Chapter 7
Why Should We Save American Manufacturing?

The average American rarely thinks about manufacturing, and if he or she thinks of it at all, he or she thinks that it is "dying." We've considered plenty of evidence that shows that American manufacturing is in serious trouble and may need to be on "life support." Many may wonder why we should expend any effort to save American manufacturing. What difference would it make to the United States if we lost virtually all of our domestic manufacturing?

Americans may be surprised to learn that the United States is still the world's number one manufacturer, accounting for about a quarter of global manufacturing output. The U.S. manufacturing sector accounts for $1.5 trillion or 12 percent of the country's Gross Domestic Product (GDP), which if it were a country, would make it the eighth largest economy in the world. Manufacturing output of the nation's factories in the United States today is at the highest level in history and continues to rise.[1]

From 2001 to 2005, manufacturing contributed more to real GDP, adjusted for inflation, than any other single sector. Manufacturing GDP growth averaged 4 percent a year compared to 3.5 percent growth for the overall economy.

While manufacturing's share of the economy, measured by GDP, declined from more than 25 percent in 1950 to 11.9 percent in 2007, 80 percent of the drop in manufacturing's share of GDP has been from declines during recession years.[2]

GDP is a measure of the dollars spent for products and services. More of the country's resources today are spent on business services, health care, and education, in regions where prices have risen significantly. Prices of manufactured products have increased at a much slower rate than the overall inflation rate. Overall inflation has risen more than two and a half times more quickly than manufacturing prices. The huge difference in pricing power explains much of the reason why manufacturing has become a smaller part of the economy over the last decade.

The three largest manufacturing industries today are (in order): food products, computers and electronic products, and chemicals. Automobiles and auto parts dropped from third to fourth between 2002 and 2007, and fabricated metal products slipped from fourth to fifth in the same time period.

Manufacturing is the engine that drives American prosperity. It is central to our economic security and our national security. Federal Reserve Chair Ben Bernanke stated on February 28, 2007, "I would say that our economy needs machines and new factories and new buildings and so forth in order for us to have a strong and growing economy."

However, Franklin Vargo, vice president for international economic affairs of the National Association of Manufacturers, said, "If manufacturing production declines in the United States, at some point we will go below critical mass and then the center of innovation will shift outside

the country and that will really begin a decline in our living standards." While, manufacturing is not likely to fall below critical mass in this generation, it may in the next generation. Mark Zandi, chief economist at Moody's Economy.com calculates that 20.5 percent of the manufactured goods bought in American in 2005 were imported. This was up from 11.7 percent in 1992 and 20 percent in 2004. [3]

Manufacturing is Critical to our National Defense

Manufacturing ensures that the U.S. has a strong industry base to support its national security objectives. We need to preserve out national and homeland security to be able to produce the goods that allow us to defend America.

American manufacturers supply the military with the essentials needed to defend our country, including tanks, fighter jets, submarines, and other high-tech equipment. The same advances in technology that consumers take for granted support the military, particularly soldiers fighting overseas.

Kerri Houston, senior vice president for policy at the Institute for Liberty and a commission on the U.S.-China Economic and Security Review Commission, wrote, "If we are to retain our military superiority at home and abroad, we must maintain the ability to manufacture original equipment and replacement parts in the U.S. Needlessly sending defense jobs overseas will do nothing to ensure our long-term national security, which history shows will require a robust research and development, technical and manufacturing base."[4]

In a keynote address "Lessons for a Rapidly Changing World" at the CA World 2003, Dr. Henry Kissinger, former U.S. Secretary of State, said "The question really is whether America can remain a great power or a dominant power if it becomes primarily a service economy, and I doubt that. I think that a country has to have a major industrial base in order to play a significant role in the world. And I am concerned from that point of view." He added, "But if the outsourcing would continue to a point of stripping the U.S. of its industrial base and of the act of getting out its own technology, I think this requires some really careful thought and national policy probably can create incentives to prevent that from happening."[5]

