

## **APPENDIX A**

### **National Employment and Income Effects From a Shift in Federal Priorities**

by Greg Bischak, Ph D.

Unmet national infrastructure needs have been detailed by the American Society of Civil Engineers (ASCE) in a September 2003 report. This assessment outlines the ASCE's estimate of the projected five-year deficits in America's public infrastructure investments in highways, bridges, transit, schools, aviation, drinking water and waste water infrastructure, solid waste, hazardous waste, waterways and the electrical transmission grid.<sup>1</sup>

Current baseline funding in the federal budget<sup>2</sup> was deducted from each one of the ASCE estimates to determine a net annual estimate of additional funding required over the 2005 – 2009 period. This exercise resulted in a projected annual average estimate of \$269 billion required to meet these infrastructure needs over this period (which averaged \$222 billion when expressed in fixed 1996 dollars).

Four methods were used to estimate the economic and employment impacts of such a hypothetical five-year civilian investment program. All simulations were performed using a dynamic national economic model of the economy.<sup>3</sup> The employment estimates generated by this model represent the additional employment over the existing forecast and include the direct, indirect and induced effects of these investment impacts. The estimated changes in Gross Domestic Product and Personal Income represent the effects on final demand in the economy from this additional investment.

First, a simulation was performed using a hypothetical shift in federal spending from the military to the civilian budget so that no new fiscal burden would be imposed on the domestic economy. This method simulated cuts by nearly half of projected annual military spending for the 2005 to 2009 period, and the investment of the savings into the infrastructure program detailed above.

Second, a shift identical to the first method was modeled, but monetary market adjustments were introduced mid way through the five-year period to reflect the upward pressure on interest rates from additional public borrowing.

Third, a simulation was performed of the impacts of funding the infrastructure investment program through additional public investment without a compensating shift of funding from the military to civilian federal budget. These impacts were modeled without introducing any monetary market adjustment.

Fourth, a simulation was performed of the impacts of funding the infrastructure investment program by injecting additional funds into the economy without a compensating shift of funding from the military to civilian federal budget. However, under this scenario a monetary market adjustment was introduced mid way through the five-year period to reflect the upward pressure on interest rates from additional public borrowing.

The results of these four simulations are presented in the table below.

It is noteworthy that simply shifting federal spending from the military to fund the civilian infrastructure program generates net job creation—even though no new public funds are injected into the national economy. Annual average job impacts of such a shift in federal priorities range from 988,000 jobs (assuming no monetary adjustment), to 593,000 jobs (with monetary adjustment). A hypothetical injection of additional spending into the national economy to fund the public infrastructure program (without a compensating shift of federal spending from military to civilian priorities) generates job estimates that range from a high of 4.7 million jobs to nearly 2.7 million once some monetary adjustment is introduced.

Several factors account for the increase in economic activity under the shifting priorities scenarios. First, civilian infrastructure programs generally purchase a greater share of domestically produced goods and services. Second, the sectors stimulated by civilian infrastructure spending are relatively less capital-intensive than military spending. Third, a significant share of military spending goes to troops stationed overseas and to support logistics operations overseas, with a large proportion of the spending leaking out to overseas consumption, suppliers and businesses. Finally, it is important to note that all of these estimates only reflect the short-term impacts of these changes, and do not measure the long-term productivity benefits that would occur from these civilian infrastructure investments.

**Results of Four Simulations of Hypothetical Federal Spending Scenarios 2005-2009**

	2005	2006	2007	2008	2009	5-yr average
Additional Employment (Thousands)	1,375	1,119	943	808	697	988
Gross Domestic Product (Billions of Fixed 96\$)	62	49	41	35	30	44
Personal Income (Billions of Nominal \$s)	130	137	141	143	144	139
	2005	2006	2007	2008	2009	5-yr average
Additional Employment (Thousands)	1,375	1,119	472	0	0	593
Gross Domestic Product (Billions of Fixed 96\$)	62	49	6	-28	-27	13
Personal Income (Billions of Nominal \$s)	130	137	111	89	93	112
	2005	2006	2007	2008	2009	5-yr average
Additional Employment (Thousands)	5,951	5,069	4,531	4,143	3,836	4,706
Gross Domestic Product (Billions of Fixed 96\$)	376	329	301	281	266	311
Personal Income	409	420	422	424	424	420

(Billions of Nominal \$s)						
	2005	2006	2007	2008	2009	5-yr average
Additional Employment (Thousands)	5,951	5,069	2,266	0	0	2,657
Gross Domestic Product (Billions of Fixed 96\$)	360	314	126	-38	-45	143
Personal Income (Billions of Nominal \$s)	376	329	132	-40	-48	150

### **DR. GREG BISCHAK**

Greg Bischak is a Senior Economist for the Appalachian Regional Commission (ARC). He conducts and directs research on the various aspects of the economic development needs and programs of the thirteen state Appalachian region.

Dr. Bischak received his doctorate from the New School for Social Research in New York City in 1988. He is a member of the Transportation Research Board of the National Academy of Science, and serves on the Transportation and Development Committee. His areas of expertise are regional economics, input-output analysis, industrial organization and transportation and energy economics.

Dr. Bischak's publications include "Issues for Examining the Economic Development Impacts Using a Fully Networked Model of the Appalachian Development Highway System Progress" Transportation Research Board, May 2002; "Challenges in Reducing Economic Distress in Appalachia, An Analysis of National and Regional Trends Since 1960; *US Conversion after the Cold War, 1990-1997: Lessons for Forging a New Conversion Policy*, July, 1997, Bonn International Center for Conversion, Bonn, Germany. A more complete bio of Dr. Bischak can be found at: <http://faculty.fuqua.duke.edu/ciber/nftp/bischak.htm>

## APPENDIX B

### The American Society of Civil Engineers' 2003 Progress Report

In March 2001, ASCE released a Report Card for America's Infrastructure, grading 12 infrastructure categories at a discouraging D+ overall and estimating the need for a \$1.3 trillion investment to bring conditions to acceptable levels. In Sept. 2003, ASCE released a Progress Report that examines the current trends for addressing the nation's deteriorating infrastructure and discusses actions the federal government should take to bring conditions up to acceptable levels. ASCE did not issue new grades because the condition and performance have not changed significantly in two years.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Roads & Bridges	D+/C	↓/↔

The nation is failing to even maintain the substandard conditions we currently have, a dangerous trend that is affecting highway safety, as well as the health of the economy. According to the Federal Highway Administration's (FHWA) "2003 Conditions and Performance Report," traffic congestion costs the economy \$67.5 billion annually in lost productivity and wasted fuel. Passenger and commercial travel on our highways continues to increase dramatically. The average rush hour grew more than 18 minutes between 1997 and 2000. The American Association of State Highway and Transportation Officials' (AASHTO) "Bottom Line Report" estimates that capital outlays by all levels of government would have to increase by 42% to reach the projected \$92 billion Cost to Maintain level, and by 94% to reach the \$125.6 billion Cost to Improve level. This is in contrast to the FHWA which estimates that outlays by all levels of government would have to increase by 17.5% to reach their projected \$75.9 billion Cost to Maintain level, and 65.3% to reach their \$106.9 billion Cost to Improve level.

