Transportation and the Marketplace

The revolution in transportation occurred during the six decades after 1920 exceeded in magnitude that which took place between 1820 and 1860. The internal-combustion engine, cheap gasoline, and mass production placed the automobile in the hands of virtually every family, and, as a result, the long-distance passenger train and mass transit almost died. Expansion of the federal and state highway systems provided intercity trucks with the means to compete with, and then largely surpass, freight trains as carriers for all but bulk commodities.

By the 1950s, airlines provided expensive but fast service between major cities, and by the 1970s, they moved millions of travelers at relatively low fares. The nation's pipelines, barge operators, and intercostal shipping companies carried larger and larger volumes of petroleum products, coal, and grain. The federal government subsidized the new transportation forms with improved highways and waterways and often with direct cash subsidies, yet it developed no plan for an integrated national transportation system.

Ironically, large segments of the great rail network that had pioneered in big business fell into physical disarray and fiscal chaos. The plight of portions of the rail network and the success of other carriers can evident in the divergent histories of the Pennsylvania Railroad and the Union Pacific Railroad.

In the 1890s a leading railway security analyst, Van Oss, declared, "The Pennsylvania is in every respect the standard railway of America." He praised its management, locomotives, cars, track, terminals, and operations. The Pennsylvania made large profits and came to control the Norfolk and Western, Wabash, Lehigh Valley, and other competitors in the East. The Pennsylvania prospered in the 1920s and during the Great Depression electrified its main lines from Washington and Harrisburg through Philadelphia to New York.

World War II brought record traffic volume and greater prosperity, but after 1945, problems developed. The Pennsylvania paid high property taxes on its yards, terminals, and trackage; competing truck lines were taxed only on their trucks. The management spent hundreds of millions of dollars on new streamlined passenger trains even as the subsidized airlines took away passengers. The railroad remained labor intensive, and federally approved wage rates rose faster than freight rates. Expensive terminal operations, short hauls for freight, the cost of dieselization, huge losses from passenger and commuter services, and managerial laxity caused the Pennsylvania to fail rapidly.

Industry fled the Northeast to the South and West, and traffic on the line declined drastically. By the 1960s, the railroad was surviving only because of real estate holdings and dividends from the securities of other companies. As railroads sought relief from these problems, they turned to mergers as a solution. The Pennsylvania divested itself of its holdings in other carriers so that it could merge with its long-time rival, the New York Central. The Penn-Central merger of 1966 proved disastrous.

The old Pennsylvania management ("the Red Team") and the New York Central managers ("the Green Team") refused to cooperate, and even their computers were incompatible. Losses mounted and bankruptcy came in 1970. The federal government, moving to prevent the collapse of the nation's largest railway, created Conrail (the Consolidated Rail Corporation) in 1976 to salvage the Penn-Central and other bankrupt lines in the Northeast. Over $4 billion in federal loans kept Conrail operative. Yet the vastly expanded Norfolk and Western and the Chesapeake and Ohio System operating in the same region remained strong, profitable railroads, as did the Union Pacific in the West.

In 1987, a vastly reduced but profitable Conrail, rid of excess track and with new labor agreements, was sold by the government through an offering of securities to the public. Even as S. F. Van Oss wrote about the Pennsylvania as the "standard" railroad in the 1890s, the Union Pacific needed rapid modernization. Debilitated financially, threatened competitively by the Southern Pacific, and blocked from reaching California, it appeared to some a hopeless wreck.

Financier E. H. Harriman of the Illinois Central bought control of the Union Pacific after it entered bankruptcy in 1897 and rebuilt the property. New locomotives and cars moved over revamped tracks, and Harriman acquired a line to Los Angeles. Although Harriman's efforts to create a rail monopoly in the West failed, he made the Union Pacific a rail showcase. The company prospered in the 1920s, and World War II brought more prosperity.

The postwar era saw dramatic changes in the corporation. Because of its land grant, the Union Pacific held substantial coal, petroleum, and timber reserves that the railway began to exploit. It purchased a large independent oil firm and created a holding company for both its rail and non-rail properties. The company ended most passenger service, took ad- vantage of its long-haul freight lines, especially for piggyback trailer traffic, and by 1980 earned 16 percent on its equity.