Joe Muckerman, former Director, Emergency Planning and Mobilization, Office of the Secretary of Defense, wrote a guest editorial entitled "Without a Robust Industrial Base DOD Will Lose Future Wars" in the April 17, 2008 edition of *Manufacturing & Technology News*. He opined, "Joe Stalin said that World War II was not won on the battlefields of Europe but in Detroit. Had Stalin lived until the end of the Cold War, he probably would have arrived at a similar conclusion. The U.S. won the Cold War because it maintained technologically superior strategic weapons at a level that deterred the Soviet Union from attacking our vital interests. The United States was able to sustain this force for half a century during which the U.S. economy prospered while that of the USSR collapsed . . . Today the U.S. industrial base is fast becoming global and the U.S. economy is in trouble."

The U.S. cannot rely on other countries to supply its military because their interests may run counter to its own. America cannot risk being held hostage to foreign manufacturers when it comes to products that are essential for its national security and the U.S. military. It is crucial

that key components and technologies that are critical to the production of U.S. weapons and the related industrial capacity to produce such items be located within the United States.

Manufacturing Supplies Millions of Jobs

Many may not realize that while the U.S. has lost millions of jobs in manufacturing in the last 20 years, manufacturing jobs are still the foundation of the U.S. economy and the basis for its middle class. Manufacturing provides high-paying jobs for more than 14 million Americans and creates an additional eight million jobs in related industrial sectors. The five states with the largest manufacturing workforces are: California, Texas, Ohio, Illinois, and Pennsylvania. California's manufacturing workforce of more than 1.5 million is almost the size of the Texas and Illinois manufacturing workforce combined.[6]

Part of the loss of manufacturing jobs is due to increased productivity of American workers and automation. American workers achieve a high productivity rate year in and year out, increasing by more than 50 percent in the past decade. In the decade ahead, productivity growth will be the major source of economic growth, as more and more Baby Boomers leave the workforce to retire.

The growing trend of training in "lean manufacturing" is accelerating the increase in the productivity of American workers. For example, the metal stamping company that we represent went through lean manufacturing training in 2001, and as a result, the productivity per employee doubled and the time it takes for a part to go through the shop from the first work station to the last part went down from an average of four weeks to one day. In other words, a part goes from one stage of the manufacturing process to another (or one machine to another) without any delay.

Another trend is the domestic outsourcing of service jobs within a manufacturer, such as janitorial services, cafeteria/food services, accounting and payroll services, and legal departments. Thus, jobs that may have been classified as manufacturing are now classified as service jobs.

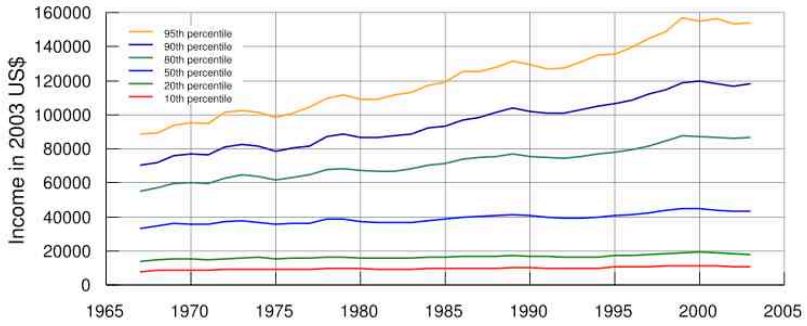
As companies get rid of business units and people that used to work for them, they get smaller. But as companies get smaller and more efficient, revenues go down but profits go up.

Manufacturing Jobs Pay Higher Wages than Service Jobs

Manufacturing wages and benefits are approximately 25 percent higher than in non-manufacturing jobs. Manufacturing compensation averages more than $65,000, compared to an average of $53,000 in the remainder of the economy.