As of 2000, 27.5% of the nation's bridges (162,000) were structurally deficient or functionally obsolete, an improvement from 29% in 1998. A structurally deficient bridge is closed or restricted to light vehicles because of its deteriorated structural components, which require speed and weight restrictions. A functionally obsolete bridge has older design features and while it is not unsafe for all vehicles, it cannot safely accommodate current traffic volumes, vehicle sizes and weights. These restrictions not only contribute to traffic congestion, they also pose major inconveniences such as in Warren, Pa., where the local hospital has stationed an ambulance crew on the other side of town to avoid a time-consuming three-mile detour around the Hickory Street Bridge while the town awaits construction of a new \$10-million span. It is estimated that it will cost \$9.4 billion a year for 20 years to eliminate all bridge deficiencies. Present funding trends of state DOTs call into question future progress on addressing bridge deficiencies.

While the enactment of the Transportation Equity Act of the 21st Century (TEA-21), which authorized \$218 billion for the nation's highway and transit programs in 2001, has helped, America continues to shortchange funding for much needed road and bridge repairs.

**FEDERAL ACTION NEEDED:** On Sept. 30, 2003, TEA-21 expires, along with funding to state highway and transit programs. Congress and the Administration must act to reauthorize this important legislation with sufficient funding to address the significant needs identified for America's surface transportation systems. The House Transportation and Infrastructure Committee's draft TEA-21 proposal provides \$375 billion over 6 years for the

nation’s surface transportation program – the amount identified as the Cost to Maintain by the FHwA in the 2002 Conditions and Performance Report.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Transit	C-	↓

Despite increased spending resulting from TEA-21, our transit systems show signs of decline. Efforts to maintain the systems are outpaced by growth in ridership, which has increased faster than airline or highway transportation. According to the American Public Transit Association, public transportation ridership has increased 22% since 1998 – the highest level in 40 years.

Roads and transit systems are in peril. Funding at the federal, state and local levels is in danger of drying up and citizens are failing to invest in their communities’ futures. In Virginia, where vehicle travel has increased by 21% from 1991 to 2001 and its population grew by 16% between 1990 and 2001, voters in Northern Virginia and Hampton Roads, Va., failed to pass a sales tax proposal last fall that would have raised billions for its overburdened road and transit system. On the positive side, in Las Vegas, where freeway congestion has grown from 5% to 55% in the past 20 years, voters approved a tax plan to fund local transportation projects.

The federal government invests \$7.66 billion annually in mass transit capital improvements. According to AASHTO, capital outlays by all governments would have to double to reach the projected \$18.9 billion Cost to Maintain level, and increase by 362% to reach the \$43.9 billion Cost to Improve level. The Federal Transit Administration estimates the Cost to Maintain at \$14.8 billion and the Cost to Improve at \$20.6 billion.

**FEDERAL ACTION NEEDED:** On Sept. 30, 2003, TEA-21 expires, along with funding to the nation’s surface transportation programs. Congress and the Administration must act to reauthorize this important legislation with sufficient funding to address the significant needs identified for America’s surface transportation systems.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Aviation	D	↔

Despite economic and post 9/11 related decline in passenger travel, the FAA expects dramatic growth in aviation demand over the next decade. Total U.S. enplanements in 2001 were 683 million and are expected to reach 1 billion by 2014. Air cargo is expected to grow by 5.3% a year for the next 12 years. The FAA states that a minimum of an additional \$2 billion a year is necessary to meet needs.

When aviation infrastructure was graded a D in 2001, airport capacity had increased only 1% from 1991 to 2001, yet air traffic had increased 35% during that same period. Despite the current lows in passenger travel, the continued resurgence in passenger and cargo air travel to previous levels, combined with current airport spending trends, translates into a “No Progress” arrow for our nation’s aviation infrastructure. Little is being done to capitalize on the low growth period after 9/11 to address the nation’s aviation infrastructure needs.

Officials are choosing to invest funds in strengthening airline security measures instead of infrastructure. Los Angeles Mayor James K. Hahn’s recently proposed a \$9 billion plan for

Los Angeles International Airport would enhance security, in part by decreasing the number of gates from 163 to 153, but allows for no significant airfield capacity increases.

**FEDERAL ACTION NEEDED:** On Sept. 30, 2003, AIR-21 expires, along with funding for programs such as the Airport Improvement Program (AIP). Both the House and Senate have passed versions of the Second Century of Flight Act (H.R. 2271 & S. 788); however, Congress and the Administration must work out their differences to allow President Bush to sign into law an airport bill.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Schools	D-	↔

Due to either aging, outdated facilities, severe overcrowding, or new mandated class sizes, 75% of our nation's school buildings remain inadequate to meet the needs of school children. The average cost of capital investment needed is \$3,800 per student, more than half the average cost to educate a student for one year. Population growth is outpacing investment in our schools. While school construction spending has increased, the cost to remedy the situation remains more than \$127 billion.

Many school districts are mandating a lower student to teacher ratio in an effort to improve test scores. In Florida, there is now a statewide constitutional amendment limiting class sizes causing the Hillsborough County school district to put a freeze on moving dilapidated portable classrooms from school property.

There has been no new comprehensive needs assessment since the last report card. The increased attention on K-12, along with increased funding, has highlighted the issue, but the underlying problems remain.

**FEDERAL ACTION NEEDED:** Funding for schools is a state and local function. However, federal educational standards and mandates on classroom size do have costs. The federal government should do more to assist local school districts in maintaining their facilities. One way would be to enact the America's Better Classroom Act of 2003 (H.R. 930 & S. 856), which would help states and localities by using tax credits to pay the interest on school modernization bonds. It is a sensible, cost-effective and efficient measure that creates no new bureaucracy

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Drinking Water	D	↓

While drinking water quality remains good, the infrastructure of the nation's 54,000 drinking water systems is aging rapidly. Federal funding remains flat, while the infrastructure needs continue to increase. There is an annual shortfall of \$11 billion needed to replace or rehabilitate facilities that are nearing the end of their useful life and to comply with federal water regulations.

The forecast for our nation's drinking water systems indicates a downward slope. Drinking water received a D on the 2001 Report Card, yet the situation continues to worsen as aging systems – some developed more than a century ago – continue to service our ever-growing population.

