overseas.

But with all of these programs you are talking about, what is it that your people go and do? What is it that you train them to do? What is the transition that you accomplish?

MR. JOHNSON. If I may. First of all, I agree. There needs to be a massive investment in infrastructure — high-speed rail and the sort of job-creating programs that you've talked about in your Committee, Mr. Chairman, for sometime. And your bill, introduced with Senator Sasser this year earlier, was an excellent example of that kind of thinking.

Actually, among the manufacturing sector, retraining is not a very popular term. If you want a tough job, you should be a state employee working for the Department of Labor, going to a plant that just closed, saying, I'm here to help.

Most of these workers in the manufacturing sector look at retraining as basically lower skill, lower pay, lower benefit opportunities because there aren't that many good manufacturing jobs in this country.

That's why our program focuses on retaining our manufacturing base, keeping those jobs during this transition.

How do firms transition to commercial production? We do not supplant private-sector judgments about that. They have to devise their own strategy and they have to implement it. We provide the resources and expertise that they do not have.

Most of these small defense firms do not have a marketing department. They've never needed it. If they're making good money selling a widget to Gruman, they continue to do that until they run into problems.

If they need marketing expertise, we will go out and help them find it, and we will help pay for it. If they need other expertise, we'll get that for them as well. One of the firms that we helped recently made batteries for our Defense Department that was used in Desert Storm. We took that firm to Israel, and they signed a $12 million contract to

provide those batteries — reconfigured for Israel's military use — the first week that they were there.

It was our department that knew of the potential in Israel and it was our department that got them over there. But they're the ones that signed the contract.

Another example is Arrow Corporation in Buffalo. They produce high altitude oxygen systems for fighter aircraft. They have the technology in-house to produce a testing device that would test the resiliency of plastic bags, and they thought that there was a market for that.

Five years ago, they designed this testing machine, but it was extremely expensive to operate. It required an engineer, high maintenance costs and redundancies of systems. It could survive anything short of a nuclear holocaust. It was a commercial failure.

We sat down with Dick Demmings, the plant manager, and talked to him about his experience about a year and a half ago, and got an outside commercial design person to work with this firm. They redesigned the same product — lower operational cost, lower maintenance costs and user-friendly — and it is now a commercial success and being sold to hospitals across the country.

So they had the technology. They had the desire. They wanted to diversify. But they brought a military mindset to the process that led to their initial failure.

We brought in and helped finance the commercial knowledge that they didn't have to make that endeavor a great success.

I will note that only about 20 percent of the firms that we've dealt with have diversified successfully using technology. This is not really a technology-driven process. We have discovered that the single most important ingredient to diversification is innovation, not high technology, not capital. They're important at some stage, but without the innovation, it won't happen. And that comes from the work force.

The firms that have been most successful are led by CEOs who believe in their people, who have introduced high performance work systems, and who have empowered their workers to solve problems and keep track of the quality of their goods. As a result, their workers bring to the firm the innovation that is necessary to find commercial opportunities.

So it's really very much a people-driven process to date. Technology is very important, but a lot of the things that they're talking about in Congress have long-term implications.

One of your colleagues, Senator Bingaman, is pushing technology extension programs, and that's very important. But that should be integrated with follow-on programs, as we have in New York, that take the knowledge through the entire process of diversification.

SENATOR SARBANES. Do either of the others wish to comment?

MR. SCHEPPACH. I'd just make a comment. I think you're right that you have to convert the businesses almost before you get into the retraining of the workers.

States have been doing a lot in the whole area of exports. But also a fruitful area is what's known as import substitution. A number of states have surveyed firms within their individual states and basically asked the question, what parts or inputs are you purchasing overseas that you would purchase domestically if you could find a supplier?

Based on that information, they look for alternative manufacturing firms within that state that would make that product and put them in touch with each other.

So import substitution is another place where you can help firms diversify. But I think you have to diversify the firms first and then worry about retraining of the workers.

MR. PIRIUS. Our program in Florida is really trying to bring people together. It's very much a human resource program.

Just to give you an example, if you are on a base in Europe and you are told that in a month, you're going to be leaving the military — a career you had planned to spend your life in, or at least a significant portion of your life in — it's a pretty frightening experience.

