U.S. DEPARTMENT OF COMMERCE
Washington, D.C. 20230

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UNDER SECRETARY OF COMMERCE FOR TRANSPORTATION
BEFORE THE COMMITTEE ON COMMERCE, UNITED STATES SENATE
ON HEARINGS REGARDING PUBLIC LAW 88-108
AND AWARD OF ARBITRATION BOARD 282
WEDNESDAY, SEPTEMBER 15, 1965

TECHNOLOGICAL INNOVATION IN AMERICAN TRANSPORTATION

The 20th Century history of American transportation has been a continuous succession of invention and innovation. Significantly, many of these inventions led directly to the development of competing modes of transportation. Each innovation has created new benefits for transportation users, but many have had adverse impact upon other segments of the industry and their employees. Our existing transportation system, and its many problems, must be seen in the light of this history.

In the 19th Century railways, themselves a revolutionary technological development, completely dominated the movement of intercity freight and passenger traffic. Since then, and until the last five years, however, the railroads have experienced a steady erosion of their hegemony. A whole series of new transportation industries have arisen to take away sections of the railroad business. Since 1930, the motor truck industry has increased its percentage of intercity freight by six times and its total business has increased from 20 to 350 billion ton miles; pipelines have increased their percentage of intercity freight traffic three times; the inland waterways have maintained their position and continue to carry between 15 percent and 20 percent of intercity freight.

In this short period, the public airline and private automobile both established themselves as vital links in our transportation system, almost completely supplanting the railways as carriers of intercity passengers. Today, the private automobile is used in almost 90 percent of total intercity passenger miles, and the airlines today carry almost 50 percent of the passengers who travel on intercity common carriers -- flying nearly 50 billion passenger miles.

In short, technological change has introduced extensive competition into our transportation system. This competition has in turn increased the pressures on each of the competing modes to utilize more fully existing technology and develop further innovations to maintain and increase its share of our national freight and passenger business.

In recent years, the railways have fought back in an attempt to regain or maintain their share of freight traffic and, more importantly, to regain some of the high revenue traffic lost to the trucks. The industry's chief weapon has been technological innovation. Between 1947 and 1960 the diesel engine completely supplanted the steam locomotive. Average train speeds between terminals have increased by 20 percent since 1947. Substantial technical improvements have been made in the maintenance of track and roadbed, with common labor on the tracks being replaced by mobile power units that make repairs while moving slowly over the road. Electronic equipment has been installed to improve traffic control, to automate freight yards, to insure better accounting of rolling equipment and to speed the communications network. "Piggy-back" freight systems have been developed to cut terminal costs and to speed delivery and

flexibility of service. New types of cars have been introduced to aid in the railroad's efforts to attract specific kinds of traffic. A dramatic example of this is the triple-tiered auto rack car which has regained a substantial portion of the traffic in new automobiles from the trucking industry. Terminal time has been cut in many areas by the development of automatic classification yards. Unitized trains have been experimented with successfully in the handling of such bulk commodities as coal and ore.

In response to these often heroic efforts by the railroads to regain part of their lost business, the newer competing modes of transportation have in turn introduced many forms of technological innovation to hold and expand their share. Truckers have been spurred to lower overhead costs, improve terminal operations, and invest extensively in new equipment. Most important to the trucking industry, of course, has been our immense national expenditure on improved highway systems.

Pipelines, today primarily carriers of petroleum products, are achieving almost complete automation and are increasing speed of carriage and life of pipe. Inland water carriage has been improved through the development of heavier diesel towboats permitting longer tows and faster service. Moreover, national investment in improved docking and carriage facilities on our rivers and canals has helped substantially to improve or maintain the competitive posture of the inland water carriers.

The immense progress of our air carriers is well known. The jet aircraft has proved to be an efficient producer of rapid passenger service and increased airline profits. While air freight still carries less than 1 percent of intercity freight, its potential is anywhere from 20 to 50 times greater.

Our maritime transportation system has been undergoing changes as well. There have been significant strides, particularly on the West Coast, to mechanize operations and to speed the introduction of containerized forms of transport. For example, unitized cargo handling systems offer the potential for tremendous savings over present methods. With the merchant marine, as in other areas, human adjustments to these technological innovations present a challenge which must be met. There is no alternative if we are to maintain a viable transportation network, in terms of service to transportation users and continued profitability among the competing modes of transportation. We must allow and encourage technological innovation.

Yet while I recognize that we must have the results of invention and innovation in improving transportation services, I am keenly aware of the impact upon the transportation work force resulting from these changes. Nor are such problems new. We know that technology creates a need for new skills and occupations at the same time that it destroys others.

The American railroad industry gives a vivid example of the very substantial alterations that technological innovation can require in the work force needed by an industry. Changes in technology, in the scope of operations, in the demand for railroad services, and in the product mix carried by the railroads had immense impact upon the railroad work force.

Total railroad employment dropped by almost 50 percent between 1947 and 1963 for a net loss of 672,000 jobs. This decline in total job offerings was spread unequally throughout the railroad work force, however.