**FEDERAL ACTION NEEDED:** Reauthorization of the Safe Drinking Water Act at \$25 billion over a five-year period would go a long way toward improving our nation’s water infrastructure.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Wastewater	D	↓

The nation’s 16,000 wastewater systems face enormous needs. Some sewer systems are 100 years old and many treatment facilities are past their recommended life expectancy. Currently, there is a \$12 billion annual shortfall in funding for infrastructure needs; however, federal funding has remained flat for a decade. Because of this continuing shortfall, more than 1/3 of U.S. surface waters do not meet water quality standards.

America’s farmers, fishermen, manufacturers and tourism industries rely on clean water to carry out activities that contribute over \$300 billion to our economy each year. However, the challenge to continue providing clean water remains, as our existing national wastewater infrastructure is aging, deteriorating and in need of repair, replacement and upgrading. In fact, EPA has reported that without improvements to the nation’s wastewater treatment infrastructure, we face the very real risk of losing the environmental gains we have achieved over the last three decades since the passage of the Clean Water Act of 1972.

**FEDERAL ACTION NEEDED:** Reauthorization of the Clean Water Act at \$25 billion over a five-year period would begin to improve our nation’s wastewater infrastructure. Congress should pass H.R. 1560, the Water Quality Financing Act of 2003, or S. 170, the Clean Water Infrastructure Financing Act of 2003, at the recommended funding level.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Dams	D	↓

The number of unsafe dams has risen by 23% to nearly 2,600. Because of downstream development, the number of “high-hazard potential dams” – those whose failure would cause loss of life – has increased from 9,921 in 2001 to 10,049 in 2003. There have been 21 dam failures in the past two years.

Some progress is being made through the repair of small watershed dams constructed with assistance from the USDA since 1948. This is only a small portion of the total number of non-federal dams. On the federal side, the federally-owned dams are in good condition; however, continuing budget restrictions are placing pressure on and limiting many agency dam safety programs.

Despite the recent passage of the National Dam Safety and Security Act of 2002 (HR 4727), which provides funding through grants to improve state dam safety programs, it is estimated that \$10.1 billion is needed over the next 12 years to address all critical non-federal dams – dams that pose a direct risk to human life should they fail. In the meantime, the 78,000 dams in the U.S. National Inventory of Dams continue to age and deteriorate.

**FEDERAL ACTION NEEDED:** Introduction and passage of legislation to create a loan fund for the repair, rehabilitation and removal of non-federal dams would provide seed money to advance the process of rehabilitating the most critical dams.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Solid Waste	C+	↔

The amount of solid waste sent to landfills has declined 13% since 1990, while the amount of waste recovered through recycling has nearly doubled and waste-to-energy plants manage now 17% of the nation's trash. Most states have 10 years' worth of landfill capacity.

Solid waste disposal received a C+, the highest grade on the 2001 Report Card for America's Infrastructure. In the two years since, solid waste is holding steady with average performance. Sanitary land filling in the United States has made monumental strides in the last 20 years, moving from open dumps with little or no control to "state of the art" facilities with sophisticated containment systems, environmental monitoring, improved operational practices and increased regulation. The amount of solid waste sent to landfills has declined by 13%, while the amount of waste recovered through recycling has nearly doubled, an option that many municipalities, including the city of New York, have found to be cost effective.

However, despite the progress with traditional solid waste concerns, the rapid development of new technology has created an electronic waste stream (computer hardware and other electronic components) that, according to the U.S. Environmental Protection Agency (EPA), currently accounts for 1% of the nation's 210 million tons of solid waste each year and is growing rapidly. Because of a lack of an efficient, U.S.-based management system for this new waste category, much of our nation's electronic waste is being stockpiled or sent overseas for disposal.

**FEDERAL ACTION NEEDED:** An efficient management system based in the United States is needed to handle the growing volume of electronic waste (e-waste). Congress should authorize regional e-waste management compacts to assist states in managing this emerging solid waste concern.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Hazardous Waste	D+	↔

Since 2001, brownfields redevelopment has increased, with the restoration of 922 sites resulting in increased tax revenue and jobs. The rate of Superfund site clean-up has quickened. Unfortunately, in both arenas, the clean-up rate is not able to keep up with the rate at which new sites are identified and the backlog of potential sites is assessed.

According to a June 2003 report from the U.S. Conference of Mayors, 205 cities have 24,987 brownfield sites awaiting redevelopment. Of those, 148 cities reported that 576,373 new jobs and as much as \$1.9 billion annually could be generated if their brownfield sites were redeveloped. The Government Accounting Office (GAO) estimates that there are 400,000 to 600,000 brownfield sites nationwide.

Nearly 10,000 contaminated sites could end up in the Superfund program. Nearly 800 high-priority hazardous-waste sites were fully cleaned up between 1980 and 2000. However, more than 1,200 sites remain to be addressed and another 3,000 sites still need to be assessed for possible action under Superfund. The Superfund program could encompass as many as 10,000 contaminated sites. The U.S. GAO estimates that, after nearly 20 years and outlays of more than \$14 billion, the Superfund program has yet to complete clean-ups for 42% of the nation's most severely contaminated hazardous waste sites. Cleanups at 85% of these sites

will be completed by the end of calendar year 2008. The remainder will not be completed until well after 2008.

**FEDERAL ACTION NEEDED:** The Bush administration has asked Congress to add \$150 million to next year's Superfund program budget, which averages \$3 billion a year. Yet with so many brownfields waiting to be decontaminated and rehabilitated, prime economic opportunities continue to languish. Congress should enact H.R. 239, the Brownfields Redevelopment Enhancement Act; H.R. 402, the Brownfield Cleanup Enhancement Act of 2003; H.R. 2535, the Economic Development Administration Reauthorization Act of 2003; and S. 645, the Brownfields Redevelopment Assistance Act of 2003.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Navigable Waterways	D+	↓

As the world's leading maritime and trading nation, the United States relies on an efficient and effective marine transport system to maintain its role as a global economic superpower. The waterway system is also vital to U.S. national security interests. The nation's 25,000 miles of waterways, 238 lock chambers and 1,000 harbor channels serve 300 U.S. ports and over 3,700 terminals by moving 2.4 billion tons of commerce annually, and by providing critical intermodal links to 152,000 miles of rail; 460,000 miles of pipelines; and 45,000 miles of interstate highways. Despite the significance of the waterway link to the global economy, national investment in water resources projects has not kept pace with U.S. economic and social expansion, resulting in the nation's waterway infrastructure being in urgent need of modernization to accommodate present and future levels of waterborne traffic.

Half of the navigation locks on inland waterways exceed their 50-year design life. System capacity has been impacted by deferred maintenance, which has led to a doubling of out-of-service times at navigation locks over the last 10 years. Funding shortfalls have delayed completion of many ongoing capital improvement projects by 5 to 10 years, resulting in construction cost increases of \$300 million and lost benefits of over \$2 billion. The unexpended balance in the Inland Waterway Trust Fund has grown to \$360 million.