We established immediately toll-free lines in our office. Most of our calls came from bases in Europe and in some other parts of the world. These people were genuinely frightened, genuinely upset about what their prospects were going to be for returning to a country where, in fact, there was a recession going on and what types of jobs would be available.

It's true. With the economic downturn, the jobs that we thought might exist in 1989 are not necessarily there today.

SENATOR SARBANES. Yes, what do you tell them? If I call you up on your hotline from a base in Europe and I'm frightened and concerned, about what job prospects are there when you can not say to me that we have an expanding population in Florida and, therefore, we are expanding the number of teachers we are hiring. We need good teachers. We think you have been in training and would be good at that. But, do you say, we have run into a budget problem here and we have not only frozen the hiring of teachers, but we are laying off some of the teachers whom we already have.

What is it that you say to this person?

MR. PIRIUS. We tell them the truth, and that is the truth as it is right now. Certain jobs might not currently exist; however, the economy will eventually pick up. We have a need right now for 10,000 to 15,000 teachers in Florida, but because of our budget cutbacks, we have had to crowd our classrooms once again. We have not been able to create those positions. But, hopefully, within the next two or three years, those positions will materialize when the economy gets better.

In addition to that, there are a number of industries in Florida, and I'm sure in other states, that still have jobs that are going unfilled because people are either not trained or not qualified to take them, particularly in allied health-care industry jobs in Florida. We have over 160 occupation classifications, and our health-care association has done a marvelous job in Florida, working with people with whom we have referred them to, to show them a way to get a job.

In the beginning, a lot of this necessitates some additional education training, or retraining effort, because you need to get licensed for a regulated industry.

What our program is all about is creating partnerships between education institutions and the industries to work in harmony together and to try and show a person a way to a job.

SENATOR SARBANES. I want to ask another pointed question. Let me lay a basis for the question.

I am increasingly concerned by what I see as states bidding with one another to gain what they would perceive as an economic advantage. It may turn out to be so for the state, but it is not so for the Nation, if you take a national point of view.

For instance, a Japanese manufacturer wants to locate in the United States because there are very strong pressures on them to do that. They want a U.S. production facility for lots of reasons — economic and political.

Therefore, it is reasonable to assume that they would come to the United States without a lot of concessions and incentives. But, then, they play off one state against another as to where they will go within the United States, and, as a consequence, we end up making major economic concessions to get this manufacturer here into state X. Whereas, the Nation, in a national sense, would never have had to make any of those concessions to get that manufacturer into the country.

I would appreciate any comment you may have on that observation. That is a broader, more general observation, but it leads to the question about, if we provide federal assistance, how do we somehow structure it in a way that it does not simply become part of this competitive bidding among states.

MR. JOHNSON. We share your concern about that. In our proposal, and in Senator Moynihan's and Tom Downey's bill, states are explicitly prohibited from engaging in smokestack chasing with these funds. It doesn't make any sense for you to give money to Gov. Cuomo so that he can compete with Gov. Schaefer for these firms.

The way we do that is, we indicate that money can only be spent on existing manufacturing firms. You cannot use this money to attract new firms into your state.

So we think we address your concern.

Second, we also have a provision that requires a maintenance of effort of state programs, so they can't take your funds and use it to supplant other funds and use those funds for smokestack chasing.

In terms of your overall observation, you're absolutely correct. A lot of state resources, we think, are wasted in this endeavor, and I think you'll find that the states that have the most advanced and mature economic development programs are ones that realized sometime ago that smokestack chasing is not as important to their economy as building and nurturing the manufacturing bases and industries that they have in their state to begin with.

SENATOR SARBANES. Ray, do you want to comment on that?

MR. SCHEPPACH. Yes. The governors are concerned about this bidding. We have talked about it a number of times within the association.

In fact, there is even some interest in terms of working out some guidelines. What types of incentives are appropriate and which are not?

For example, if you're competing by investing in training of workers, which is a permanent upgrading of skills, that seems to be more acceptable than, for example, giving a tax credit if you locate in a particular state.