The success of the Union Pacific repeated on the Santa Fe, Southern Pacific, Southern, Burlington Northern, and other railroads. The rail industry as a whole declined, however, and by 1980 some lines in the mid- west were following several northeastern carriers into the federal bankruptcy courts. The plight of the nation's railroads received considerable attention, but little was done. In 1945, the railroads had hauled 60 percent of freight ton-miles; by 1980, they carried less than 30 percent.

The federal government did create Amtrak (National Railroad Passenger Corporation) to operate a few long-distance passenger trains, thus relieving the carriers of that obligation. The moribund ICC stirred slowly and allowed more rapid freight rate increases, but the railroads' return on equity was still less than 1 percent; twenty-one of the seventy-one largest railroads in the United States lost money in 1970. Deregulation became another panacea, as did rapid abandonment of duplicate and unprofitable mileage.

The newly created Department of Transportation sought to devise a national rail plan, but political interference, labor opposition to consolidation, and bureaucratic ineptitude precluded meaningful efforts to rescue the weak elements of the industry and strengthen the profitable carriers. The railroad industry responded with a series of megamergers that reduced the Class I systems to only fourteen by 1988. By the end of the 1970s the federal government had spent over $100 billion for highways and more than $15 billion for waterways, but the railroads could raise only $5 billion for private investment in the decade of the 1970s as capital became more difficult to obtain when profit levels fell.

The Staggers Act of 1980 provided the railroads with relief from crippling regulations and allowed for flexible ratemaking. Ironically, the automobile industry, which had helped to create the railways' problems, also had to seek help from Washington in the 1980s.

THE AGE OF THE AUTOMOBILE

The automobile represents one of the most significant elements of the American culture and economy. President Warren G. Harding told Congress in 1921 that "the motor car has become an indispensable instrument in our political, social, and industrial life," and a resident of "Middletown" exclaimed to the inquiring sociologists Robert and Helen Lynd, "Why on earth do you need to study what's changing the country? I can tell you what's happening in just four letters: A-U-T-O." Wags joked that the car had taken sex off the front-porch swing and into the rumble seat of the Model T, but Wall Street knew that the internal-combustion engine and mass production had vastly altered the economy and created an industry that, with its auxiliary enterprises, employed millions of workers.

In only a quarter of a century, the transportation market witnessed a revolution of massive proportions. The coming of the automobile set forces in motion that helped establish a consumer-goods economy. The car manufacturers introduced new production and marketing methods—the moving assembly line and installment buying, for examples—that changed the national economy.

The automobile created demands for gasoline, lubricating oil, steel, glass, and rubber, and for better and expanded highway and street systems. Cars and buses made possible the consolidation of rural schools and the establishment of regional shopping centers. The suburb blossomed with expanded automobile ownership. Henry Ford put it this way: "We shall solve the city problem by leaving the city."

As in so many other matters, Ford was dead wrong! However, there can be no doubt that the automobile industry provided one of the basic ingredients for the creation of the American middle-class culture. Few visitors to Chicago's Columbian Exposition of 1893 could visualize the implications of the six cars displayed by their builders. The next decade saw the construction of a successful gasoline engine by the Duryea brothers and a demonstration of the auto's durability in a road test from Cleveland to New York in 1897.

After 1900, the auto came of age as the number of builders reached the hundreds and output could be measured in the tens of thousands. By 1910, auto manufacturing had become the twenty-first largest enterprise in terms of product value, and 458,000 cars were registered in the United States. A mass market had been created. The automobile industry developed under ideal circumstances.

The United States had a higher per capita income than Europe and a broader distribution of income. Some industries that already served mass markets had established the concepts of mechanization and standardization to lower production costs. The demand for cars exceeded the supply for over a decade, and buyers paid cash before delivery, providing working capital for the manufacturers.

Only a modest plant was needed to build the cars, and some models were assembled from parts furnished by suppliers. Ford Motor Company began with $28,000 in paid capital, and in 1909 Hudson Motor Car Company received deposits from its dealers equal to one-half of its annual production costs. Many of the early builders were well-trained engineers with extensive experience in related industries—bicycles, carriages and wagons, and locomotive building. Thus, as credit and capital came easily, the number of manufacturers rose rapidly.