Additionally, key deep-draft channels at the nation's gateway ports are inadequate for the mega-container ships, which are the world standard for international trade, and intermodal connectors to ports are in poor condition. Transportation demand through navigation channels, especially for vessels carrying containerized cargoes, is expected to more than double by the year 2020. Maintaining authorized levels of service at harbor channels is challenged by a growing maintenance funding backlog, with the unexpended balance in the Harbor Maintenance Trust Fund now at \$1.73 billion.

Over the last 30 years the U.S. population has increased more than 40% while the GDP has grown from \$2.5 to \$10.8 trillion. Meanwhile, capital investment in public water resources infrastructure has decreased by 70%. For example, in the 1970s the U.S. Army Corps of Engineers' civil works construction appropriations were in the \$4 billion range. However, in the 1990s the funding dropped to an average of \$1.6 billion a year. The combination of declining investment, coupled with an expanding population and economy, has created an "investment gap."

**FEDERAL ACTION NEEDED:** A bi-annual water resources authorization act was not enacted in 2002, postponing needed environmental and business process improvements for waterway programs. It is imperative that Congress and the Administration pass the Water Resources Development Act of 2003 (H.R. 2557) to address these future needs. In addition,

the investment gap needs to be addressed through aggressive modernization and maintenance programs, including spending down the trust fund balances for the purposes the monies were intended.

<i>Subject</i>	<i>Grade</i>	<i>Trends</i>
Energy	D+	↓

Over the last two decades, transmission investment has decreased by \$115 million a year, dropping from \$5 billion annually in 1975 to \$2 billion in 2000. The electric transmission line grid capacity has not been upgraded to meet growth demands.

In August 2003, millions of Americans and Canadians were left without electricity. Two years after the nation's energy infrastructure received a D+, the nation experienced an electrical system failure that not only left tens of millions in the dark, but also brought other infrastructure areas to a halt. Transit in New York City was stopped in its tracks leaving millions stranded and access to drinking water in Cleveland was interrupted.

Since 1990, actual capacity has increased by only about 7,000 megawatts (MW) per year, an annual shortfall of 30%. More than 10,000 MW of capacity will have to be added each year until 2008 to keep up with the 1.8% annual growth in demand. The U.S. energy transmission infrastructure relies on older technology, raising questions of long-term reliability.

Proposals to build more generators and adding transmission lines are often met with serious obstacles, including voter opposition. The Department of Energy estimates that consumers will pay up to \$50 billion in higher electric bills to modernize the U.S. power grid. Still, government has been slow to adopt regulations to improve transmission capacity.

**FEDERAL ACTION NEEDED:** Investments in the transmission grid have diminished significantly in recent years. Investment barriers include lack of regional integrated planning, difficulty in siting new transmission lines, and uncertainty regarding investment risks and returns. The Federal Energy Regulatory Commission (FERC) has called for the development of five Regional Transmission Organizations (RTOs). These RTOs, when implemented, will be used to better determine weaknesses in the transmission grid and allow better regional planning. The RTOs will ultimately be responsible for the efficient managed growth of the regional transmission system.

Bottom Line — All Categories	2001 GPA
Total Investment Needs: \$1.6 Trillion <i>(estimated 5-year need)</i>	D+

A= Exceptional B = Good C = Mediocre D = Poor F = Inadequate	Trends ↑ = Improving ↔ = No Progress ↓ = Declining	Each category was evaluated on the basis of condition and performance, capacity vs. need, and funding vs. need. Assessments do not include security enhancements as no authoritative data is available
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Each category was evaluated on the basis of condition and performance, capacity vs. need, and funding vs. need. Assessments do not include security enhancements as no authoritative data is available.

In 2001, the estimated cost for infrastructure renewal was \$1.3 trillion over a five-year period. Today, that cost has risen to \$1.6 trillion over a five-year period. While solutions to repair our crumbling infrastructure can be addressed through a renewed partnership between citizens, the private sector, and local, state and federal governments, reauthorization of TEA-21, and passage of the Clean Water Act and the Safe Drinking Water Act can provide critical funding to repair our transportation, water and dam infrastructure.

The trends for renewal of the 12 infrastructure areas were assessed by a panel comprised of 20 eminent civil engineers representing the broad spectrum of civil engineering. The forecasted trends were based on the condition and performance of each infrastructure area as reported by federal sources; capacity of infrastructure versus need; and current and pending investment of state, local and federal funding for infrastructure versus need.

## **APPENDIX C**

### **Selected Excerpts From the Section 301 Petition**

From the American Federation of Labor and Congress of Industrial Organizations, (AFL-CIO) Before the Office of the United States Trade Representative, March 2004, From John J. Sweeney (President, AFL-CIO) and Richard L. Trumka (Secretary-Treasurer, AFL-CIO), with Counsel: Mark Barenberg, Professor of Law, Columbia University, 435 W 116<sup>th</sup> St., New York, NY 10027. This petition requests that action be taken under Section 301 of the Trade Act of 1974, as amended.\*

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### **SECTION 301 PETITION**

#### **I. INTRODUCTION AND SUMMARY**

Each year, millions of Chinese citizens travel from impoverished inland villages to take their first industrial jobs in China's export factories. Young and mostly female, they are sent by their parents in search of wages to supplement their families' income. They join an enormous submerged caste of temporary factory workers who are stripped of civil and political rights by China's system of internal passport controls.

They enter the factory system, and often step into a nightmare of twelve-hour to eighteen-hour work days with no day of rest, earning meager wages that may be withheld or unpaid altogether. The factories are sweltering, dusty, and damp. Workers are fully exposed to chemical toxins and hazardous machines, and suffer sickness, disfiguration, and death at the highest rates in world history. They live in cramped cement-block dormitories, up to twenty to a room, without privacy. They face militaristic regimentation, surveillance, and physical abuse by supervisors during their long day of work and by private police forces during their short night of recuperation in the dormitories.

They can do little to relieve their misery. Their movements are controlled by the Public Security forces, who ruthlessly enforce the pass system. They are not permitted to seek better-paying jobs reserved for privileged urban residents. If they assert their rights, they are sent back to the countryside, or worse. Attempts to organize unions or to strike are met with summary detention, long-term imprisonment, and torture. Enmeshed in bonded labor, they frequently cannot even leave their factory jobs, no matter how abusive. They have minimal access to China's legal system, which, in any event, is corrupted by the local Party officials who extract personal wealth from factory revenue. Their impotence is reflected in their desperate acts of violence and their shocking rate of suicides intended merely to draw attention to their plight. China's unremitting repression of labor rights robs China's workers of wages, health, and dignity.