It's an issue before us right now. We're trying to work it through. There's some hope that we could, in fact, develop some guidelines. There are some protocols that might help in the area of what kinds of incentives may be appropriate because they would be permanent, long-run investments, and which incentives would be inappropriate.

SENATOR SARBANES. Congressman Fish?

REPRESENTATIVE FISH. Thank you, Mr. Chairman. It seems to me that you have two problems. One is caused by the downsizing of the military. These are people who may or may not have received significant training in the service and who are going to be discharged. And the other is the dislocated worker, from the example Mr. Johnson gave, of the reduced defense contracts going into a state.

Now, let me just ask this, Mr. Pirius, has Florida undertaken to identify the dislocated workers?

MR. PIRIUS. Okay.

REPRESENTATIVE FISH. Are you talking managerial people? Are we talking engineering professionals? Are we talking unskilled workers?

MR. PIRIUS. To date, we have only worked with the military forces. We have not worked with the defense industries or with the Department of Defense civilian employee.

REPRESENTATIVE FISH. You've not gone as far, then, as New York State.

MR. PIRIUS. Downsizing did not begin in 1990 when it was supposed to begin. You have to remember, our program was really at the bequest of the U.S. Army because they felt that downsizing was imminent, beginning in 1990, because of the budget accord that had been reached by the Congress and the Administration.

In our three years of experience working with the military, we definitely would like to reach out and expand the client base to include defense-related employees.

REPRESENTATIVE FISH. Well, what do you think of this New York diversification program that was described earlier by Mr. Johnson?

MR. PIRIUS. I think it's innovative and certainly worth exploring further. I'm impressed with it.

REPRESENTATIVE FISH. Is it something that you could go ahead and do, as New York did, without federal funds?

MR. PIRIUS. We did receive some state funding initially, and that fizzled out when the Gulf conflict heated up.

Obviously, a second careers program for people who are not going to be separated voluntarily was not a priority for the legislature.

I don't think you need a lot of money to do what we've attempted to do. And, certainly, our industry and community college partners have worked voluntarily to help us. But I think incentive grants would make it a lot easier because you could get an actual system or structure set up that would be a lot more organized and certainly more compelling.

REPRESENTATIVE FISH. Let's stick to what your Florida experience has been, then, with the returning service personnel. What do you offer them?

MR. PIRIUS. First of all, we have a number of people who are currently attempting to get their credentials for teaching. In Florida, we have an alternative certification system that's very good, where we have six or seven centers set up statewide. If you have a college education, of which about 15 percent of our military people have, you can immediately get a job teaching. After finding a job, you then have two years to get your full certification.

The centers are set up geographically throughout the state. It's like going to night school and getting your certification that way.

REPRESENTATIVE FISH. You're saying that many of the military personnel who are returning and in the course of the downsizing want to be teachers? Is that what you're saying?

MR. PIRIUS. One of the reasons——

REPRESENTATIVE FISH. Or, are you talking about them furthering their education?

MR. PIRIUS. No, they want to be teachers. One of the reasons I think that we had so many calls on this from people is because the second-career-in-teaching aspect of the program was the most visible part of the program. The press played on that continually.

We had other career opportunities, but the press kept talking about second careers in teaching; therefore, the military——

REPRESENTATIVE FISH. It seems to me, Mr. Chairman, that it's awfully important that states that are not as well along as New York identify who we're talking about. With the dislocated worker, we need to know who it is. We do have some testimony from the Department of Defense

that it is going to be largely managerial and professional people, which is a totally different ballgame than an unskilled worker would present to a state, it seems to me.

In case you gentlemen weren't at the last hearing, I think it goes without saying — and I think it's important to repeat — that we had some testimony from Dr. Capstein at Harvard that defense firms can only convert when the economy as a whole is growing and when the defense firm can identify a new product in which that firm can bring something new to the market place.

I think that just makes life a little more difficult, but I see his point, if the conversion results in making something that's already currently produced in a bad economic climate, you're not going to do too well.

MR. JOHNSON. If that was a question, I would agree, obviously. Retraining programs are more successful in a growing economy. Finding new products is more easily done in a growing economy. But we shouldn't wait for the growing economy to solve those problems. And second, even in a growing economy, many defense firms will not be prepared to take advantage of the opportunities that are out there without some of the kinds of expertise that we bring into play and to their awareness.