Profits reinvested in plants and new production lines enhanced output, thereby reducing per unit costs and prices. As some of the companies increased in size, they began to manufacture components rather than make purchases from sup- pliers. Henry Ford's Highland Park plant, which opened in 1910, became the basic model for the industry. The smaller manufacturers often merged to form larger companies, and by 1912, only seven firms were building over half of all cars.

Henry Ford did not originate the concept of mass-marketing cars; much credit can be given to Ransom E. Olds and the curved-dash Oldsmobile of 1901—1904. Sold for only $650, the Olds became America's first popular car. Two Oldsmobiles raced from New York to Portland, Oregon, in 1905—in only forty-four days—and the public recognized that an American car was as reliable as a European import.

Olds manufactured cars with a new technique of assembly, bringing materials to the workers rather than workers to the materials. By 1904, he was producing 5,000 cars and paying dividends of 105 percent in three years. Olds split with his financial backers, who wanted higher-priced products, while he sought to lower prices and further develop a mass market. What Olds sought, Ford achieved.

Henry Ford introduced his Model T in 1908 and reshaped the industry. His first car was built in 1896, and seven years later, he formed Ford Motor Company. When he introduced the Model N in 1906, Ford was deluged with orders and soon was building 100 cars per day. With the Highland Park plant in full production, he reduced the price of the Model T to $345 in 1916. By that year, Ford had sold 734,811 Model Ts, almost half of all cars sold in the United States.

Economies of scale could drive the small producers out of the market, but Ford did not attempt to create a monopoly; an oligopoly was much better, he said. The moving assembly line, added to Highland Park in 1913, represented Ford's genius at its best, but his creation was part of an ongoing evolution in mass production. He made a good product at a low price that allowed for large-scale distribution; standardization meant lower prices and any color the customer wanted—as long as it was black.

Ford opposed the trend toward higher-priced cars and in the process helped transform America. In 1914, production of motor vehicles exceeded the production of wagons and carriages for the first time. The oligopolistic trend in automobile manufacturing accelerated with by William C. Durant in 1908. Billy Durant took over the failing Buick Motor Company in 1904 and soon made it the largest-selling car.

The Buick was a high quality, reliable auto and became the backbone of Durant's empire. Like Ford, he saw the need for large-scale capital for the mass production of nonluxury cars, but unlike Ford, who created a single corporation to build one product, Durant favored mergers of several companies to blanket the market with cars in all price ranges. The "flamboyant" Durant had been in the carriage business for almost two decades, and like so many other carriage and wagon builders made the step from that enterprise to automobiles. Determined to build an integrated company with Buick as its basis, he began trying to consolidate his company with Ford, Maxwell, and Reo, but Durant could not raise the necessary cash. Instead, he brought together his own Buick with Cadillac, Oldsmobile, and Oakland in an enterprise he called General Motors Corporation. Capitalized at $10 million, General Motors (GM) almost failed when automobile sales declined in 1910.

Durant was forced to borrow nearly $13 million from Wall Street bankers, and control of General Motors passed into a voting trust. In 1915, however, Durant came back to GM aided by the Du Pont family, with whose support he had also acquired control of Chevrolet Motor Company. The Du Pont family invested almost $50 mil- lion in GM, and Durant continued to acquire more and more units. As a result, GM again came close to bankruptcy when sales of automobiles col- lapsed at the end of World War I. Once more Durant was forced out, and the Du Pont family and the House of Morgan took over.9 One of Durant's acquisitions for GM was Hyatt Roller Bearing Company headed by Alfred P. Sloan.

Sloan became an executive with General Motors, and he impressed the Du Ponts. Pierre Du Pont, who succeeded Durant as GM president, recognized that Durant's erratic managerial style and uncontrolled acquisition policy had created the fifth largest of all industrial enterprises in the United States, but he also realized that it had created an industrial empire without a structure. Many talented young GM executives, men like Charles W. Nash and Walter P. Chrysler, left GM because they were unable to determine what policies Billy Durant wanted them to carry out. Two days before the end of 1920, the board of directors of GM approved a plan proposed by Alfred Sloan that created the structure that became the corporation's essential organization.

Sloan's plan made GM a single coordinated enterprise by creating a general office to set broad corporate goals and policies for the many operating units. Sloan argued that the operating divisions had to retain some autonomy, and that a very centralized structure would not work given the size of GM. He firmly believed that independence encouraged innovation and initiative. On the other hand, some activities had to be coordinated in the best interests of the entire corporation.