By lowering wages by between 47 and 85 percent, China's labor repression also diverts millions of manufacturing jobs from countries where labor rights are not so comprehensively denied, increasing unemployment and poverty among workers in developed and developing countries. Highly conservative methodologies show that China's labor repression displaces approximately 727,000 manufacturing jobs in the United States alone, and perhaps many more.

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\* The full text of the petition is available at:

[www.aflcio.org/issuespolitics/globaleconomy/upload/china\\_petition.pdf](http://www.aflcio.org/issuespolitics/globaleconomy/upload/china_petition.pdf)

China's current level of investment in new factories is unprecedented and will deliver an even greater supply shock to global industry in the next five years, producing even greater losses in U.S. manufacturing jobs -- unless the President takes decisive action. Developing countries such as Bangladesh and Indonesia will each lose up to one million manufacturing jobs to China, and Central American and the Caribbean will lose up to one half million jobs, in the textile and apparel sector alone. Workers in all countries have a common interest in safeguarding the human rights of China's factory workers.

This petition is not targeted against "free trade" or against China's "comparative advantage" in global markets. Rather, this petition challenges the *artificial* and *severe* reduction of China's labor costs below the baseline of comparative advantage defined by standard trade theory. China reduces labor costs by a system of government-engineered labor exploitation on a scale that is unmatched in the present global economy. As this petition details, China's comprehensive regimentation of its young migrant factory workers has some elements that are similar to the control of black workers in apartheid-era South Africa. Both systems use internal pass controls that prevent workers from moving their permanent residence from impoverished villages to factory towns and cities. Both systems subject temporary migrant workers to extreme deprivation of their workplace rights. Both systems turn ordinary workers into highly exploitable outcasts in their own country...

p. 6

... Like the discredited laissez-faire regimes of the nineteenth century, today's global rules protect rights of property, contract, and capital but not fundamental rights of personhood, community, and labor. Section 301(d) embodies an alternative model, in which human and social rights are the necessary precondition to democratic and equitable development. Consistent with that model, section 301(b) authorizes the President not only to take trade action to improve China's immediate labor-rights practices. It also authorizes him to take any action within his foreign-affairs power to change the rules of trade and finance that encourage China's violations. ...

p. 10

... Petitions under sections 301 and 302 are typically filed by U.S. corporations seeking to protect their commercial interests against unfair trade practices by foreign governments. Those unfair trade practices include barriers to imports from the U.S., subsidies of exports to the U.S., failure to enforce the intellectual property rights of U.S. companies, and many others.

The workers' rights provisions of section 301 are distinctive in several ways. First, unlike other unfair trade practices enumerated in section 301, the workers' rights provisions are aimed at safeguarding fundamental human rights. That aim cannot be dismissed as "protectionist". The goal of those provisions, and of this petition, is not to deny jobs and economic advancement to China's workers. To the contrary. The goal is to use the enormous economic leverage of the United States to induce positive change in China - to achieve respect for the basic rights of China's factory workers. When China safeguards basic workers' rights, it will enjoy access to the U.S. market *and* create jobs that are not an affront to human dignity. ...

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... There are more than 750 million workers in China -- more than the workforce of all OECD countries combined. China's 2002 census showed approximately 160 million in

manufacturing and mining, nearly 12 times the manufacturing workforce in the United States. China's manufacturing workers are employed in several different types of enterprises - privately invested enterprises (PIEs), joint-ventures, foreign-invested enterprises (FIEs), urban collectives and cooperatives, township and village enterprises (TVEs), and state-owned enterprises (SOEs).

To the extent that the Western media and public have any knowledge of these enterprises, they may be most familiar with images of large showcase factories owned by Western multinational corporations that have come under pressure from consumer and labor activists. But the vast majority of export workers labor in other facilities, out of public view, producing either directly for export or as subcontractors for larger export enterprises.

Large concentrations of manufacturing enterprises are located in the well-known coastal export regions of the Pearl River Delta (Guangdong) and Yangtze River Delta (Shanghai and Jiangsu). But literally hundreds of towns and cities throughout China have declared themselves export zones. Local officials compete for investment. They benefit personally by extracting revenue from enterprises and workers. China has approximately 780 million peasants. Between 180 and 350 million are estimated to be "excessive" or in "dire poverty" and available for urban employment.

Ten to twenty million will enter the nonagricultural workforce each year during the next two decades. That is, *every year*, China will add more nonagricultural workers than the *total* manufacturing workforce of the United States. In the next three to five years, China will add more workers to its urban workforce than the total manufacturing workforce of the U.S., the E.U, and Japan combined....

p. 15

Equally important, workers are not allocated to China's factories by a competitive market. China enforces internal passport controls that create an enormous, submerged caste of exploitable factory workers who are temporary migrants from the countryside.

The Chinese system is not formally based on racial differences, but in practice migrant workers are distinguished by dialect and ethnicity; and the privileged class of permanent urban residents in fact treats migrant workers from the countryside as an ethnically inferior sub-caste. ...

p. 17

First, China's manufacturing workers are not permitted to organize independent unions to defend their basic rights and raise their wages. They are not permitted to strike. The full force of state terror - beatings, imprisonment, psychiatric internment, and torture -- is deployed against workers' attempts to exercise their right of association.

Second, the internal passport system denies migrant workers other basic civil and social rights in their temporary urban life, further suppressing their bargaining power and wages. Managers and local officials extract fees and deposits from newly arriving migrant workers and threaten them with even more severe penalties if they quit, enmeshing workers in a system of bonded labor. They are expelled and relocated to the countryside when they are no longer needed in the factory, when they are injured or sickened, or when they seek to assert their labor rights. Local officials in exporting areas compete for investment and, legally or corruptly, extract personal wealth from both state and private enterprises. Migrant workers therefore expect and get little legal protection or recourse from government officials.

Third, as already mentioned, migrant factory workers are denied access to better-paying skilled, technical, administrative, and managerial employment options in the permanent urban sector. They are frozen out of the better-paying urban labor market and overcrowded into the lower-paying rural and factory labor markets. If rural citizens were permitted to work in *any* urban job, not just in factories or construction sites, factory wages would rise - even if the relative wages of permanent urban citizens who now have privileged access to higher-paying jobs outside the factory system might fall.