Maintenance-of-way employment dropped by 63 percent, employment of skilled workers in repair shops dropped by almost 60 percent, and the number of boilermakers declined by well over 80 percent. On the other hand, employment of electrical workers increased by 5 percent. Other occupational groups on the railways had smaller declines than the average for the industry. Clerical and general office employment declined less than 40 percent even though they were substantially affected by the introduction of electronic data processing systems. Executives and professional employees were least affected as a general group; their total employment declining by only about 10 percent.

The most recent and striking change is the effect of Public Law 88-108 and Arbitration Award 282 upon locomotive firemen and helpers. Their numbers have been reduced by almost half in little more than a year. The railroad work rules dispute that led to this reduction does not require my re-telling here. While I regret the loss of established skills of these men, and the fact that some have had to find work in other industries, I would emphasize that they were not uniquely situated. Other railroad crafts had work rules too, and have had difficult transitional periods of adjusting to innovation. If some hardships have been caused that could have been reasonably avoided, the firemen are entitled to recourse under the award or in the courts. But these problems, difficult as they are, should not be allowed to halt innovation or maximization of the gains resulting therefrom in any transportation sector.

Similar harsh impacts upon different occupational groups have occurred in almost all of our transportation industries. Even in those industries where overall employment has been steadily increasing, such as trucking and airlines, whole occupations have been displaced. Recurrent collective bargaining crises in these industries, however, should not blind us to the fact that the transportation industries have also recorded some of the most significant and forward-looking adjustments to technological innovation in all of American industry.

The use of economic guarantees to cushion the impact of innovation is also widespread in the railroad industry. The airline industry has also pioneered in several areas of adjustment to change and great success has been achieved in developing formal channels of access to new

occupational categories.

The drive for early retirement as one response to the human problems of technological change probably has achieved its most spectacular success in the maritime industry. When the shipping companies served notice of the introduction of "automated" ships, the National Maritime Union was confronted with the prospect of a 25 percent reduction in crew size. Initially, the NMU staunchly resisted any reduction in manning requirements. Ultimately, however, the union agreed to cuts in crew size on automated ships but exacted a quid pro quo in the form of early retirement. While institution of these programs in the maritime industry has not been without subsequent difficulties, they promise hope for the future. Other inducements to early retirement have taken the form of special bonuses in addition to the regular pensions.

In the trucking industry, as I previously noted, innovation has not caused substantial job displacement, because of the limited nature of the changes occurring and because of overall expansion of job opportunities throughout the industry. Nonetheless, the unions have, when possible, negotiated agreements which reflect their long-run interest in protecting themselves against job displacement resulting from increased competition due to technological change.

In summary, I would like to emphasize that our present difficulties over adjusting to technological innovation are not new in American transportation. Invention and change--in short, progress--has been the lifeblood of our transportation system. Competing modes of transportation

have risen to challenge established carriers for the market, and the competition has engendered further innovation in all transportation sectors. The result has been more rapid and efficient systems for the movement of passengers and goods. I hope and believe that similar changes and improvements will continue in the future.

The consequences of these changes upon transportation workers are likewise familiar. What has changed today is that as a Nation we are more conscious of the impact of change upon human beings. We no longer consider the individual worker to be at the mercy of impersonal forces, to sink or swim as best he can, but believe that the whole society which reaps the benefits of change must share in cushioning the resulting personal losses.

I believe that modern managements and unions, through the process of collective bargaining, can continue to reach peaceful and productive solutions to the large majority of these problems. But there is much that can be done in transportation to improve the overall climate of collective bargaining. One of the greatest causes of deadlock on issues of job protection and technical change is the number of separate unions involved. A very narrow basis of craft definition is reinforced by the number of unions in many forms of transportation. This inhibits flexibility in assigning workers to new jobs in the transportation industry.

Collective bargaining in this area cannot proceed properly so long as positions remain rigid. Positions will remain rigid so long as entire unions and crafts are threatened. The long-range solution is to

widen the basis of union representation through merger of transportation unions to spread the risk of unemployment and to open up a wider range of employment opportunities to those who will be displaced by technological innovation.

We are in a competitive situation domestically and internationally when efficiency of our transportation system is the only measure of success in an economic sense. As a Nation we must take advantage of continuing technological improvements and we must develop a system which allows us to do so without the expensive, wasteful and agonizing effects of nation-wide transportation strikes. But from the standpoint of public policy, it is absolutely essential that the requirements for efficiency be accompanied by provisions for the problems of dislocation. The two go hand-in-hand.

The Government has a major responsibility in this area--in fact the Government is probably the only institution which can deal adequately with the problem of workers who are displaced by technological change. In this short statement, I can only suggest the need for a more definitive National policy toward labor adjustments to changes in industry. The whole pattern of terminal payments and benefits, retirement, job retraining, related labor laws, and many other aspects are involved in this picture. I can only state that transportation industries would be greatly benefited by any general pattern or policy that might be developed in this field, so that the problems facing transportation might conform to a general policy.