

Moving The Goods: As The Interstate Era Begins

An Introduction to Web Site Information on Freight Transportation

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An Introduction to Web Site Information on Freight Transportation

by

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Federal Highway Administration

We were not a wealthy Nation when we began improving our highways... but the roads themselves helped us create a new wealth, in business and industry and land values... So it was not our wealth that made our highways possible. Rather, it was our highways that made our wealth possible.

Thomas H. MacDonald
Chief, U.S. Bureau of Public Roads

In signing the 1966 legislation that created the U.S. Department of Transportation, President Lyndon B. Johnson said, "In large measure, America's history is a history of her transportation." From the ships that brought European colonists to the Western Hemisphere, to the settling of a vast continent from coast to coast, even to the more distant reaches of Alaska and Hawaii, transportation was the essential ingredient that made the United States a nation of movers. The advance of culture and the spread of ideas; the unity of a people divided by geography, heritage, and interest; and the mobility of free people depended on transportation.

President Thomas Jefferson shared this view of transportation. Following the Louisiana Purchase in 1803, he had dispatched the Lewis and Clark Corps of Discovery to explore the Missouri River valley in hopes of finding the long-sought northwest passage that would provide commercial ties by water between the Atlantic and Pacific Oceans. Although the transcontinental water route did not exist, Lewis and Clark brought information to Jefferson about the distant reaches of a mysterious continent, as well as news of the Native Americans who inhabited it and the animals, plants, and geography encountered along the way.

On March 29, 1806, three years after Lewis and Clark left for the West Coast, President Jefferson approved legislation to construct the Cumberland Road (also called the National Road). He understood that by bridging the land gap between the Potomac and Ohio Rivers, the Cumberland Road would build commercial and social links that would bind the territories west of the Appalachian Mountains to the eastern States. As President Jefferson explained in his 1806 message to the 9th Congress, the most important transportation modes of his day, roads and canals, would knit the union together, facilitate defense, furnish avenues of trade, break down prejudices, and consolidate a "union of sentiment." Further, with such "great objects" as public education, roads, rivers, and canals, "new channels of communication will be opened between the states; the lines of separation will disappear, their interests will be identified, and their union cemented by new and indissoluble ties."

One of the chief functions of transportation is the movement of goods. Initially, rivers provided a natural means of transportation for the colonists. They gradually carved a primitive road network out of the forest along the narrow footpaths of the displaced Native Americans to transport goods, people, and ideas. Entrepreneurs began to carry goods among the cities and settlements via the means best suited to the roads, namely pack trains of mules. The evolution of transportation continued through the centuries, with wagons and stagecoaches, flatboats, canals, steamboats, and railroads providing increasingly efficient, ever faster service.

While history usually tells the story of an evolving country in a world of political uncertainties, the story takes place on a backdrop of transportation.

The Federal Highway Administration Web site contains many items about freight transportation: *The Freight Story: A National Perspective on Enhancing Freight Transportation*:

http://ops.fhwa.dot.gov/freight/freight_analysis/freight_story/

Freight Facts and Figures 2005:

http://ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/05factsfigures/

Freight Transportation: Improvements and the Economy:

http://ops.fhwa.dot.gov/freight/freight_analysis/improve_econ/

Additional publications and information on freight:

<http://ops.fhwa.dot.gov/> and <http://ops.fhwa.dot.gov/publications/publications.htm#fa>

For a broader view of freight transportation from all elements of the U.S. Department of Transportation, see:

<http://www.dot.gov/freight/>

These items provide an overview of freight transportation in the United States today and how it has evolved in recent decades. The following article is about freight transportation prior to the Interstate System.

The 20th Century

As the 20th century began, railroads dominated interstate transportation, whether freight or passengers. The automobile was of little value as a substitute, and the airplane had yet to take its first flight at Kitty Hawk.

The Good Roads Movement that had begun in the 1880s to promote improved roads for bicycles, took hold as the automobile began to gain power and speed. When Henry Ford introduced the low priced Model T in 1908, he transformed the landscape. Soon, the automobile would be a staple of the American family, with roads gradually improved to expand the scope of travel.

Early trucks, which could not compete in cost or speed with railroads, were most efficient in cities and transporting farm goods to rail or cities. World War I changed that. With the American entry into the European war in April 1917, the railroads were stretched beyond their capacity. For the first time, interstate transportation of freight by truck became not only possible but essential. Interstate roads were still largely dirt, and the trucks tore them up, but trucks demonstrated their value.

Recognizing the symbiotic relationship between roads and trucks, the roadbuilders and truck manufacturers agreed to limit the capacity of trucks to 7½ tons. Looking back on this period, Thomas H. MacDonald, Chief of the U.S. Bureau of Public Roads (BPR) from 1919 to 1953, explained that the compromise reflected recognition that the cost of highway transportation "is made up of the cost of the highways and the cost of operating the vehicles over the highways." The goal, he said, of road builders, vehicle manufacturers, and operators "should be to reduce the total cost of transportation rather than one or the other of the elemental costs." He explained:

It could be proved that the number of large-capacity trucks already using some of the highways, principally those radiating from and connecting the larger cities - had already grown to the point where the combined savings in operating cost would more than balance the greater cost of providing highway service for them. As to those highways there could be little doubt of the wisdom of building a type of surface adequate for the heavy truck traffic.