Jobs paying $20 per hour that have historically enabled American wage earners to support a middle-class standard of living are leaving the U.S. Only 16 percent of today's workers earn the $20 per hour baseline wage, down 60 percent since 1979. Service and transportation jobs cease to exist in the absence of wealth – they exist and thrive as by-products of middle-class families buying products and services.[7]

As manufacturing jobs have declined over the past 40 years, the difference between the lowest personal income and highest personal income has steadily grown wider.



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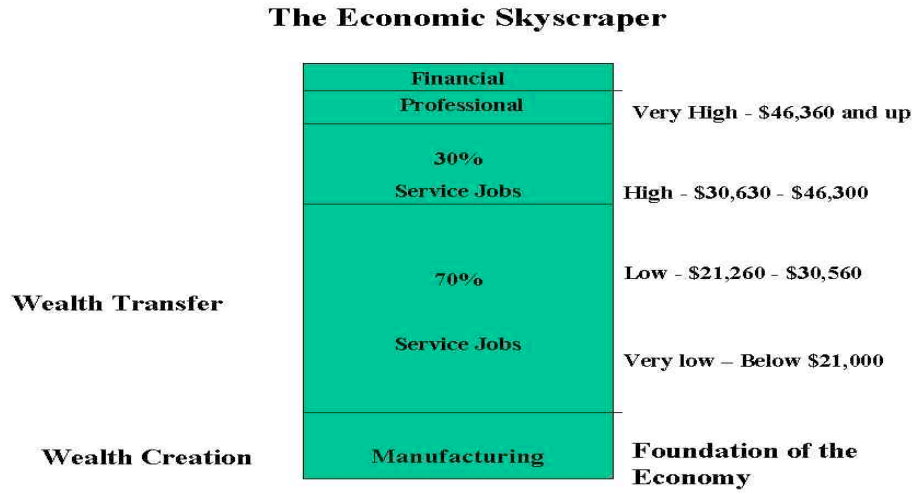
This difference is projected to get even worse according to the U.S. Department of Labor Occupational Outlook for 2006-2016. As the economic skyscraper graph below shows, the outlook is that 70 percent of the jobs created between 2006 and 2016 will be service jobs, paying low to very low wages.



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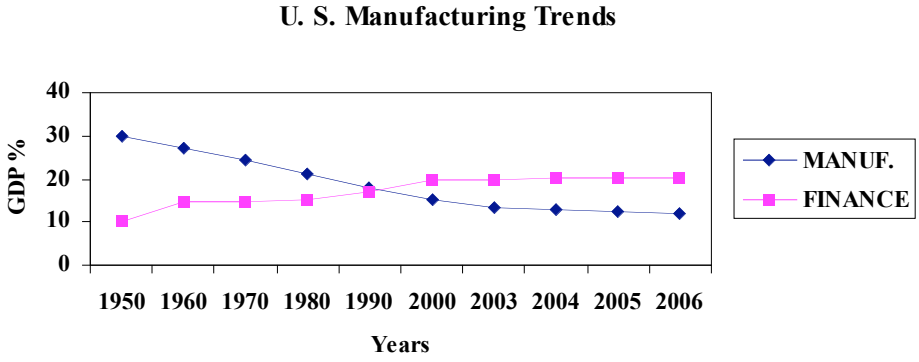
It is interesting to note that as the manufacturing percentage of our GDP declined in the United States, the percentage of our GDP produced by the finance sector increased. What's wrong with this picture is that a large share of the finance industry is based on speculation of assets such as stocks, bonds and real estate. Jobs in the finance industry are service jobs and don't pay as high an average wage except at the executive management or owner level.



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In contrast, the average salary for manufacturing management is $104,581 according to the *Industry Week*'s 2008 Salary Survey. By industry sector, the salary ranged from a low of $90,862 in the wood products/furniture sector to a high of $137,010 in the pharmaceuticals/healthcare sector.

"More manufacturing managers work in the metals industry (12 percent) than any other industry, followed by automotive/trans-portation manufacturers (10 percent) and industrial machinery producers (9 percent)."

