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### THE SPACE PROGRAM AND THE NATIONAL ECONOMY

The opportunity to be with this group of Pennsylvania bankers at its 70th Annual Convention is a welcome one. It is always a privilege to meet with business and civic leaders to consider the challenges and opportunities afforded our Nation in space. It is a special pleasure today to meet with representatives of a state which has contributed so much to the national space effort.

Hailing from Pennsylvania are some outstanding leaders in the national space program, notably two members of the House Committee on Science and Astronautics: Representative James G. Fulton of Pittsburgh and Dr. James D. Weaver of Erie. Two of our astronauts, Navy Lieutenant Charles Conrad, Jr., and Air Force Captain Theodore C. Freeman, are natives, from Philadelphia and Haverford.

Factories throughout your state are manufacturing hardware and equipment that will be used in the space program. Your universities and

colleges are carrying on important research work. The Department of Defense centrifuge at Johnsville is used extensively in the training of astronauts. These are only a few examples of Pennsylvania's contributions to the national space effort.

As your state has affected the national effort by its great contributions, so too has it been affected economically -- as is true of most of the other forty-nine states. The space program is a two-way street. While it is sustained by the efforts of Americans everywhere, its economic benefits percolate down not only to the state but also to the county and city level -- down into the pocketbooks of hundreds of thousands of our citizens.

Before discussing the economic ramifications of the space program, I would like to report on the progress of our activities in manned space flight. This is the area of my responsibility and is only a part of the broad U.S. space effort that includes scientific investigation, advancement of space technology, and the development of civil and military applications of that technology. But the largest single element in the program is manned space exploration.

One of the major milestones in the manned space flight effort was passed on January 29 of this year when we overcame a six-year lag behind the Soviets in launch power and placed in orbit the heaviest known payload in the history of space flight. The vehicle that accomplished this success was the Saturn I, in the second stage of which this country is pioneering in the use of liquid hydrogen as a rocket fuel.

In this first experimental flight, the payload weighed almost 10 tons, about 40 per cent more than was orbited by the Soviet Union.

Another important recent development was the successful first unmanned launch of the Gemini Titan II space vehicle, which if all goes well will lead to the beginning of manned flight in the two-man Gemini program about the end of this year. The Gemini program, which follows the pioneering work in Mercury concluded last year, will provide important information about man's capability in long-duration flight, space maneuvers, and rendezvous and docking operations -- during which the spacecraft and target vehicle will be joined and actually coupled in orbit.

This program will provide essential experience for the manned space flight activities of the Department of Defense, as well as for the Apollo program, in which we will extend our space flight competence outward to the moon by the end of this decade.

In the Apollo program, we have been building up our efforts for three years in constructing the facilities, training the people, marshalling the industrial support, and manufacturing the flight hardware for test on the ground and in flight. Now we are "filling the pipeline" with test hardware as we approach the period of maximum effort.

The status of the program today is depicted in the film which I would now like to show you and which was shown recently to the House and Senate space committees.

(FILM: "FILLING THE PIPELINE")

It is apparent from the film -- which tells more about the program than I can say in words -- that the Nation's investment in space is building a permanent structure of basic resources which will be available in the future for whatever purposes the national interest may require. The program is being pursued on a broad front on a carefully planned basis.

What is this broad space capability? It consists of large launch vehicles and advanced spacecraft; the operational systems to permit their extensive use; and the engineering complexes for their assembly, test, and launching. It consists of huge environmental chambers, simulators, and centrifuges for astronaut training. It consists of a worldwide tracking and data acquisition network together with the Integrated Mission Control Center, capable of controlling a number of flights simultaneously.

In building up these resources, we are developing new and unprecedented means of organizing and managing large-scale research and development efforts. As business leaders, no exercise of imagination on your part will be required to appreciate the challenges inherent in the organization and administration of this great effort. We have undertaken, within the framework of the free enterprise system, to perform the largest job of research, of development, and of manufacture ever attempted by this or any other nation. Its

success requires the mobilization of the best of science, of engineering, of industry, and of government.

The immense cost of the research required to remain abreast of, or surpass, the effort expended by a totalitarian system is beyond the resources of even our largest industries. Without the sacrifice of individual enterprise, and our traditional freedoms, how do we organize ourselves so as to be assured of success?

Underlying NASA's method of operation is the basic concept that its objectives can best be achieved by using and developing the basic resources of the Nation's industries and universities. Fully 95 percent of the manned space flight program is carried on by the Nation's industry.