Because present highway needs were far in excess of the country's financial ability to meet them, MacDonald did not believe in building for the future at this time:

Other roads, similarly located with respect to cities, had not yet developed a sufficient amount of the heavy traffic to repay the additional cost of the stronger construction, but it was not difficult to foresee that such a condition would develop in the future.

Although the Depression struck in 1929 and continued through the 1930s, the country was in the final stages of building its first interstate system of Federal-aid roads. A paved network of two-lane roads, usually carrying a U.S. number (such as U.S. 1 or U.S. 66), crisscrossed the Nation. However, with growing passenger and truck traffic on the roads, the network's deficiencies of design, efficiency, location, and safety were evident. Interest in an upgraded interstate network increased through the decade.

In the Federal-Aid Highway Act of 1938, Congress asked the BPR for a report on "the feasibility of building, and cost of, superhighways... including the feasibility of a toll system on such roads." The BPR based its report on data collected from extensive highway planning surveys that had been conducted around the country beginning in 1935. The origin-and-destination surveys showed that transcontinental traffic was limited, with traffic heaviest around cities and in interregional movements. Given the low income of most motorists, toll roads would have a traffic-repelling character. As a result, most routes would not carry enough traffic to generate sufficient revenue to pay off bonds needed to finance their construction.

Instead, the BPR recommended construction of a network of toll-free express highways. The BPR's description of "A Master Plan for Free Highway Development" was its first description of what would become the Interstate System. Based on the survey data, the BPR explained that the primary justification for the network was passenger traffic, particularly congested city traffic, not interstate trucking. In fact, the report made little reference to trucks.

President Franklin D. Roosevelt submitted *Toll Roads and Free Roads* to Congress on April 27, 1939. His transmittal letter summarized the report's conclusion:

It emphasizes the need of a special system of direct interregional highways, with all necessary connections through and around cities, designed to meet the requirements of the national defense and the needs of a growing peacetime traffic of longer range.

On April 14, 1941, with the Nation just a few months away from entering World War II, President Roosevelt appointed a National Interregional Highway Committee to explore the idea of a national interregional highway system. MacDonald, and his chief assistant, Herbert Fairbank, would dominate the committee's study and report. The report was essentially complete by the end of 1941, but with American entry in the war after the attack on Pearl Harbor on December 7, the report was shelved.

President Roosevelt submitted *Interregional Highways* to Congress on January 12, 1944. Like its predecessor, *Interregional Highways* based its conclusions largely on passenger traffic, with special emphasis on the need to address traffic problems in cities as a way of reversing the trends that were causing cities to decentralize, lose their tax base, and turn to blight. With the country at war, the report also focused on the military aspects of highway development.

As with the 1939 report, the 1944 study had little to say on "motor-trucks" and "tractor-trailers" or "semitrailer combinations." Much of what it did say related to the accommodation of trucks in cities, especially city terminals. Considering the visionary urban sections of the two reports, their failure to anticipate the positive impacts the Interstate System would have on trucking is surprising. The failure reflects the view MacDonald expressed on many occasions that railroads would remain the primary mode of interstate transport. Early in the 1930s, trucks carried only a small percentage of all interstate freight - about 2 or 3 percent. By the end of the decade, the percentage had increased to 10 percent. Despite this growth, *Interregional Highways* stated:

[The] Committee does not suggest that there is need of special highway facilities for the accommodation or encouragement of long-distance trucking. All the evidence amassed by the highway-planning surveys

points to the fact that the range of motortruck hauls is comparatively short. There is nothing to indicate the probability of an increasing range of such movements in the future.

The length of truck hauls will be determined in the future as it has been in the past; by the competitive advantages at various distances of other modes of transportation. The probable early development of an efficient commercial air-freight service, together with the keener competition of a rejuvenated rail service, would seem to forecast a future shortening rather than a lengthening of average highway-freight hauls.

How could two such brilliant men make such a huge miscalculation? MacDonald and Fairbank had come to maturity at the height of the Progressive Era, that period when, in theory, problems could be turned over to impartial experts who would gather the facts and select the solution the facts dictated. Although the era ended with World War I, MacDonald and Fairbank continued to follow the progressive approach throughout their careers. The mid-1930s highway planning surveys during the waning years of the Depression were an example. They provided the data MacDonald and Fairbank used to support the conclusions presented in *Toll Roads and Free Roads* and *Interregional Highways*.