The glass ceiling for women in manufacturing is still intact among the companies that responded to the *Industry Week* survey because 90 percent of managers are male making an average of nearly $28,000 more than female managers. While 92 percent of managers in the responding companies are White/Caucasian, it is interesting to note that their average salary is $105,566, while a Black/African-American manager's average salary is $112,309 and a Native American manager's average salary is $107,271. The average salary for a Hispanic/Latino is the lowest at $96,630. Seventy-one percent of managers are between the ages of 40 to 59, and 59 percent of managers have more than 21 years experience.[8]

Most people have no idea of the variety of jobs that are available at manufacturing companies. Besides the usual corporate/executive management jobs, some of the other management jobs available at medium to large manufacturers are in these areas: operations, plant/facilities, manufactur-ing/production, purchasing/procurement, sales/marketing, quality, supply chain, lean/continuous improvement, human resources, R&D/product development, and safety/ regulatory compliance.

Despite the challenges that the manufacturing industry has faced in the last several years, 83 percent of the people responding to the survey were either satisfied or very satisfied with manufacturing as a career path, and 74 percent were either satisfied or very satisfied with their current job.[9]

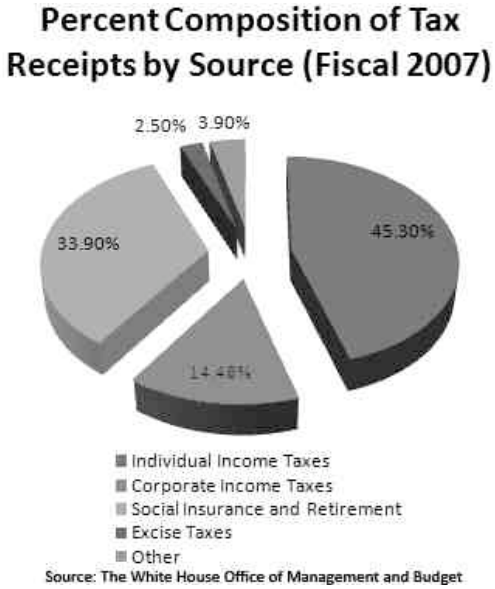
Actually, inside the modern manufacturing facilities in the United States, you will see the most productive, highly skilled labor force in the world applying the latest in information, innovation,

and technology. Contrary to popular opinion, the industrial age is not over. We are on the edge of incredible advances in manufacturing – from nanotechnology to lasers and biotechnology.

An important point to consider is that the decline in the higher paying jobs of the manufacturing industry may be making the Federal budget deficit worse. As we noted previously, a high percentage of manufacturers are unincorporated small businesses. Thus, the owners of these small businesses pay personal income taxes rather than corporate income taxes. As the U.S. loses more and more manufacturers, the amount of personal income tax receipts from these business owners goes down. In addition, the employees of these manufacturers are paid an average of 25 percent more than employees of other sectors of the U.S. economy. When manufacturing employees lose their jobs due to plant closures, less than half of those workers return to manufacturing jobs. When these employees do find new full-time jobs, they tend to take a pay cut. And if they are forced to take service jobs, they take a big pay cut. Thus, their individual tax payments go down also.[10]

As the manufacturing plants close, people lose the knowledge and memory of what manufacturing meant to their community. Decent-paying, entry-level jobs offering a future are replaced by menial, dead-end jobs. Our heritage of being makers and creators that made our country what it is today could be forgotten.

This becomes serious when you realize that nearly half of federal revenue comes from income taxes on individuals. The following breakdown from The White House Office of Management and Budget for 2007 shows that 45.3 percent of the government's total tax revenues came from individual income taxes. Taxes on social insurance and retirement taxes made up 33.9 percent, and corporate incomes taxes accounted for 14.4 percent.



The United States urgently needs to keep as many manufacturing jobs as possible so that the federal budget deficits don't go from bad to worse.