Sloan established clear lines of authority, sought to determine actual costs and profits for each division, and created a procedure whereby performances of one unit could be measured against those of other units. The general office would be concerned, not with details in the divisions, but with a flow of general information that could be used to make decisions about unit efficiency in the allocation of corporate resources. Each division would be placed in a logical relationship with the others, and the overall administrative office would set the policies for the multifunctioning autonomous operating divisions.

The activities of GM would be based on market forecasts of demand and estimated economic conditions. Finally, Sloan defined for the different divisions their function in the marketplace. Chevrolet would compete directly with Ford; Buick, a more expensive car, would be aimed at the middle of the market, as would the Oldsmobile. The Cadillac division, while producing the most expensive models and the fewest number of cars, often made good profits. In the mid-1920s, the Pontiac was introduced to fill the need for a quality car priced between the Chevrolet and the Oldsmobile.

General Motors achieved the goal of including in its product line "a car for every purse and purpose." Sloan provided a structure for GM that was designed to carry out the market strategy required after 1920. One student of the automobile industry has argued that the supply of entrepreneurs in the United States was so vast that the importance of any individual contribution was negligible: "Individual entrepreneurs, whether alone or as archetype, don't matter." Yet the Sloan plan demonstrates that business leadership is an essential, and in many cases the most meaningful, factor in the growth of the automobile industry.

General Motors, not Ford, established the industry pattern, that is, annual model changes and production by one firm of a full price range of vehicles through a wholly decentralized organization. Ironically, Ford Motor Company itself would adopt this pattern in the 1930s. However, in the 1920s Henry Ford refused to accept the changing strategy adopted by GM. Angered by demands of Ford stockholders that a portion of profits be returned to them, Ford went heavily into debt to repurchase securities owned by non-Ford family members. The Dodge brothers, for example, received $35 million for their shares of Ford, which represented an original investment of $20,000.

Ford acquired total control of his company, but the decline in sales and falling prices brought Ford to the brink of disaster in 1920. Refusing to produce new models or to alter the Model T, Ford faced catastrophe. With a $75 million bank loan due in 1921, Ford dealt with the problem by canceling all orders for materials and supplies, closing his factories, and shipping 125,000 cars to his dealers. The dealers were told that they must pay cash for the cars they had received or lose their franchises. Virtually all of the 17,000 Ford dealers responded, many at a significant loss to themselves, for their franchises were too valuable to be abandoned. When the inventory had been depleted, and as car sales began to rise, Ford reopened.

Prosperity returned after 1920. Over 2 million cars were marketed that year, and the automobile boom peaked in 1929 when 5,337,000 cars were sold. Automobiles used 20 percent of all American steel, 90 percent of the gasoline produced, and 80 percent of the rubber, but by 1925 overproduction of automobiles had become an increasing problem. Ford's Model T dominated the market until 1923, but it declined seriously after that, falling from 46 percent of sales in 1923 to 9 percent in 1927 before the introduction of the Model A.

General Motors prospered throughout the 1920s, as did Chrysler, which became the third-largest producer. Walter Chrysler had worked on locomotives and become the manager of the American Locomotive Works in Pittsburgh before joining General Motors in 1911. A brilliant young executive, Chrysler eventually quarreled with Billy Durant and left. He saved the ailing Maxwell Motor Car Company and introduced his own make, the Chrysler. The Maxwell and the Chrysler were so successful that he soon acquired Dodge from the Dodge brothers, and before the end of the decade introduced the Plymouth and the De Soto, following the strategy of General Motors of having a car line in all price ranges.

Throughout the 1920s, many of the small automobile manufacturers either went out of business or were merged into the larger firms. Advanced advertising techniques, emphasis on automobile purchases with credit, and new models every year made automobile manufacturing the nation's number-one industry. With over 26 million cars clogging the highways and streets, America became a car culture in the 1920s.