MacDonald and Fairbank recognized the importance of their illustrative system to commerce as they mapped an illustrative Interregional System of 33,920 miles, including a single line through cities (plus 4,470 miles of urban circumferentials and distributing routes not shown in the report). "Where manufacturing activity exists in greatest volume," *Interregional Highways* explained, "there it may be assumed are the points of origin and destination of the greatest volumes of motortruck traffic." With factories located mainly in large cities, the report used census data on values added by manufacturing industries to compare the recommended network to "the relative probability of intercity highway freight movement." On the assumption that trucks operated primarily at local and interregional distances, not long distances in interstate transportation, the report used this comparison to demonstrate that the length of the illustrative network was "the system of optimum extent from the standpoint of service to manufacturing industry," not to suggest the network would serve ever increasing truck volumes.

Similarly, *Interregional Highways* evaluated the proposed illustrative network in relation to cities of varying size, population distribution, agricultural production, motor vehicle ownership, areas of large post-war employment release (such as workers employed in war industries), routes of heaviest traffic, and military needs. As with the data on manufacturing, this information was used to demonstrate that the proposed length of the network was valid. It was not used to imply an increased role for trucks in long-distance interstate freight transportation.

Experience during World War II seemed to support the assumption in the report that rail would continue to dominate interstate transportation. Motor freight traffic declined as a percentage of total ton-miles during the war to only 5.6 percent in 1943. (Each "ton-mile" is one ton of freight shipped one mile - it is considered the primary measure of freight transportation because it reflects volume (tons) and distance (miles).) Railroads, which carried 62 percent of all ton-miles of intercity freight traffic in 1940, carried 72 percent at the peak of the war period.

This decline in percentage for motor freight proved to be temporary. By the early 1950s, trucks carried 17 percent of all freight ton-miles. Even if MacDonald and Fairbank had attempted to extrapolate from the extensive pre-war data available to them as they completed *Interregional Highways* for the committee, they could not have predicted the different world that would emerge after World War II or how the changes that were to follow, such as the unprecedented post-war economic boom, would affect freight transportation.

Based on *Interregional Highways*, the Federal-Aid Highway Act of 1944 authorized designation of a 40,000-mile network "so located as to connect by routes, as direct as practicable, the principal metropolitan areas, cities, and industrial centers, to serve the national defense, and to connect at suitable border points with routes of continental importance in the Dominion of Canada and the Republic of Mexico." While adopting the concept proposed by the report, the 1944 Act abandoned the name used by MacDonald and Fairbank ("National System of Interregional Highways"). The change implies a more expansive vision than the original name, but did not result from such an intent. When Republicans on the House Committee on Roads learned that "interregional" referred to regions identified by the Department of Commerce based on common interests, they demanded a change based on Republican dislike of the "socialist planning" tendencies of the Roosevelt Administration. Under the 1944 Act, the network became the

National System of Interstate Highways. (For more on the name change, see "Naming the Interstate System" at <https://www.fhwa.dot.gov/infrastructure/naming.cfm>.)

The legislation, which President Roosevelt signed on December 20, 1944, did not create a funding program to build the Interstate System.

The Interstate Vision

Limited progress would be made on the Interstate System before President Dwight D. Eisenhower revived interest in the plan in 1954. He did so by challenging the Nation's Governors to work with a committee headed by General Lucius D. Clay (U.S. Army, retired) to find a way of financing a "grand plan" of highway improvement by every level of government. The Advisory Committee on a National Highway Program reported to the President in January 1955. In a chapter on "Use of Our Highways," the report explained that highway transportation consisted of "approximately 48 million passenger cars, 10 million trucks, and a quarter of a million buses, operating on 3,348,000 miles of roads and streets." Competition among the modes was acknowledged:

All forms of transportation are essential to the national economy, including waterways, railroads, airways, and pipelines, and their continued functioning as complementary services under equitable competitive conditions is important. Representatives of the railroads have pointed out to us the competitive threat represented by improved highway facilities and increasing truck haulage. However, this Committee was created to consider the highway network, and other media of transportation do not fall within its province.

The Clay Committee did not elaborate on the impact the Interstate System would have on trucking, even though one of its members, David Beck, was president of the International Brotherhood of Teamsters. The conclusion noted:

We are indeed a nation on wheels and we cannot permit these wheels to slow down. Our mass industries must have moving supply lines to feed raw materials into our factories and moving distribution lines to carry the finished product to store or home. Moreover, the hands which produce these goods and the services which make them useful must also move from home to factory to store to home.

In transmitting the report to Congress on February 22, 1955, President Eisenhower echoed the sentiment President Jefferson had expressed:

Our unity as a nation is sustained by free communication of thought and by easy transportation of people and goods. The ceaseless flow of information through the Republic is matched by individual and commercial movement over a vast system of interconnected highways crisscrossing the country and joining it at our national borders with friendly neighbors to the north and south.

The movement of freight received little further discussion in the pivotal Clay Committee report.