What is the economic value of our space efforts? They represent a major source of industrial and technological strength. They undergird the Nation's economy and will play a vital role in future economic growth. They involve the acquisition of knowledge, which is power. As Fortune magazine has phrased it (quote):

"...new knowledge is a dukedom whose great wealth and resources cannot even begin to be estimated or exhausted. Already the new knowledge acquired in space exceeds by far the value of funds so far spent. For knowledge, more than guns and butter, is the true power of modern states." (end of quote)

The technological fields involved in the program embody many of the forces with which industry, business, and national leadership are concerned in this age of advanced science and technology. The process

of economic growth necessitates the rapid development of technology-- the type NASA is generating.

An often asked question is: What are the impacts--regionally as well as nationally -- of the expenditure of these vast funds? The funds are being spent in our factories and laboratories throughout the country -- for salaries and raw materials; for parts, components, and subsystems provided by contractors, subcontractors, and suppliers.

You know that NASA is investing three billion dollars a year in manned space flight. In sub-contracts alone, the figure was \$1,027,000,000 for 1962 and 1963 -- based on reports from key contractors. This amount was distributed to 2,697 different subcontractors located in 46 states. Sixty-six percent of the subcontract dollars crossed state lines.

Small businesses received about \$187 million, or 18 percent of the awards. Of the 2,697 subcontractors, 1,806, or 67 percent, were small business firms. Of the total subcontract dollars, \$111 million, or 11 percent, went to labor surplus areas.

How did Pennsylvania fare in subcontracts during the same period? It ranked third among our fifty states, receiving 7.3 percent of the total, or \$74,613,807.

In addition to this, of course, Pennsylvania firms were working on many direct contracts. As of December 31, 1963, Pennsylvania firms in almost eighty cities and towns were working on \$81,558,000 of direct contracts.

Included in this figure are research and experimental projects at Lehigh University, Drexel Institute of Technology, Franklin Institute, University of Pennsylvania, Temple University, Carnegie Institute of Technology, Mellon Institute, University of Pittsburgh, and Pennsylvania State University.

What other impact does the space program have on the economy? It provides for the development of new manufacturing processes and new products. Some of the industries that have already been affected in a major way include: electronics, heating and air conditioning, insulation, power, metals, fuels, ceramics, machinery, plastics, instruments, and textiles.

And NASA is working actively to broaden this list. Through its Technology Utilization Program intensive efforts are being made to identify new products, new processes, and useful innovations as they appear in our research centers or in our contractors' plants, and to make them generally known and available for use.

The extent to which useful "transfers" of space technology to the civilian economy take place will depend in large part on the initiative shown by people in industry and business seeking opportunities that space technology offers.

The Technology Utilization Program has two basic goals: to accelerate the transfer of NASA's technological advances to the civilian/industrial community and to encourage efforts within regions to make the best possible utilization of space technology.

Experience has shown that technological transfers from the large Government research and development programs in defense and space do not take place automatically. As businessmen you know the difficulty in getting the results of research from the laboratories to the production line.

People performing the actual work in the NASA centers and in the plants of NASA contractors are in the best position to recognize new departures in technology and techniques and to indicate the areas of potential application. But we must still rely on the business community to supply the profile of industrial or consumer needs. We have been greatly encouraged by industry's reaction to our Technology Utilization Program.

How much money are we investing in space?

The space program represents an investment of less than one per cent of our gross national product. It is between 4 and 5 percent of the annual Federal budget and only a tenth of the defense budget.

Now the primary emphasis in the banking business is that you and the customers of your banks, invest wisely. And, as citizens with an expert knowledge of fiscal affairs, you play a leading role in insisting that the national resources of this country are also wisely invested and put to good use.

A bank thrives, and a community prospers, however, only when the bankers say yes a good proportion of the time -- yes to the right thing at the right time.

You have seen this morning how the Nation's resources are being invested in facilities across the Nation, in the training of people, in the development of a space operations complex. But did you know that more than 90 percent of our dollars is spent in creating and maintaining the grand complex of industry, government, and people resources needed to carry out this program? Less than 10 percent of our dollars is spent on the actual hardware we will use in space.

I believe that our decision to make a substantial national investment to explore space and to make use of space was a good one. And, if America intends to remain a free nation, and to grow to be an even greater nation, its answer to the challenge -- and the opportunities -- of space must continue to be a clear yes.

Our country has the industrial capacity and the intellectual and other resources required to lead in space exploration. If we do accept the challenge and do succeed, our nation will benefit in many ways: in international prestige, in national security, in the acquisition of scientific knowledge, in technological capability, in economic health, and finally, in achieving a better way of life for all of our citizens.

More than ever today, because of the dynamic pace of modern technology, the United States must continue to move forward, to be the world leader in space. In so doing, it will further develop its economic, industrial and technological strength.

With the powerful thrust of our exploration of space, we are building a stronger and wealthier nation. I hope that you will agree that the program deserves your full support.