THE RISE AND DECLINE OF STUDEBAKER

Henry and Clem Studebaker entered the wagon business in South Bend, Indiana, in 1852 with $68 in capital and two sets of tools. Their father John had built Conestoga wagons, and his sons soon prospered in the trade. By the 1860s, they were worth $10,000, largely because of federal contracts for wagons during the Civil War. The Studebakers produced strong, well- constructed wagons, carriages, buggies, and delivery vehicles, and in the 1870s, they were doing a million-dollar business yearly in the world's largest vehicle plant. Even as Studebaker wagons became part of America's export trade in the late 1890s, a second generation of Studebakers built an experimental automobile. In 1902, the company offered an electric car in five models, and it sold 20 units the first year; a gasoline version entered the market two years later.

Sleds, wagons, and buggies still constituted the major source of sales in 1907, when the company achieved $7 million in revenue, but a commitment to the automobile led to a reorganization in 1911. The family purchased the E.M.F. Corporation, a major automaker, in 1909 and placed a new emphasis on car production. What had been a sideline became the central focus of the company. Studebaker soon exported 37 percent of all American cars sold abroad, and the coming of war brought vast orders for trucks, including one order for 5,000 military caterpillar trucks.

Studebaker prospered, paid off all loans in 1917, and declared a 10 percent dividend. Two years later wagon building terminated, and a new car plant in South Bend made the company the nation's third-largest auto producer. One reason for the great increase in sales was Studebaker's decision to sell cars on credit. As early as 1911, it accepted car notes endorsed by its dealers, thus making high- priced automobiles available to more buyers. Studebaker's postwar output peaked in 1923, with sales of 145,167 units.

The company, seeking to cover the entire market, purchased luxury-car- builder Pierce-Arrow in 1928. Management of Studebaker, which had passed from the family, proved to be ineffective as sales plummeted after 1929. New models failed to attract buyers, yet a large cash dividend was paid from capital in 1931. Purchase of White Motor Company led to Studebaker's receivership two years later. Reorganization by a strong, young management team put Studebaker in the black by 1938.

World War II demands aided the financial recovery. Studebaker built trucks and aviation motors, and it resumed dividends in 1943. With $33 million in working capital, Studebaker reentered the car market in 1946, and it soon produced "radical" new models. Sales reached 334,554 cars and trucks in 1950, but like all of the independents, market penetration declined. Desperate for survival, Studebaker merged with Packard Motor Car Company; the sales decline accelerated. Finally, in 1964, the South Bend plant closed and small-scale production was transferred to Canada, but even that effort failed.

Like Willys, Hudson, Packard, and Nash, Studebaker could not build models in all price ranges to compete with the Big Three (General Motors, Ford, and Chrysler). Short of capital and with its weak dealer system, Studebaker failed to survive in the postwar car market. The most significant change to take place in the industry in the 1930s was the coming of unionization when Franklin Roosevelt's New Deal and the Depression drastically altered labor relations in the automobile industry.

The National Industrial Recovery Act established the National Recovery Administration (NRA), which drafted industrial codes to get the nation's economy moving. Section 7A of the code required businesses participating in the NRA programs to allow their workers to bargain collectively. The automobile companies resisted strenuously, but the New Dealers forced the manufacturers to sign the agreements. Young labor activists in the American Federation of Labor (AFL) set out to organize the automobile industry with a broadly based industrial union. The leadership of the AFL, however, unwilling to accept any labor organization based on anything other than skills, forced those with such beliefs from the union.

After the NRA had been emasculated by Supreme Court decisions, the Wagner Act, or National Labor Relations Act, again created a structure that allowed for the growth of industrial unions. The beleaguered employees joined the United Automobile Workers union (UAW), and through sit-down strikes and major work stoppages forced General Motors and Chrysler to bargain and recognize the union.

Ford's resistance produced violence as the company hired a private army of detectives and thugs in an effort to thwart unionization. This brought intervention by the National Labor Relations Board (NLRB). An NLRB election led to an overwhelming pro-union vote by Ford workers, much to the distress of the elder Ford. Thus, prior to World War II, the automobile industry was unionized. From 1940 to 1945, the automobile manufacturers shifted to wartime production. Their plants produced tanks, trucks, jeeps, and other military hardware. Each month saw increasing records of production and in five years the automobile manufacturers would build more than 4 million engines, almost 6 million guns, and almost 3 million tanks and trucks in addition to thousands of aircraft, millions of rounds of ammunition, and a host of other military products.