The Clay Committee's plan was to establish a Federal corporation that would issue bonds to fund completion of the 40,000-mile Interstate System in 10 years. Revenue from the existing 2-cent a gallon tax on gasoline and the tax on lubricating oils would be dedicated to retiring the bonds. Congress rejected this proposal almost immediately, in part because of the large amount of funds that would be needed to pay interest rather than build highways.

Senator Albert Gore, Sr. (D-Tn.), Chairman of the Subcommittee on Roads, introduced a bill that proposed to continue the existing Federal-aid highway program, but with \$500 million authorized for the Interstate System annually through Fiscal Year (FY) 1960. The bill did not contain a taxing method for raising the additional revenue for the Interstate System because under the Constitution, the U.S. House of Representatives must initiate tax legislation. Before leaving the Committee on Public Works, the bill was modified to increase Interstate funding to \$10 billion through FY 1961, with a Federal share of 75 percent. The Senate approved the bill on May 25, 1955.

Gore's House counterpart, Representative George H. Fallon (D-Md.), received permission from Speaker of the House Sam Rayburn (D-Tx.) to draft tax legislation that ordinarily would have originated in the Ways and Means Committee. His bill proposed graduated tax increases, including a penny hike in the 2-cent Federal gas tax (and another half-cent in 1970), as well as graduated tax increases on automobiles, trucks, and tires. With the increased revenue from these and other tax changes, Fallon believed the Interstate System could be built in 12 years on a pay-as-you-go-basis as funding came in.

The trucking industry objected strongly to the Fallon Bill. According to *Transport Topics* ("National Newspaper of the Motor Freight Carriers"), the American Trucking Associations (ATA) calculated that the annual cost of the Fallon Bill to highway users would be \$686 million. Heavy trucks and buses would pay about 45 percent of this added cost. The newspaper reported that John V. Lawrence, the managing director of ATA, advised members of the House Public Works and the Ways and Means Committees that the bill would increase taxes "to a confiscatory, ruinous and unjustified level." Further, Lawrence explained, "about half of the proposed dollar increase [would fall] upon less than 3 percent of the nation's motor vehicles." The present tax structure, he said, already resulted in an "enormously greater assessment against large vehicles than small vehicles." Singling out trucks in this way would "make indispensable truck service economically impossible and jeopardize the jobs of nearly seven million Americans."

When the Committee on Public Works held hearings on the Fallon Bill, the ATA's assistant general manager, William A. Bresnahan, testified that the trucking industry was one of the few groups willing to pay increased user taxes, but not if they fell disproportionately on truckers. The ATA favored tax increases "across the board" and would prefer no increase in the Federal highway program if the alternative was a program that imposed ruinous taxation on the industry.

At the heart of the controversy was the longstanding rivalry between truckers and the railroads. As writer/historian Theodore H. White explained in *Collier's* magazine ("Where are Those New Roads?" in the issue of January 6, 1956):

In modern America, truckmen and railway men have been as bitter and unforgiving enemies as sheepmen and cattlemen on the open range of Wyoming, 80 years ago. In the past 30 years the trucking industry has grown to be a giant that grosses over \$5 billion a year for freight haulage (against the railways' \$8 billion).

If the great Interstate System goes through, with its near-level grades, its limited accesses, its numerous and heavy-paved lanes, the truckers - now engaged principally in short-run transport - will have a chance to gnaw away as successfully at the railways' long-haul freight business as the airlines have at the railways' long-haul passenger business, and the commuters' automobiles at their suburban passenger business.

The truckers did not think the Fallon Bill placed what they saw as a disproportionate burden on their livelihood by chance, as White illustrated by quoting the ATA's Lawrence's comment on the railroad interests:

They have intervened in the highway program, attempting to promote punitive taxes on big trucks which will cripple truck competition with their own freight operations... Congressmen have evidence of that on their desks in the form of a barrage of letters, wires and calls inspired by railroad interests, and often indeed sent to their offices in railroad envelopes. No such railroad lobby has descended on Washington in the history of the Republic as that which is now operating in support of the soak-the-truck proposals. It is this wrecking crew which is mainly responsible for throwing the highway situation out of perspective.

The privately owned railroad companies realized they could not stop the popular Interstate System, so they focused on reducing the competitive advantage they believed the Federal Government would be giving to their rivals. The railroad industry had made its views on highway user taxes known on many occasions. Industry officials, who believed that motor carriers were not being taxed at a level that equaled the public cost of providing highways for their use, had become experts in design and construction of highway pavements. Pavements, representatives of the railroads

explained, had to have a stronger subbase and base and a thicker surface if they were to carry trucks instead of only passenger vehicles. Truckers ought to pay the difference.