Manufacturing Creates Secondary Jobs

There is a multiplier effect of manufacturing jobs that reflects linkages that run deep into the economy. For example, every 100 steel or automotive jobs create between 400 and 500 new jobs in the rest of the economy. This contrasts with the retail sector, where every 100 jobs generates 94 new jobs elsewhere, and the personal and service sectors, where 100 jobs create 147 new jobs. In addition, each manufacturing dollar generates an additional $1.37 in economic activity.[11] It is manufacturers who hire services such as banking, finance, legal, and information technology.

Thus, this economic data indicates that each manufacturing job creates three to four other jobs, while service jobs only create one to two other jobs. Therefore, the loss of 3.2 million manufacturing jobs nationwide since the year 2000 may have caused more than ten million other jobs to vanish. The U.S. Department of Labor estimates that another 1.5 million manufacturing jobs will be lost between 2006 and 2016.[12] The University of California-Berkeley estimates that 14 million jobs are vulnerable to moving overseas in the next few years.[13]

Automation has helped keep American manufacturers not only competitive but the most productive in the world. Manufacturing has long led U.S. industries in productivity growth. Gains in productivity raise a country's standard of living. In the past 20 years, productivity – output per hour – has more than doubled – actually 2.5 times – that of other economic sectors.[14]

Manufacturing is the Engine of American Technology Development and Innovation

American manufacturers are responsible for more than two-thirds of all private sector R&D, which ultimately benefits other manufacturing and non-manufacturing activities. More than 90 percent of new patents derive from the manufacturing sector and the closely integrated engineering and technology-intensive services.

Manufacturing R&D is conducted in a wide array of industries and businesses of all sizes. The heaviest R&D expenditures take place in computers and electronics, transportation equipment, and chemicals (primarily pharmaceuticals.)

According to the 2008 annual survey conducted by the Industrial Research Institute (IRI), 38 percent of the companies responding said they plan to increase R&D spending by at least five percent this year. In addition, the largest industrial companies are planning to increase funding for basic research for the first time in a decade. "They also expect to increase spending on outside resources – through outsourcing R&D, licensing technology from others, funding university research, entering contracts with federal laboratories and increasing participation in alliances and joint R&D ventures."[15]

America's manufacturing innovation process leads to investments in equipment and people, to productivity gains, the spreading of beneficial technology to other sectors, and to new and improved products and processes. It is an intricate process that begins with R&D for new goods and improvements in existing products. As products are improved in speed, accuracy, ease of use, and quality, new manufacturing processes are utilized to increase productivity. Education

and training of employees is required to reap the benefits of such improvements in manufacturing processes.

Innovation is the hallmark of U.S. manufacturing, and it requires a certain mass of interconnected activities, which like a snowball rolling downhill, grows in size as it proceeds towards end users. Substantial R&D is required to keep the ball rolling to ensure more successes than failures.

Manufacturing is an incubator for technology and science, which require proximity to facilities where innovative ideas can be tested and worker feedback can fuel product innovation. Without this proximity, the science and technology jobs, like customer service jobs, follow the manufacturing jobs overseas.

The process through which R&D promotes economic prosperity is complex and multi-faceted. First, there are direct benefits to firms from their own R&D investments. Second, other companies derive benefits from the R&D of the innovating company in a "spillover" effect. Third, the feedback from R&D and its spillovers improves other products, processes, and distribution networks. Fourth, one industry's investment has a beneficial effect on other industries and the U.S. economy as a whole. "Spillover" effects are increased through sales transactions and knowledge transfers when the parties involved are interdependent and closer in geographic proximity.[16]

The maintenance of an effective U.S. R&D network is essential for attracting domestic and foreign R&D funds and the subsequent manufacturing that results from the innovation process, which increases U.S. value-added resulting in economic growth.

Consumers have benefited greatly from the large selection and quality of manufactured goods available as a result of the innovative new products resulting from R&D. U.S. consumers now have a dizzying array of products from which to choose. Quality improvements in manufactured goods have also reduced the frequency of repair and reduced the cost of operation.