When the war ended in 1945, the companies moved quickly to convert to civilian production. Consumers with cash stood ready to buy the first cars off the production line, and automobile dealers were swamped with customers placing orders for new cars. There were only nine automobile companies in the United States in 1945: General Motors, Ford, Chrysler, Studebaker, Hudson, Packard, Nash, Kaiser-Frazier, and Crosley. The companies rushed to fill the demand for automobiles created by the war, but strikes and the lack of materials prevented full-scale production until 1947. Studebaker and Kaiser- Frazier brought out new models, but not until 1949 did Ford drastically alter its line.

The Korean War of 1950 again limited production, and only in 1953 did output reach pre-1940 levels. However, that year strikes and failure to obtain transmissions grievously harmed the independents. Nash, Packard, Kaiser-Frazier, Hudson, and Studebaker saw sales plummet. The grossly undercapitalized Kaiser-Frazier withdrew from the automobile market in 1955. Hudson, which had won a good share of the market with its "stepped-down" design of 1948, failed to change its styling and merged with Nash, whose lumbering design had lost public favor.

Packard, which had never recaptured the luxury market after the war, merged with Studebaker, whose "radical" designs had not been well received. The two new independents, American Motors (Hudson-Nash) and Studebaker- Packard, could not regain large shares of the market. The latter would leave the automobile business, and the former would continue as a marginal producer of compact cars. General Motors dominated the domestic market after the war, with Ford a distant second.

By 1945, Ford Motor Company was an administrative disaster. Henry Ford had fired or emasculated anyone who showed initiative within the firm. It was that year that young Henry Ford took control of the business. He hired Ernest R. Breech who brought the company back from the edge of catastrophe. The company's medieval structure was reorganized and its primitive accounting system replaced.

Its product was poor, but it had over $600 million in cash in the bank. Breech saved Ford, challenged General Motors' lead, and only the disastrous Edsel marred the generally positive emergence of Ford after 1947. Chrysler Corporation never regained its pre-1940 position, however. From a 25 percent share of the market in 1946, its sales fell to 9 percent by 1962. Stylistic rejection and a reputation for poor quality harmed the company. Efforts to develop a worldwide market led to huge losses outside the United States.

Chrysler seemed unable to compete with General Motors and Ford at home or abroad.14 In the 1970s all three major car companies faced intensive competition from imports. The trickle of imported sports cars of the 1950s became a flood of compacts, trucks, and family cars. Imports represented only 7 percent of the market in 1960, but almost 30 percent by 1980. The imports captured larger shares of the market with models that were more economical and were reputedly of higher quality of construction.

Reluctance of the domestic manufacturers to produce compact models with fuel-efficient motors created a vacuum that the imports filled. In 1979, Chrysler had to call on the federal government to guarantee loans to stay in the automobile business, and General Motors and Ford admitted that they had lost money in the domestic market. All three producers blamed federal regulations and high labor costs for declining sales. Yet foreign models had to meet the same pollution and safety requirements.

Wage scales and fringe benefits in Japan were lower than those of American workers were, but consumer preference based on qualitative judgments rather than price seemed to be the main reason for the boom in imports. The sickness of the American auto- mobile industry began to have a sharp negative impact on the national economy. That impact could be seen not only in the industries that sup- plied materials to the builders but also in the service industries that had developed to meet the requirements of cars, trucks, and buses.

The economic difficulties of Chrysler Corporation in 1979-1982 pointed to the extreme risks in the industry. Vast shifts in taste and sales often occurred even as the companies planned to enter certain phases of the marketplace. The greatest example of such a disaster was Ford Motor Company's introduction of the Edsel, and yet that same firm could note the substantial achievement of the Mustang. When the manufacturers introduced compact cars in the early 1960s, a market was found, at least initially. The Ford Falcon sold 480,000 units in 1961, but only 110,000 six years later.

General Motors' Corvair in 1965 sold over 200,000 units; in 1967, only 25,000 were sold. The Chrysler Corporation was able to market only 80,000 full-sized Chryslers in 1960, but six years later consumers purchased 230,000 Chryslers. Fluctuations of 75,000 to 100,000 units per year were not unusual. Thus, one reason multiple-model firms have survived is the flexibility that they have over the single-model car producers; larger firms can more readily deal with shifts in public taste.