Earlier in the year, Burton N. Behling, an economist with the Association of American Railroads (AAR), had told the House Committee on Public Works that, "Unless properly graduated user charges are levied against these heavy vehicles, private automobiles and other light vehicles are made to bear highway costs on behalf of the heavy vehicles." Behling elaborated on his point that truckers were under-taxed:

As the guiding principle, highways should be financed on the basis of adequate and properly scaled user-charges, so as not to disrupt the functioning of the Nation's entire system of transportation... A motor-fuel tax, standing alone and whether State or Federal, imposes a grossly inadequate charge upon heavy transportation vehicles which largely are the cause of the highway financial problem as it exists today. Every time a motorist buys a gallon of gasoline he is paying to have more heavy trucks disrupt his use of and pleasure from operating on our highways.

By the time the Fallon Bill came up for consideration in the House, the ATA had mobilized to block approval. As the front page headline in *Transport Topics* put it:

INDUSTRY FIGHTS 'RUINOUS' ROAD TAXES

The truckers led the battle, but rubber manufacturers, tire dealers, and farm groups were enlisted for the fight. A former member of the inactive Clay Committee, David Beck of the Teamsters Union, met with Speaker Rayburn to make clear the views of the union "whose resources," White explained, "are so important to Democrats in doubtful Congressional districts." In addition, Beck organized a campaign among the union's members. "Telegrams began to snow on Congress - an estimated 100,000 in all, 10,000 on Congressman Fallon's desk alone."

On July 27, 1955, as expected, the House rejected the Eisenhower proposal and the unpopular financing mechanism the Clay Committee had devised. However, in a shocking outcome, the House rejected the Fallon Bill by a wide margin, also largely because of the financing package in the bill. The New York Times reported that Speaker Rayburn blamed lobbyists for defeat of the Fallon Bill, which had been expected to pass easily:

While he did not identify them, it is well known that representatives of the trucking industry, aided by gasoline and tire industry spokesmen, have been most active in buttonholing legislators and inspiring telegrams and letters against the proposed tax rises.

"The people who were going to have to pay for these roads put on a propaganda campaign that killed the bill," the Speaker asserted.

Asked if he meant the trucking industry, he replied: "You can figure it out for yourself."

House Majority Leader John W. McCormack (D-Ma.) agreed. "Everyone wants a highway program but no one wants to pay for it. I have a sneaky idea that the truckers of the country played an important part in what happened."

The Congress adjourned without returning to the issue.

In the months since the failure of the 1955 legislation, the trucking industry and others who had objected to the taxing mechanisms of the Fallon Bill realized they would have to compromise if they were to get the new roads they wanted. An opportunity to discuss a possible compromise arose in September 1955 when Secretary of Commerce Sinclair Weeks formed a Cabinet committee that included Secretary of the Treasury George Humphrey and the Secretaries of Defense, Agriculture, and Labor as well as a White House representative to find a way to rescue the highway program in 1956. Historian Mark H. Rose, in *Interstate Express Highway Politics 1939-1989* (Revised Edition, The University of Tennessee Press, 1990), described how the truckers approached the Cabinet committee:

Truckers had made public, usually often, what they expected. At a series of conferences held during the last two weeks of October with members of the Cabinet Committee and their aides, heads of the trucking industry told their story again. Bonds and administration and anything else did not matter, just tax rates. Because the Fallon bill had imposed differential rates, especially on tires, they had opposed it. Truckers, a leader of the American Trucking Associations claimed, "were singled out in the Fallon Bill as the whipping boys." Tax equity, as they figured it out, amounted to uniform, one or two cent hikes on gasoline and tires. Without objection, moreover, they would pay another 2 percent excise on new trucks, provided proceeds went straight to highway construction.

Rose quoted the general manager of the Central Motor Freight Association, William Noorlag, Jr., to illustrate the conflicted view of the truckers:

If it were not for the urgent need to get the big highway building program under way without further delay, every red-blooded trucker and his legion of allied industry and shipper friends would switch his position from vigorous support of the highway program to an out-right, last-ditch battle against the entire program.

Noorlag saw the industry's competitors in the railroad companies at the heart of the quandary facing the truckers:

Unfortunately, that is what the railroads want the truckers to do so that the truckers would be blamed for killing the highway measure which the scheming railroads had set out to do by "hook or crook."

By early 1956, the truckers, oil industry, and others had agreed on a schedule of tax increases that included a 1-cent increase in the tax on gasoline and diesel, 3 more cents on a pound of rubber, and a 2-percent additional excise tax on new vehicles. With compromises in place, Representative Hale Boggs (D-La.) of the Ways and Means Committee developed legislation that would dedicate all highway user tax revenue to highway development by crediting the revenue to a new Highway Trust Fund. The fund was modeled on the Social Security Trust Fund, as suggested by Treasury Secretary Humphrey.

The revised Fallon-Boggs Bill passed the House by a vote of 388 to 19 and was sent to the Senate for consideration. As *The New York Times* pointed out in its article the following day, the one-sided vote "was attributed for the most part to the changed attitude of lobbies, mainly the trucking industry." The article explained:

The truckers and others, including representatives of tire manufacturers, were said to have been won over by revision of the tax proposals to scale down their share of the increased burden.