REPRESENTATIVE FISH. I think the more general question would concern the rate–as far as the one thing that the Federal Government could control–the rate at which these layoffs occur, the rate at which the downsizing would occur.

My question to all of you, all three of you is, would it be better for the American economy to slow the cutbacks in defense spending and to slow the reduction in military personnel to a rate where you have minimal layoffs, or would it be wiser to more rapidly cut defense and use the money to provide economic assistance programs?

Any of you have any comment on that?

MR. JOHNSON. I'm not a military expert. My sense is that the best approach to defense spending is to spend money on the weapons systems that you believe you need to defend the country. I do not think it's a good industrial policy to build things you don't need.

Generally, obviously, there's going to be a reduction in defense spending over the next several years. The magnitude and the degree by which the Congress decides to reduce the spending should be driven by our defense needs, primarily. Obviously, you must be mindful of the economic implications.

Our view is, nurture these kinds of state programs. You made the point that we built our program without federal assistance–that's true.

To give you an example of the kind of demand that we have in New York where our program has a great reputation, we announced that we were going to do a special diversification program for nine high-tech firms on Long Island to see what we could learn from that, as well as

work through it with a high technology industry, in a very concerted effort.

Ninety firms showed up to apply for that program. We were only able to deal with nine. We're not quite sure that we can take all nine firms through the entire process.

So the demand is there. If the Federal Government were to become a partner with the states, we could expand our operation much more rapidly than you could if you tried to create a federal program.

REPRESENTATIVE FISH. I guess, Brad, what I was getting at was whether, faced with this problem that every state will have, there's any sense today that it is overwhelming, that it would be helpful if the whole process slowed down so that you could get a grip on it, or whether you are happy with the rate of conversion and the rate of return of personnel.

MR. JOHNSON. It's overwhelming. We've already lost 50,000 jobs. The impact is substantial even under the modest decline in defense spending that we've experienced since the peak in defense spending in 1987.

It's causing a great deal of economic dislocation in our state. I suspect it will become worse as the defense spending declines unless there are programs put in place quickly.

It takes firms some time to go through this process, and the sooner the programs are out there, the sooner you can begin to deal with the economic difficulties that these firms must confront.

One point that I would make about the industrial innovation grants is that it puts money in——

REPRESENTATIVE FISH. Industrial, what?

MR. JOHNSON. The industrial innovation grants. It puts money in a very competitive environment.

Once you create this program, no governor will want to be the last one to put together a diversification program, and no governor will want stories written about how his program is not working while his neighboring governor is doing a great job.

So governors are, by their nature, very competitive politicians. They will work very hard to put these programs in place if there's a federal program to help them.

REPRESENTATIVE FISH. Yes. Once you get the diversification plans in place by all the states, that seems to be the first step, I grant you.

But we haven't really talked about what specific programs the Federal Government would be asked for. Is that going to follow the diversification experience, or is that pretty well known today?

MR. JOHNSON. My sense is that what Congress should avoid is a categorical approach to this issue. You should steer clear of creating a variety of federal programs to deal with the issue, because what works is the integration of various tools.

Congress has agreed to, it seems, in the House and Senate budget resolutions is to spend a billion dollars on some kind of economic conversion adjustment program. Obviously, some of that money will have to go to unemployed workers and distressed communities because people will lose their jobs and plants will close and bases will be closed. You can't deny that.

But, we think, while you put some money there and you want to save some money for the technology type programs that may be helpful down the road, a good portion of that money should be focused on trying to retain our manufacturing base during this period.

The best way of doing that is let the states do it. Give them the money. Let them devise programs that are unique to their needs.

Our program would not work in. Maine. Our program would not work in Alabama. In those states, they have a very centralized defense presence in their states. They would devise programs very different from ours, and, therefore, much better than ours for their own state.

So we believe that the state flexibility and the federal resources are a good deal. You have the money. We have the programs. Allow us to develop those programs to deal with the unique problems of defense firms.

REPRESENTATIVE FISH. Thank you, Mr. Chairman.