More than technology is required to make a successful automobile producer: clearly, liquidity and management skills are significant. Intense competition from Japan in the 1980s led to a vast reduction in the size of the automobile industry in the United States. All three of the major domestic producers closed plants, consolidated functions, and laid off tens of thousands of blue-collar and white-collar workers.

In Congress, demands for a high tariff on Japanese cars or a tough quota system led the federal government to negotiate a voluntary reduction in exports from Japanese automakers. At the same time, domestic firms began to purchase complete cars, motors, and parts from Japanese companies and entered into joint-production agreements with them. The Japanese builders then entered the domestic market by acquiring or building new plants in California, Tennessee, and Kentucky. Ironically, the first foreign car builder to produce automobiles in the United States, Volkswagen, was forced to close its plant in 1988 because of deteriorating sales.

General Motors, Ford, and Chrysler, protected by the threat of reprisals against Japanese imports, and with far more efficient facilities and higher-quality products, returned to profitability by the end of the decade. Indeed, profit levels at Ford reached unprecedented levels. Despite the ever-increasing costs of operating automobiles and constantly escalating purchase prices of new cars, the love affair of the American people with the automobile has not ended.

It may be that the 1990s, will present a period of estrangement, but certainly the society requires widespread car ownership. Not even the introduction of an efficient mass transit system can cope with the hundreds of thousands, indeed millions, of Americans who live fifteen, twenty, or more miles from the places where they work and the stores where they shop. The 80 million cars on American roads will continue to need service and replacement through the next decade, and American automobile manufacturers continue to develop more efficient models and engines to meet the altered energy-source requirements.

The American "love affair" with the car produced federal and state programs to construct highways and streets for the auto. Federal legislation in 1916 began the program, which accelerated after 1945. In addition, the modernization and expansion of highways provided additional arteries for the trucking industry. While the railroads maintained their dominance in ton-miles of freight carried, the trucking industry surpassed the railroads in total tonnage in the postwar years. Seventy-five percent of the freight trans- ported in the United States moved in trucks by the 1970s. The trucking lobby played an important role in securing passage of the Interstate High- way Act. Thereby, the vast expansion of long-distance movement of freight by trucks.

THE TRUCKING INDUSTRY AND INTERCITY BUSES

New York City department stores began to use steam-powered delivery trucks in 1901, and by 1906, the United States Postal Service was delivering mail with steam trucks built by the White Motor Company. The employment of trucks in cities expanded rapidly as did the size of the units. Mack trucks with a capacity of tons became available in 1911, and mass- produced trucks of 1 tons or 2 tons became commonplace. Trail mobile introduced the first four-wheel trailer designed to be pulled by a Model Ford in 1915.

The coming of World War I led to the production of tens of thousands of trucks and trailers for military purposes, and truck convoys from Detroit to Baltimore in 1917 proved that long-distance truck transportation could be feasible economically in the United States. Trailer production soared in the 1920s and by the end of the decade, the Mack Truck Company produced high-speed, 6-cylinder truck engines for tractors with a capacity to pull 8 tons.

Trucks provided a flexible, low-cost means of moving goods and could serve areas lacking rail transportation. Thus, the trucking industry helped to end rural isolation and provided door-to-door service for less-than-carload-lot shipments (LCL). The 3 million trucks of 1929 provided almost 4 percent of the total intercity freight ton mileage. Throughout the 1930s, truck traffic grew, and by the time of World War II, trucks carried one-sixth as much freight as the railroads. Military needs during the war stimulated the production of heavy-duty trucks and trailers, and transportation demands after 1945 hastened the expansion of truck systems—and of intercity bus systems.

The intercity bus replaced the interurban railways that had been constructed prior to World War I and in the early 1920s. Buses proved far more flexible in terms of routes and less expensive to operate. The bus companies initially operated short, nonintegrated segments from major cities to smaller, nearby localities. The improved highway system of the 1920s, and the construction of larger buses, made it possible for routes to be extended. Hundreds of competing small bus companies were consolidated, and in 1929, the Greyhound System emerged.

The bus industry grew with the coming of the depression of the 1930s and expanded its services dramatically during World War II to meet heightened transportation needs. Mileage of highway bus routes tripled that of railroad passenger service by the 1960s and communities that had never had rail passenger service often had at least once-a-day bus service. Although the bus systems had already largely supplemented rail passenger service, later in the 1960s, when the tremendous reduction of railway passenger trains took place, bus traffic expanded and filled the void.