The final bill was a combination of the Gore Bill and the Fallon-Boggs Bill, plus changes by the Conference Committee of the two Houses. It passed the House and Senate with little difficulty. With President Eisenhower's signature on June 29, 1956, the Federal-Aid Highway Act of 1956 would launch the Interstate System that would have profound impacts on freight transportation in the United States.

Traffic and Travel Trends, 1955

A detailed picture of trucking is available for 1955, the year before construction of the Interstate System began in earnest. The BPR magazine *Public Roads* published an article in its December 1956 issue on "Traffic and Travel Trends, 1955." In addition, the report on the Highway Cost Allocation Study required by Section 210 of Title II (Highway Revenue Act) of the Federal-Aid Highway Act of 1956 included information on the state of trucking in 1955.

In the *Public Roads* article, Thomas B. Dimmick, head of the BPR's Current Data Analysis Unit, contrasted 1955 truck traffic with traffic in 1936. He chose 1936 as the base year because that was when the comprehensive highway planning surveys had begun, making extensive data available. As he explained:

The measuring of road mileages, the counting of traffic and classification by vehicle type, the weighing of trucks on rural roads, and the questioning of drivers concerning origin and destination of trips and mileage driven on different road systems during the preceding 12 months, supplied basic data from which a vast amount of information regarding travel habits, ton-miles hauled on rural highway systems, and vehicle-miles driven on all road systems could be determined for the period of the study.

Later advances, such as installation of automatic traffic counters and periodic weighing operations, allowed for continued collection to update the data.

Dimmick reported that except for the war years and the few years after the war, "the trend of total travel follows closely the economic trend as represented by the Gross National Product." Passenger-car and bus travel on main rural roads had increased by 147 percent since 1936. For single-unit trucks, the increase was 154 percent, while truck combinations increased 455 percent. For the shorter time frame of 1950 to 1955, single-unit truck traffic had increased 18 percent and truck combinations by 22 percent.

[PR Figure 5, p. 104]

The abstract accompanying the article summarized the truck data from a special survey in 1955 during which 519 loadometer or pitscale stations were operated in 44 States to gather data on vehicle types, weights, and loading practices. Most of the stations were in the same locations as those used during the 1936-1940 statewide surveys. Approximately 135,000 trucks and truck combinations were recorded. The summary stated:

A special survey undertaken during the summer of 1955 indicated that 73 percent of the truck travel on main rural roads was performed by private haulers, and the remaining 27 percent was by for-hire carriers of which 18 percent had ICC authority numbers. Of the total truck travel on main rural roads, approximately 30 percent involved trips in more than one State; the remaining 70 percent were intrastate trips made largely by private haulers.

In 1955, 55 percent of all freight-carrying vehicles were loaded, and weighed an average of 24,336 pounds. The weight of empty vehicles averaged 9,426 pounds. For the period 1950-55, weights of loaded single-unit trucks increased 3 percent, whereas combinations increased over 6 percent.

Single-unit trucks in 1955 carried loads during 48 percent of their travel as compared with 60-65 percent during the prewar period 1936-41. Combinations in 1955 were found to be loaded during 68 percent of their travel as compared with 72 percent in 1936.

[PR Figures 7 and 8, p. 106]

Dimmick explained that the decline in loads for single-unit trucks reflected their increased use for personal transportation rather than hauling. By contrast, the use of loaded combination trucks that were not suited to personal transportation had been fairly stable. He continued:

Average loads carried by single-unit trucks increased from 1.86 tons in 1936 to 2.47 tons in 1955 (33 percent increase), while combinations increased from 6.90 tons in 1936 to 11.07 tons in 1955 (60 percent increase).

Ton-mileage hauled in 1936 by single-unit trucks was 14.3 billion as compared with 38.5 billion in 1955; combinations in 1936 hauled 13.7 billion ton-miles as compared with 115.6 billion in 1955. The two-axle, six-tire trucks, the principal load-carrying single unit trucks, accounted for 26 percent of all truck travel in 1955, and 17 percent of the ton-mileage hauled; truck-tractor and semitrailer combinations accounted for slightly less than 30 percent of the travel, but carried nearly 68 percent of the ton-mileage.

Frequencies of freight-carrying vehicles weighing 30,000, 40,000, and 50,000 pounds or more reached a new high in 1955. Since 1936 the number of trucks in each 1,000 and empty vehicles weighing 30,000 pounds or more have increased almost 5 times; for 40,000 pounds or more, over 11 times; and 50,000 pounds or more, 25 times. From 1950 to 1955, the frequencies increased 10, 16, and 29 percent, respectively.

The frequencies of axles weighing 18,000, 20,000, and 22,000 pounds or more show an increase in 1955 over 1954, but for the period 1950-55, there has been a decrease of 9, 20, and 35 percent in the three respective axle-weight categories.