This intricate process generates growth and higher living standards than any other economic sector. But, it requires a critical mass to generate this wealth. If the U.S. manufacturing base continues to shrink at its present rate, the critical mass will be lost. The manufacturing innovation process will shift to other global centers, and a decline in U.S. living standards will be the result.

Manufacturing Generates Exports

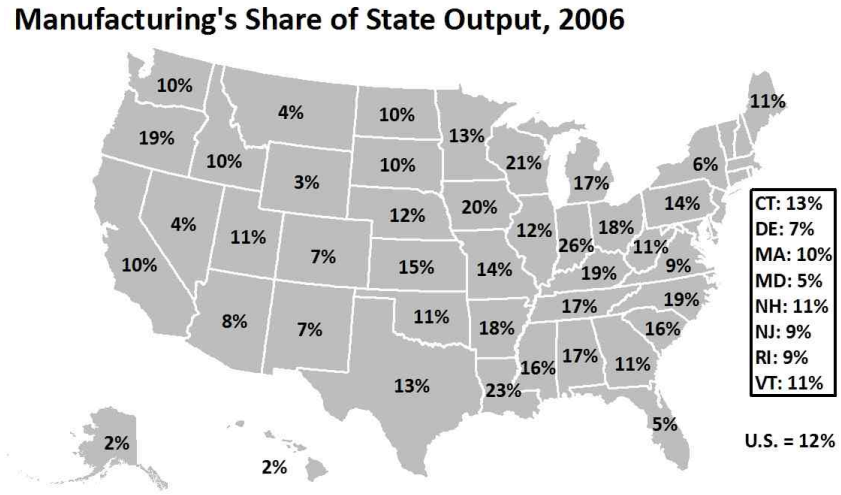
The United States is the world's second-largest exporter. Manufactured goods make up more than 60 percent of U.S. exports, double the level of ten years ago. While agricultural exports amount to about $50 billion a year, manufacturers export about that much each month.

High tech products are America's largest export sector ($220 billion); totaling 21 percent of total U.S. exported goods in 2006. The European Union was the top importer of these goods, followed by Canada, Mexico, and China.[17]

According to the U.S. Small Business Administration, small businesses comprised 97 percent of all U.S. direct exporters, generated 60 to 80 percent net new American jobs annually, and represented 29 percent of U.S. export value in 2006. About 65 percent of all U.S. exports came from small businesses with fewer than 20 employees.

Manufacturing Supports State Economies

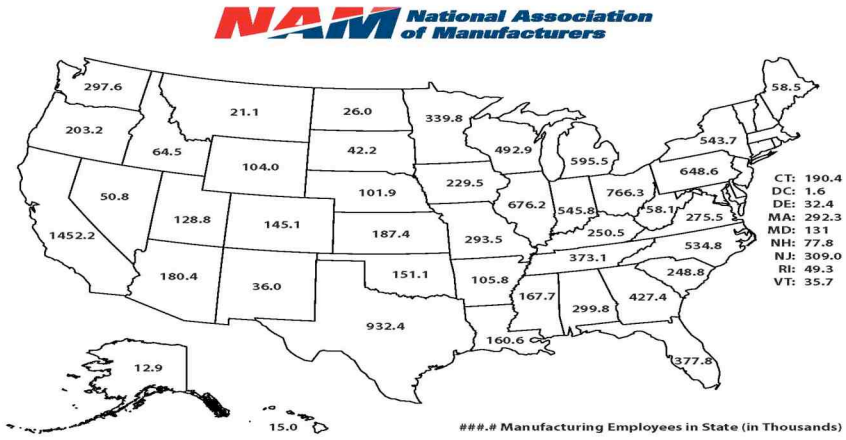
Manufacturing is a vital part of the economies of most states – even in those areas where manufacturing has declined as a portion of the Gross State Product (GSP). As a share of GSP, manufacturing was among the three largest private-industry sectors in all but ten states and the District of Columbia. Manufacturing is the largest sector in ten states and in the Midwest region as a whole. It is the second largest in nine states, and the third largest in 21 others.