Fourth, the “reservation wage” of migrant factory workers is set, in part, by the level of subsistence in the countryside. That is, in order to attract the rural unemployed to migrate into unskilled factory production, employers need only offer a wage that marginally exceeds rural subsistence levels plus transportation costs, not a wage that adequately compensates the workers’ productivity. The degree of destitution in the Chinese countryside - and, therefore, the level of wages that must be offered by factories in order to lure migrant workers from the countryside -- is anything but “natural” or “pre-political.” ...

p. 19

An urban *hukou* entitles one to public housing, health-care, and pensions -- all denied to holders of rural *hukou*. In the pre-reform era, “[t]he main enforcement mechanisms included the state control of agricultural production and procurement, the suppression of food-staple prices, and restrictions on rural-to-urban migration via a household registration system.” In the post-reform era, the government continued to undertake “massive transfer[s],” by means of large-scale government investments in city infrastructure and social services to urban elites, paid for in part by an inflationary tax borne principally by the peasantry, and in part by urban subsidies channeled through the state-owned banking system, in which rural residents must deposit their savings.

On top of these nationwide policies, local officials support themselves by imposing crushing taxes on rural citizens, driving peasants into factory work:

The economics are simple, residents said. People in Xiaoshan eat most of what they grow, and by selling the rest they earn an average annual income of about \$25 each. But local officials demand about \$37 per person in taxes and fees. Several peasants who refused to pay last year were arrested. Migrant factory workers “remain confined within—the state’s persisting imperative: to ally urban growth and productivity with cost-saving, and, as a ‘socialist’ state, to provide for the city dweller while preserving the ruralite as docile, disposable trespasser, and drudge.”

In light of these various mechanisms for artificially suppressing workers’ bargaining power, it is not surprising that Chinese factory workers live under conditions that neutral researchers (and Chinese officials themselves) describe as “bestial,” “horrific,” and “abominable.” They are often beaten and physically humiliated by supervisors and private security guards. They are paid far less than the legal minimum wage, which is itself set far below the minimum wages of countries at a comparable level of development. Their wages are often arbitrarily withheld or unpaid altogether. Many work twelve to eighteen hour days, seven days a week, without a day of rest for months at a stretch. “Death by over-working” -- or *guolaosi* -- has become a commonly used term in contemporary China, and it is not used metaphorically. Most firms implement few health and safety measures, exposing workers to death not only by exhaustion but by toxins and machinery as well. China’s rates of industrial death and lost limbs exceed any in history.

As a result, a startling number of workers take desperate, violent measures simply to draw attention to their plight - from blocking roads and railways to self-immolation. In contrast

with other developing countries, most Chinese migrant workers wish to return to the countryside rather than settle in the city - another sign of China's heightened exploitation of manufacturing workers. ...

p. 26

At the enterprise level, union officers are dominated by managers and local Party officials. Indeed, in both State-Owned Enterprises (SOEs) and Foreign-Invested Enterprises (FIEs), managers themselves typically serve jointly as ACFTU union officials - a startling indication of the subservience of the ACFTU to the Party's objective of management-led development. Where managers do not serve as union officers, managers nonetheless select union officers in agreement with local labor departments, which are tightly controlled by local Party officials. The enterprise pays the union officers' salaries. The enterprise also controls union finances. The government mandates that the enterprise forward 2 percent of its wage bill as union fees to the ACFTU, but enterprises often simply appropriate or fail to dispense that sum. ...

p. 27

In the late 1990s, it was evident that the ACFTU was failing as an instrument of workforce discipline. The number of illegal labor protests surpassed 200,000 in 1999 and reached nearly 270,000 in 2000. The Party has deployed two counter-strategies. First, it enacted the 2001 amendments to the Trade Union Law, quoted above, in an attempt to reaffirm and consolidate the ACFTU's mandate to impose managerial discipline. Second, the Party relies on brute violence and abuse of criminal process to quell worker protests and independent worker associations.

p. 29

In sum, factory workers in China are wholly denied the fundamental rights of association and collective bargaining, by law and practice. Either the monopolistic ACFTU is present in an enterprise, or there is no union at all. Where the ACFTU is present, its role is to discipline the workforce on behalf of Party policies, local development strategies, and investor goals, not to assert worker interests and rights. Strikes are illegal in China, and the ACFTU is charged with the task of suppressing them. While there may be dissidents within the ACFTU who are worthy of support, they are overwhelmed by the Party's stringent control. When workers protest or associate outside the constraints of the ACFTU, they enter a whirlwind of state terror, of torture, beatings, forced labor, and long-term imprisonment. The PRC unremittingly represses rights of association and strikes in all sectors of manufacturing - textiles, toys, leather goods, footwear, electronics, auto, motorcycle, petrochemicals, metallurgical, machinery, paper, printing, plastics, and all other sectors.

p. 30

The vast bulk of China's factory workers are temporary migrants holding rural *hukou*. The *hukou* system enmeshes factory workers in a system of bonded labor, a form of forced labor that violates Conventions 29 and 105 of the International Labor Organization and constitutes an unreasonable trade practice under section 301(d) of the Trade Act. This Section explains China's creation of a submerged caste of bonded factory workers.

Chinese citizens holding rural *hukou* who seek work in towns and cities without government permission are outlaws. But even when migrant workers obtain temporary residence cards and work permits in the towns and cities, they remain ineligible for basic

social services such as health care, public housing, food rations, and education for their children. They are subject to constant surveillance and control, and may at any time suffer arbitrary, summary expulsion by the Public Security forces.

p. 32

Local governments - relying on a 1982 law of the State Council, which authorized local governments to designate jobless migrants as “vagrants and beggars” - have placed jobless migrants in detention and forcibly “repatriated” them to their place of permanent residence. Local governments each year have held tens of thousands of migrant workers in “Custody and Repatriation Centers,” on the ostensible ground that they cannot show temporary residence and work certificates required in that jurisdiction. Local authorities force detainees in these Centers to work on public projects. Detainees are raped, beaten, and otherwise abused. Local officials require detainees to pay “ransoms” to gain release from custody. Once released, migrants are forcibly repatriated to their place of permanent registration.

Migrant workers live in terror of being arbitrarily detained and repatriated by local Public Security forces. On March 20, 2003, Sun Zhigang, a college-educated migrant from Hubei Province, was beaten to death in a detention center in Guangzhou. In response to domestic and international criticism, the State Council with much fanfare announced the repeal of the 1982 law on vagrants and beggars. The State Council immediately replaced that law, however, with a new decree for managing “indigent vagrants and beggars in cities.” The new decree changes the name of migrant detention centers -- from “Custody and Repatriation Centers” to “Aid Stations” – but gives local officials authority that is nearly as broad as their authority under the 1982 law. (Tellingly, the central government also retaliated against the Guangzhou newspaper that reported Sun’s death. )...

p. 33

In July, 2003, the Ministry of Civil Affairs promulgated rules implementing the new State Council decree. The rules require “vagrants and beggars” to present the Aid Stations with “residency identification card or other proof of identity, place of household registration, and place of domicile.” The migrant is then required to comply with “the rules and regulations of the stations,” including any rules that local government may formulate regarding the jobless migrants’ “daily schedule” in the Aid Station. After contacting the Public Security Department of the migrant’s place of permanent registration, the Aid Station must transport the migrant to that place, at the migrant’s expense if she has sufficient funds. ...

p. 37

Workers arriving from the countryside must pay substantial fees to local government officials and to employers in order to obtain residence and work permits required by the *bukou* system. Some of these payments are mandated by central and local law; some are “extra-legal” exactions by corrupt local officials and managers. As described above, the required fees and certificates vary widely from locality to locality, and are administered by local officials with almost complete discretion. Workers routinely go into debt in order to make these various up-front payments.