Dimmick also reported a change that affected the impact of trucks on pavements. In general, trucks do not affect pavements because of their weight, but because of how the weight is distributed. The same weight carried on two axles or several axles will affect the roads differently by changing the "loadings" on the pavement. Although freight volumes had increased over the years, Dimmick reported an overall downward trend in heavy axle-weight frequencies. He explained that, "By a shift to vehicles with a larger number of axles, trucks are hauling more and heavier loads over the highways and yet subjecting them to less frequent applications of heavy and destructive axle loads."

[PR Figure 10, p. 108]

Highway Cost Allocation Study

As reflected in the testimony of Mr. Behling of the AAR and the reaction of the ATA to Representative Fallon's tax proposals, one of the controversial issues confronting Congress in 1955 and 1956 was how much highway users should pay for the Interstate System. In a compromise, Section 210 of Title II of the Federal-Aid Highway Act called for information "on the basis of which [Congress] may determine what taxes should be imposed by the United States, and in what amounts, in order to assure, insofar as practicable, an equitable distribution of the tax burden among the various classes of persons using the Federal-aid highways or otherwise deriving benefits from such highways."

The resulting Highway Cost Allocation Report, released in 1961, was the first in a series of such reports that Congress has requested. (The most recent, issued in 1997, and a 2000 addendum can be found on line at <https://www.fhwa.dot.gov/policy/otps/costallocation.cfm>). The 1961 report contains a wealth of information on the state of trucking and freight movement in the United States at the start of the Interstate era. The data reflect Dimmick's 1955 special study, which covered main rural roads, plus studies conducted under Section 210 for other rural roads and city streets.

The report discussed overall intercity freight traffic:

Throughout the period 1929-58 the railroads have been the principal carriers of intercity freight. Traffic transportation by rail in 1956 amounted to 655.9 billion ton-miles, a 44-percent increase over the level of 1929. Although railroads have increased the volume of their traffic since 1929, their relative position as carriers of intercity freight has deteriorated, both before and after World War II. Since 1953, the railroads have carried less than 50 percent of total intercity freight traffic - as opposed to 75 percent in 1929. As a result of the changing traffic pattern and the greater absorption of increased traffic by carriers other than rail, the division of traffic has shifted recently (1958) to the following:

- Rail, 46 percent;
- Highway, 20 percent;
- Inland waterways, 16 percent; and
- Pipeline, 18 percent.

The report found that "in recent years competition among the various transport media has been increasingly keen for various types of freight." The trend for "high-rated" merchandise was illustrative of trends at the start of the Interstate

era. The term "high-rated" referred to commodities that commanded high haulage rates in relation to their weight because of their high value, low density, fragility, or perishability. The report stated:

The railroad have maintained their traffic in heavy-loading commodities, but high-rated, low-density merchandise traveling on short hauls represents the railroads' initial and principal loss to motor carriers. Much of the high-rated traffic for medium and long distances, including transcontinental hauls, has also been diverted to trucks.

The report added:

Railroad freight traffic has declined in all general commodity classifications, but especially in less-than-carload lots, in animals and in manufactures and miscellaneous goods. These three represent the greatest losses in both the prewar and postwar periods.

These trends were reflected in a review of specific products, such as iron and steel products and transport of new motor vehicles, that had shifted from rail to road.

[Study Figure V-2, p. 250]

In short, a "persistent trend" was resulting in "highway carriers [taking] over increasing percentages of the movement of certain classes of products":

Although their most advantageous field of activity is still the short-haul movement of high-rated cargoes, they are competing with the railroads in lengths of haul of 250 to 1,500 miles in the refrigerated hauling of fresh fruits and vegetables, in the hauling of canned fruits and vegetables, and in other cargo movements. Furthermore, they have shown marked progress in recent years in getting an increasing share of the business of moving commodities of lower rating, such as petroleum products, grain, and steel products.

The "persistent trend," the report found, was likely to continue:

The progressive improvement of modern, high-speed, controlled-access highways, particularly on the Interstate System, should, by reducing time of travel, fuel consumption, and other operating expenses, improve the competitive position of the motor carriers of freight.

Each mode "has certain advantages that its rivals lack." As a result, each carrier would have to develop its inherent qualities to offer better transportation than its competitors:

Trucks are more flexible in operation than any other land carrier. More frequently they are able to provide door-to-door delivery service, eliminating much of the expense of handling and transferring loads between carriers. They have access to many areas not served by other modes of transport so their range of operations is broader. For short hauls and many medium length hauls, they are faster and more economical than rail.

Railroads, on the other hand, are particularly capable of transporting carload lots for long distances at relatively low rates. Rail carload shipment is so important to industries that convenience to rail facilities weighs heavily in determining plant locations. Railroads, in some instances, have furnished warehousing facilities at nominal costs to supplement industrial and commercial storage areas. They specialize in the movement of many bulk commodities. Much of the rail rolling stock is designed to transport specific types of goods economically and efficiently in larger lots than trucks can handle and faster than inland waterway transportation.