SENATOR SARBANES. It seems to me that all of these programs have ato replace the demand that is going to be lost from the cutbacks with some other kind of demand, particularly if you are talking about large cutbacks.

It seems to me that you ought not to go on producing a weapons system that you do not need simply in order to create jobs. We can create jobs in the civilian sector to produce things that are needed rather than unneeded weapons systems.

You can improve mass transit, or highways, or water and sewer systems. There is a whole list of things that can be done.

Of course, you may then be creating jobs for a different category than the people who are losing their jobs, and that is part of the challenge of transition.

We have workers at Westinghouse who are making military radar. It is not much of a transition for them to make civilian radar. There are hundreds of airports all across America that desperately need to upgrade their air traffic control systems. The only thing that is lacking is that we are not putting the money in there for contracts to upgrade air traffic control systems.

We need the air traffic control systems. It is not make-work. It has to be done. It is affecting our productivity and, therefore, our competitiveness.

So you fly around JFK for a couple of hours. That is all right out of your productivity. It is just lost time, which is a serious problem,

particularly when the economy in and of itself is not expanding at a rapid rate.

If Florida had money to fund its teachers' needs, this second career program in teaching could be dynamite. You get people in the military saying that this is terrific. Florida has arranged for them to start working and to get their certification as they go. They say: We've been doing a lot of teaching and training in the military and we think we are pretty good at it. This is a good second career as we leave the military.

So it all makes sense, except that the job is not there because the resources are not there. It seems to me, if we are talking about major cutbacks, we have to start realizing this peace dividend and addressing these other needs.

We have to give some thought as to how we get the money out there to create the demand that will create some of these job opportunities.

The jobs will be created in the private sector. The government will be letting contracts to upgrade air traffic control systems instead of contracts to put radar into military airplanes, or it can do something in the transportation field.

What is the largest company that you have helped to accomplish a transition in New York State?

I was looking through these case studies, and most of them, I have a sense, are fairly small companies.

Is that correct?

MR. JOHNSON. That's correct. The largest company would be Hazeltine Corporation on Long Island. It employs 1,200 people. Like Westinghouse in your state, it basically produces very sophisticated radar systems for defense application. In fact, they're the company that builds the radar into the wings of fighter aircraft.

They have used a number of our programs. They used our skills training program to introduce a new production method that cost them $2 million. They took a quarter million dollars in state funding. The first year that this new production method was in place they saved $10 million in operational costs from spare parts, defects and that sort of thing.

Now, that's not a direct military conversion story. What it is is a program to keep that firm viable because they have now a $10 million cushion. They can take lower defense spending. The revenue per worker is up. They'll survive some downsizing of the defense business.

They are working on a packet radio program that they hope will be able to send more than one message through a frequency. It's rather sophisticated. I've seen the machinery. It's hard to figure it out. But we're basically betting on that company. We're helping them become more productive. We're allowing them to survive the spend-down in defense spending through the initial years.

Our hope is that they will be able to use this new technology for commercial application.

But, if the firm went bust in the interim, all of that work would be lost, and those workers would be on the street, and you'd have great capacity lost as a result.

So some of our programs, I'll be honest, do not lead to direct commercial production. But they do keep firms viable because they become more productive.

Another firm that we worked with, once again, helping them to finance skills training for new production methods, reduced the timeframe of their production cycle from six weeks per item to four days. Now, that firm can be more competitive in the global economy when they find a market or they find the goods.

So the largest firm is Hazeltine. We were there two weeks ago. They just signed a contract to put radar in planes to pick up news signals that can be given to the passengers in trans-Atlantic flights.

They've already begun to find some commercial business. But the big payoff will be the packet radio program, if it works.

SENATOR SARBANES. Do you want to comment on that, Mr. Scheppach?

MR. SCHEPPACH. I would have to agree that both the highway trust fund and the airport and airway trust fund have fairly large surpluses right now that could be accelerated to create some jobs, although it would increase the deficit for a year or two because of the trust fund revenues. It's a zero-sum game, essentially. It will not increase the deficit over the long run.

SENATOR SARBANES. I understand that the bids that come in are pretty good nowadays. In terms of getting value for dollar, this is a good time to be letting a lot of those contracts because people are anxious to get the business, and they are willing to take very small margins.