“[M]igrant workers are cash cows for local bureaucracies.” In Shenzhen, for example, 70 percent of local government revenue is drawn from migrant workers. Workers therefore face a bewildering array of certification requirements, and fees that are crushing. For example, one migrant to Shenzhen in 2001 needed to obtain the following documents, each of which required payment of a substantial fee: A border region pass, a personal identity card, an

unmarried status certificate, a certificate to prove birth within China's one-child policy, a work permit, and a temporary residence permit. On top of these, the migrant to Shenzhen was required to pay a bond or "deposit" to the employer. These deposits are as much as 4000 Yuan, exceeding one year's wages. Some local governments require enterprises to pay "new-hire" fees, but managers pass those fees on to new workers as well. These investments often exceed the migrant's life saving. To pay for them, migrants incur substantial debt, often payable to their own employer. As in classic bonded labor, a workers' up-front deposit will be lost and her debts will be in default, if the worker attempts to exit the employment relation. ...

p. 39

New migrants' feverish effort to find jobs in order to avoid expulsion from urban areas, and their submission to employers' terms no matter how unfair, is a common sight in contemporary China. "New arrivals—, desperate to recoup the amount they have invested in transport expenses and in applying for the array of necessary documents and certificates before leaving home, will take any job available." ...

p. 41

Government policy -- the *hukou* system, and the plethora of government controls on temporary migrant workers in the manufacturing sector -- creates an enormous submerged caste of unskilled factory workers. Migrant workers effectively live in a Hobbesian state of anarchy, in which they are subject to intimidation, fraud, and violence, without recourse to protection by police or courts. Indeed, as already described, the Public Security police are themselves often the perpetrators of fraud, violence, and arbitrary exactions against migrants. Hence, if workers are abused by employers, their only recourse is to escape the workplace, or to engage in desperate acts of protest - blocking roads and railways, threatening suicide, even self-immolation. ...

p. 43

The wages and hours of China's factory workers are effectively unprotected by legal regulation or by contract. Migrant workers are paid extremely low monthly sums - from 200 to 600 Rmb (approximately \$24 to \$72) -- in return for working as many hours as employers can extract from them.\* They often work twelve to eighteen hours per day, with no days off

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\* Economists and other social scientists widely recognize that reliable large-sample data on Chinese economic and social life are extraordinarily difficult to obtain - precisely because China is an authoritarian, closed society. Much academic research on China must therefore rely on "ethnographic" descriptions, newspaper stories, and other anecdotal reports. China's official wage data are inaccurate, because they rely on employers' reports of wages paid. Wage data provided by employers are utterly unreliable. As detailed in this Section, employers routinely report that they are paying minimum wages, when they in fact are paying much less. Employers routinely keep two or more sets of books for just this purpose. For this reason, the hourly and monthly wages publicly reported by Western multinationals that out-source their production to China are generally overstated. See, e.g., Professor Mark Barenberg, Interviews with Asia Compliance Officers of Multinational Brands and Agents in Toys, Apparel, Footwear, and Retail, Hong Kong and Bangkok (May- June 2002). The most reliable wage data are obtained by researchers who painstakingly

for months at a time. They are rarely paid full overtime wages, and sometimes are not paid at all.

Non-payment of wages is pervasive. According to a government survey, three out of four workers are unable to collect their pay as promised. An independent researcher found that “the illegal retention of workers’ wages for between one and three months exists in 80 percent of foreign-financed firms” in Dongguan. A majority of workers must resort to begging or intimidating their employers simply to get paid. As a consequence, the wages actually collected by workers are well below the amount negotiated at the start of their employment. This results not from enterprises’ financial difficulty but rather from employers’ “deliberate malpractice,” permitted by the negligible bargaining power of China’s bonded workers. Factory workers fear that they will be discharged and lose their deposit “if they pursue their wages.”

Hourly wages and unit labor costs are therefore greatly suppressed. Manufacturing wages for female workers range as low as 12 cents to 30 cents per hour. Male workers earn approximately 10 or 15 percent more. Many credible researchers agree that the wages of China’s factory workers have remained flat or fallen in the last decade, even as productivity has risen steadily. ...

pp. 47-49

The overtime wage rate is seldom paid. Employers give workers misleading explanations of how their compensation is calculated and provide false wage and hour records, if any records are provided at all. As explained in the previous section, a large majority of China’s export workers are young, single migrants who live in dormitories within the fences of company compounds - a simulacrum of the old Communist “work units.” (Between six and twenty workers sleep together in the bunk beds of a single, small room measuring 8 to 20 square meters.) Workers are therefore under the surveillance of company security personnel not only on the factory floor but also in their place of residence. Many factories cross the line from surveillance to imprisonment. Workers are permitted to leave the factory compound only for brief periods each week, or, in some instances, not at all. In these circumstances, workers are captives of companies’ private security forces around the clock. They are therefore virtually helpless to resist employers’ demand that they work limitless overtime hours. Employers use an array of methods to reduce hourly compensation:

- Employers require workers to work overtime hours far in excess of official standards, at reduced hourly wage rates or with no compensation at all, on the ground that production quotas have not been met or some other pretext.

- Employers make many deductions from the basic wage: up-front deposits; withheld wages; fees for work and residence permits ostensibly purchased by the firm but often never received by workers; exorbitant dormitory and meal fees; fees for factory IDs, handbooks, and equipment; payments to company stores within company compounds, from which

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interview workers in order to reconstruct wages received, deductions from wages, regular and overtime hours worked, and production for piece-rates and quotas. This is painstaking, precisely because workers are often unsure about the employers’ methods for calculating wages, and employers often wish to keep it that way. Workers are often paid months or even a year after the wages are earned, making it even more difficult for workers to prove the overtime hours or piece-work they accrued.

workers' free exit is often severely restricted; and penalties for missing production targets, for taking more than five minutes to use toilets, for missing work due to illness, for talking or laughing during work hours, during noon break, or during sleep time, for not marching in unison to and from work stations, for not making one's dormitory bed, for not staying in one's bed when lights are out, for drawing a curtain for privacy around one's dormitory bed, and for other infractions of militaristic rules.

- Employers require workers to arrive at workstations one hour early for "preparation" and stay late for "cleanup" with no additional pay.