One trend that was making "significant strides" in recent times combined the advantages of truck and rail, namely "the development of trailer-on-flatcar operations, popularly known as piggyback." It combined "the low-cost line-haul advantages of rail and the flexibility and convenience of door-to-door features often associated with motor-carrier operations." The report provided a bit of history:

Initiated in 1934, piggyback service had little influence on transportation until about 1953. By June 1959, 50 railroads in the United States originated trailers on flatcars and an additional 38 were involved in piggyback tariffs. Annual flatcar loads of trailers increased 148 percent from 1955 to 1959, or from 168,160 to 416,508. Although still only a very small share of the annual rail freight movement, it is noted that during the 1958 business recession piggyback service expanded at a time when freight car loading declined.

For purposes of highway cost allocation, the piggyback trend could affect the cost attributable to trucks. "No doubt the extent of diversion of large truck trailers from the highway will affect the adequacy and capacity of highways for passenger cars, the amount of highway-user receipts and the distribution of receipts from different classes of vehicles." It would also affect the number of loadings a pavement would receive, and thus the cost of providing a good pavement for all motor vehicles.

Forecast

Based on a "knowledge of past performance together with an awareness of the present situation and anticipated developments," the report projected traffic trends over the coming 20 years. Total intercity freight ton-miles was expected to double, jumping from 1,500 billion in 1960 to 2,950 billion ton-miles in 1980. The percentage increase by mode was expected to vary.

Truck traffic is estimated to climb 131 percent from 281.6 billion ton-miles in 1960 to an estimated 651 billion in 1980... Rail traffic is expected to increase about 76 percent from the 1960 estimated amount of 742.9 billion ton-miles to the 1980 estimate of 1,307.3 billion ton-miles.

The report used an "analysis year" of 1964 to provide a basis for realistic projections:

Total gross ton-miles will rise from 1,279.8 billion in 1957 to 1,798 billion in 1964, an increase of 40 percent. The vehicle miles of trucks and combinations as a group are expected to increase by 38 percent, and their gross ton-miles by 43 percent. More indicative of the growth of intercity motor-carrier freight movement is the comparison for combination vehicles, for which the predicted increase in ton-miles is 49 percent, from 400.2 billion in 1957 to 596.7 billion in 1964.

The report concluded that the Federal-Aid Highway Act of 1956 "will promote the national welfare and economy, will affect the future development and competitive aspects of transportation, and will confer benefits on both users and nonusers that will more than repay the cost of the program." Expanded gross national product would result in an accompanying increase in total demand for freight transportation. Mainly because of the Interstate System, "the additional demand will be attracted in large part, although by no means entirely, to motor transport." In particular, bulk commodities and other cargoes "relatively unsuited to highway transport," were not expected to change method of shipment:

The generated traffic in such commodities should yield revenues to rail, waterway, and pipeline carriers that will offset their losses of certain marginal traffic to motor carriers. No widespread shift of present traffic from one mode of transport to another as a result of the highway program is anticipated.

Beyond Calculation: Five Decades of Change

The Dimmick article and the 1961 report on the Highway Cost Allocation Study provide a detailed picture of motor carrier transportation as part of the larger freight industry as construction of the Interstate System began under the

Federal-Aid Highway Act of 1956. The competition among modes, particularly trucks and rail, was recognized at the time, as were the advantages the Interstate System would give trucks.

However, shippers will inevitably gravitate to the mode that can make deliveries fastest at the lowest cost. Although the Interstate System would affect the calculation, it was only one of many factors affecting freight transportation this past 50 years. Other factors include political changes, such as the demand for deregulation, the changing price of oil, the export of manufacturing jobs to Asia and other low-wage countries with a concurrent shift from an industrial to an information age, development of a global marketplace, the doubling of population, and the North American Free Trade Agreement.

These and other factors were, of course, unforeseen by the authors of *Toll Roads and Free Roads* and *Interregional Highways*. Thinking that their proposal would create construction jobs for returning soldiers to avoid a return of the Depression after the war, they could not have anticipated the postwar economic boom that continues to this day, the Baby Boom and a succession of baby boomlets that fed a population explosion, or the societal changes that would affect the ability of the Interstate System to address the problems they expected it to solve. The changes were not foreseeable by the leaders who created the Federal-Aid Highway Act of 1956. The authors of the report on the Highway Cost Allocation Study based their predictions on projections of the solid data of past and present, not a knowledge of how society would be transformed.

President Eisenhower, in a memoir of his first term, *Mandate for Change 1953-1956* (Doubleday & Company, 1967), predicted of the Interstate System:

Its impact on the American economy - the jobs it would produce in manufacturing and construction, the rural areas it would open up - was beyond calculation.

His prediction was literally true, for no one at the time predicted the many ways the Interstate System would affect the country, including how it would affect freight transportation.