Is that correct?

MR. SCHEPPACH. From what we know, that's true, Mr. Chairman.

The other point I was going to make, though, is that you have to maintain a national perspective in this conversion. It doesn't do a lot of good for New York, for example, to convert and create ten jobs at the expense of Connecticut or New Jersey. You really have to have a foreign outlook on this conversion, it seems to me. You either have to concentrate on stimulating exports seriously or get serious about import substitution.

We need to create jobs in the United States, be it in Connecticut or New York, at the expense of jobs in other countries, rather than displacing jobs from one state to the other.

SENATOR SARBANES. Or an expansion in output altogether.

MR. SCHEPPACH. Altogether, that's right, an increase in aggregate demand.

SENATOR SARBANES. Yes.

MR. SCHEPPACH. Your emphasis on demand is right. You can't spend a lot of money on retraining of workers for jobs that aren't in existence.

I think one point that I'd like to make is that this is a problem that states deal with every day, that they have a large menu of services and programs that focus on this problem.

What's different about this particular problem is two things. One, the magnitude. It's substantially larger than what they deal with on a day-to-day basis. And second, the jobs being lost are very high-income, high-skill managerial positions. States aren't as used to retraining that particular type of worker as they are lower income workers. So it's different in that sense.

But aside from those two things, this kind of dislocation is very similar to the types of dislocation that states deal with on a day-to-day basis.

That's why we say that enhancing existing state programs makes the most sense.

SENATOR SARBANES. Gentlemen, thank you very much. We appreciate your testimony. It has been a very helpful panel.

The Committee stands adjourned.

[The following letter was subsequently supplied for the record:]

[Whereupon, at 11:17 a.m., the Committee adjourned, subject to the call of the Chair.]

Honorable Paul Sarbanes
Chairman, Joint Economic Committee
U. S. Senate
Washington, D. C. 20510

Dear Chairman Sarbanes,

I want to begin by thanking you for inviting me to testify on behalf of Commissioner Castor and Governor Chiles on Florida's Second Careers program. Your kind words concerning the framework we have established are much appreciated.

My primary reason for this follow-up letter to you is to clarify a few points which I do not think I emphasized clearly or effectively during the question and answer session.

First, while I admit that the teaching jobs in our state are scare at this time due to severe budget cuts in our education budget, we hope to restore education funds lost last year in the new budget accord which must be in place by July 1. It appears at this time that both the Governor and Legislature are in agreement that between $500 and $700 million can be restored and passed along to our school districts. This will most definitely translate into thousands of teaching positions we clearly need to meet demands of our state growth over the past several years. As these positions are created, dislocated military personnel with college degrees, particularly in mathematics and science, should find considerable opportunities to teach in our public school system.

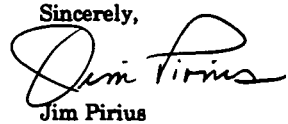
One of the problems we have experienced with the Second Careers program is the emphasis placed almost exclusively on it being a Second Career in Teaching program. As I tried to explain in the hearing, Second Careers was initially created, by MOU with the Army, as a demonstration for this purpose. However, our industry partnerships have been in place for two years now, and these will be expanded as a growing economy allows for more job opportunities.

More important, however, is the fact that, despite the recession and slow economic growth, certain industries in Florida continue active recruitment for unfilled jobs. This is particularly true in our health care industry where there is an acute shortage of qualified personnel for a number of allied health care jobs. The same

situation exists in our trucking industry and, in some areas in Florida, in police and corrections work. Our service industries, particularly occupations related to tourism, hospitality, hotel and restaurant management, are also experiencing shortfalls in trained workers. As the economy improves, and hopefully it soon will, we believe opportunities for persons displaced due to armed service cuts and defense industry cuts will be available not only in Florida but in many other states.

Again, Senator Sarbanes, we do appreciate your interest in our approach to education, training, retraining and job placement assistance for persons who may need new careers as the result of reductions in defense expenditures. We believe the Second Careers program, while not operating at its maximum potential in tough economic times, nonetheless, offers a sound framework for our future needs.

Sincerely,



Jim Pirius
Director, Federal Relations
Florida Department of Education

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