- Employers simply fail to pay workers their wages at all, ostensibly because the firm is financially strapped, but in fact because they can do so with impunity and workers lack the information, bargaining power, or legal recourse to challenge the managers' claim about company finances.

- Employers keep double, triple, or even quadruple sets of books - one for the formal record-keeping of local Labor Bureaus; another for the "social compliance" auditors of multinational corporations that have adopted labor codes; another for misrepresenting to workers the compensable hours they've worked; and another for the actual wages paid and hours worked.

- Employers fail to enter into written contracts with workers, disabling workers from asserting any legal entitlement to payment of verbally agreed-upon wages. The upshot of these practices is that workers are routinely paid a monthly wage not only far below the legal minimum, but below the agreed-upon wage as well. Further, the actual monthly wage paid is only related loosely, if at all, to the actual number of hours they work each month. Many workers are effectively "salaried" workers who come to expect a monthly or yearly sum - very low and paid erratically -- for working as many hours as employers demand, without limit. Many others work at piece rates that yield equally low monthly or yearly wages and, therefore, equally low hourly wages. ...

p. 50

China's failure to enforce occupational safety and health standards violates International Labor Organization Conventions 119, 136, 139, 148, 155, and 170 and constitutes an unreasonable trade practice under Section 301(d) of the Trade Act. 220 According to conservative reports, workplace accidents killed 140,000 workers in China last year. At least 80 percent of workplace deaths occur among the migrant workers in the export sector. Another 250,000 reportedly lost fingers, hands, feet, arms, legs, and suffered other injuries -- in the absence of protective machine guards and other safety devices that are routinely used elsewhere in global industry. In the view of independent experts in occupational safety and health (OSH), the actual industrial carnage in China may be several times as high as these estimates. ...

## **A. UNPRECEDENTED JOB LOSS IN U.S. MANUFACTURING**

The manufacturing sector in the United States has lost jobs for 43 straight months. Since January 2001, the U.S. economy has lost 2,931,000 private sector jobs.\* The manufacturing

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\* Most data in this paragraph are from the Bureau of Labor Statistics and MGB Information Services. For more detail see the full report.

sector has lost 2,790,000 jobs. That is, even though manufacturing accounted for 13 percent of U.S. employment in January 2001, it accounts for 95 percent of the jobs lost in the 36 months since then. This is not a cyclical phenomenon explained by the economy-wide recession that ended in November 2001. Even during the economic “recovery” of the last 27 months, 1,361,000 manufacturing workers lost their jobs, and manufacturing hours declined 7.7 percent. In the last 12 months, the real hourly and weekly wages of U.S. rank-and-file employees fell. The ordeal of U.S. manufacturing workers continues amidst the most expansionary monetary and fiscal policies in memory -- near zero interest rates and record budget deficits. In the last three months of the “recovery” -- December 2003 through February 2004 -- another 40,000 manufacturing jobs were lost.

In the first 27 months of recoveries in the past, total employment increased by an average of approximately 6 percent. If the current recovery had followed this trend, the economy would have gained 7.85 million jobs since November 2001, rather than extinguishing nearly three million jobs.

These numbers, as stunning as they are, represent only *net* decreases in employment. They do not include the workers who have been discharged in the manufacturing sector and suffered the high costs of unemployment and transition to new manufacturing jobs. Workers can be discharged in small numbers or in “mass layoffs” of 50 or more employees. There were 39,240 mass layoffs reported in 2002 and 2003, affecting 4,133,977 jobs. Thirty-nine percent of those workers were in manufacturing even though, as mentioned above, manufacturing accounts for less than 13 percent of the nation’s workforce.

The data on job loss by manufacturing sector are also staggering. Employment in textile mills fell from 480,400 to 241,300 between 1994 and 2004. Jobs in apparel fell from 853,800 to 295,700 during the same period. In the textile and apparel sectors overall, employment fell by 54.4 percent, with a total job loss of 846,700 during the nine years since December, 1994. In aerospace products and parts, employment fell by 47.8 percent since 1990, with a loss of 536,700 jobs.

In the last three years alone, employment in the computer and electronic products sector has dropped by 538,000 workers or 28.8 percent; employment in electrical equipment and appliances has fallen by 133,000 or 22.8 percent; in machinery 312,000 or 21.6 percent; in fabricated metal products 282,000 or 16 percent; in primary metals 146,000 or 24 percent; in transportation equipment 212,000 or 10.7 percent; in furniture products 103,000 or 15.2 percent; in textile mills 124,000 or 34.1 percent; in apparel 175,000 or 37.3 percent; in leather products 89,000 or 14.9 percent; in printing 128,000 or 16.1 percent; in paper products 89,000 or 14.9 percent; in plastics and rubber products 13.8 percent. In the furniture sector, in just two years (from 2000 to 2002) U.S. manufacturers lost 11.5 percent of market share to China. ...

p. 58

Employment data for specific manufacturing occupations are available only through 2002 and therefore do not reflect the continued hemorrhaging of manufacturing jobs through 2003. The data through 2002 are grim enough. In just three years – from fourth-quarter 1999 to fourth-quarter 2002, one full year into the economy recovery – the number of electronics assemblers in the U.S. fell from 457,260 to 324,530.\*\* The number of textile machine

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\*\* The data in this paragraph are from the Bureau of Labor Statistics, National Employment and Wage Data from the Occupational Employment Statistics Survey by Occupation, 1999 and 2002. Some of the occupational categories are combined in the text, for ease of exposition.

operators dropped from 247,120 to 181,130, and the number of sewing machine operators fell from 403,770 to 277,800. Employment of engine assemblers fell from 85,570 to 49,280; computer-controlled machine tool operators from 168,170 to 128,400; tool and die makers from 132,350 to 105,210; welders from 478,720 to 418,250; cutting and press machine operators from 353,300 to 277,410; extruding machine operators in metals, plastics, chemicals, and textiles from 218,480 to 194,390; woodworking machine operators and furniture finishers from 141,690 to 120,070; inspectors, testers, sorters, samplers, and weighers from 577,650 to 500,250; general assemblers from 1,302,820 to 1,139,360; packagers and packers from 1,114,330 to 927,740; production helpers from 584,060 to 464,390; and production supervisors from 760,050 to 700,490.

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<sup>1</sup> See ASCE Report Card, Sept. 2003, [www.asce.org/reportcard](http://www.asce.org/reportcard) . Additional estimates of investment needs for low-income housing and railroad electrification were prepared by Seymour Melman and John E. Ullmann.

<sup>2</sup> See *FY 2005 Historical Tables of the US Government Budget*, U.S. GPO, Washington DC, 2004, Table 9.6.

<sup>3</sup> REMI Policy Insight, version 5.3. Regional Economic Models Inc., Amherst MA, 01002. See [www.remi.com](http://www.remi.com)