Source: U.S. Bureau of Economic Analysis, Gross domestic product (GDP) by state

For the past decade, manufacturing corporations paid 30 to 34 percent of all corporate tax payments for state and local taxes, social security and payroll taxes, excise taxes, import and tariff duties, environmental taxes and license taxes.

Manufacturing is important for jobs and plays an important role in state economic growth. The states with the most manufacturing employees are: California, Texas, Ohio, Illinois, Michigan, and Pennsylvania.



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Manufacturing Affects Our Infrastructure

"Infrastructure" usually refers to the assets that support an economy, such as highways, streets, roads, bridges, dams, mass transit, airports, water supply water resources, wastewater management, electric power generation and transmission, telecommunications, flood management, and public recreational facilities. In the 1980s, the U.S. National Research Council committee adopted the term "public works infrastructure" because these various elements may collectively be termed public works, although they may be developed and operated as private sector or government enterprises. Economically, infrastructure could be seen to be the structural elements of an economy that allow for production of goods and services without themselves being part of the production process; for example, roads allow the transport of raw materials and finished products.[18]

Another meaning of infrastructure in information technology and on the Internet is the physical hardware used to interconnect computers and users. Infrastructure in this sense includes the transmission media, including telephone lines, cable television lines, satellites and antennas, and also the routers, aggregators, repeaters, and other devices that control transmission paths. Infrastructure also includes the software used to send, receive and manage the signals that are transmitted. To some information technology users, infrastructure is viewed as everything that supports the flow and processing of information.[19]

There is a particularly important link between manufacturing and the distribution networks: communications, transportation, utilities, and trade. These infrastructure networks are the vital link between the production of goods and services and their delivery to buyers. Such networks are much more capital-intensive than other service-producing industries, requiring capital and other manufactured goods to construct and maintain them. Thus the production of goods drives the demand for infrastructure, and the growth of infrastructure fuels the demand for manufacturers, creating synergies for investments in both sectors.

Manufacturers are providing the direct and substantial links to other economic sectors from mining and other raw-material-producing sectors to the transportation and trade sectors that are delivering the goods to end users and consumers. Manufacturers are building the equipment that

is used to build, implement, and maintain the public works infrastructure. As an example, building a bridge requires manufacturers to produce the cement, asphalt, steel beams, and fasteners that are used to construct the bridge.

Manufacturers also use the public works infrastructure, either internally in their manufacturing processes – such as gas and electricity provided by a municipal power plant – or externally, such as highways, streets, bridges, and airports to transport their manufactured goods.

Most products delivered by the major modes of transportation in the U.S. are tied to manufacturing. Manufactured products account for 87 percent of the value of goods and 70 percent of all ton-miles of products carried by trucks. These percentages are higher if you include the raw materials transported for use into the manufactured products.

It's easy to see the relationship between manufacturing and the infrastructure required for the information technology industry. Not only do manufacturers produce the hardware and software products used for this industry, but they also use the communications networks to increase efficiency. Manufacturers use the Internet for electronic interchange to process business transactions and utilize websites and online networks to market and sell their products.

Manufacturers need for and use of infrastructure makes it profitable for infrastructure producers to make investments to improve the infrastructure, but these improvements provide benefits to everyone.

In summary, manufacturing is the foundation of the U.S. national economy and the foundation of the country's large middle class. Losing the critical mass of the manufacturing base will result in larger state and federal budget deficits and a decline in U.S. living standards. This, in turn, will result in the loss of a large portion of our middle class, which depends on manufacturing jobs. America's national defense will be in danger, and it will be difficult, if not impossible to maintain the country's position as the world's super power.

It will take cooperative efforts on the part of industry, government, and individual Americans to ensure that American manufacturing survives and grows in the global economy.