The intercity bus systems of the 1970s replaced the railroad as a provider of economical transportation. Ironically, by the 1980s reduced airfares hit the intercity bus lines hard, and in 1988 the nation's two largest systems, Greyhound and Trailways, were merged in order to survive. The airlines, however, produced the most startling changes in post—World War II passenger and mail service.

THE AIRLINES

Commercial aviation in the United States did not "take wings and fly." Instead, the evolution of the industry proved long, painful, and costly. From the barnstormers of the post—World War I era to the jumbo jets, the financial risks taken by the airline companies and their investors have been massive, and losses have been significant. The absence of a consistent long- range federal policy for commercial aviation and the enormous capital requirements of the companies have taken a heavy toll. However, without substantial governmental expenditures for airports and navigational systems, and military purchases of civilian aircraft, the industry might have remained the toy of the rich and the adventuresome. When World War I ended, the government and the infant aircraft companies flooded the market with surplus planes. Young veterans of the skies of France returned home to inaugurate mail runs between the nation's major cities, and transcontinental mail service opened on September 8, 1920.

By the mid-1920s night flights expanded operations, but the fledgling industry was still dangerous: Thirty-one of the first forty pilots hired by the Post Office Department lost their lives. Federal airmail operations ended in 1925 when the Air Mail Act transferred the service to private operators. The government had decided to contract with commercial carriers and take the Post Office out of the aviation business. Contracts for mail service provided the basis upon which the early airlines emerged. For example, airmail routes One and Two, Boston—New York and Chicago—St. Louis, later became portions of American Airlines; routes Five and Eight in the West became basic units of United Airlines. Initially, however, each short segment had a single operator; there were no "systems."

Many of the carriers raised capital from automobile dealers and manufacturers, and Henry Ford owned the Detroit-Chicago-Cleveland franchise, which flew his own Ford tri-motored aircraft. The exploits of Charles Lindbergh in the 1920s made aviation history, but more importantly, they gave the industry publicity and generated more investment interest. In Seattle, young lumberman Bill Boeing acquired an airmail contract from Chicago to San Francisco. In a few months, he had designed and built twenty-five large biplanes (B-40) to operate the route. A holding company, United Aircraft and Transport, soon included Boeing's aircraft plants and airmail line, engine maker Pratt and Whitney, and Hamilton's Propeller Company. The parent corporation, the brainchild of New York's National City Bank, also acquired Sikorsky Airplane Company, leading builder of flying boats. Other aviation conglomerates would soon follow the pattern established.

The industry entered a transition period in the late 1920s. As larger, enclosed aircraft became available, passenger traffic began to grow. Fares for air travel were very expensive, and few Americans could afford to fly. Without mail contracts as a form of subsidy, passenger service would have been virtually impossible because of the high costs of operating these new planes. Only 33,000 passengers traveled by air in 1930, and expansion of service was possible only with additional mail revenues. The profit potential in air commerce attracted investments from bankers, automobile dealers and manufacturers, and even railroad leaders. It also led to intense competition for mail contracts and, as a result, federal intervention. Forty-four carriers bidding against each other could not meet the needs for a large-scale, coordinated service.

The Air Mail Act of 1930 sought to build systems to replace the small, undercapitalized carriers. Contracts to the largest firms forced a series of mergers, with General Motors a large security holder of one of the winners, Transcontinental and Western Air. Competitors cried foul, and the rush to gain advantage created chaos in aviation stocks even as the Great Depression began. An investigation of the awarding of airmail contracts by Senator Hugo Black led to revelations of favoritism, if not fraud.

In 1934, in a gross overreaction, the federal government resumed airmail operations with President Franklin Roosevelt ordering the Army Air Service to carry the mail. Within a week, the service lost eighteen pilots: twelve dead and six injured. With poor planes, little experience, and seriously understaffed, the service struggled on, but the results were tragic. Costs of operation rose from 54tf a mile by the airlines to $2.21 under federal operation.

The Air Mail Act of 1934 separated the aircraft manufacturers from the airlines and returned airmail service to private operators. Under the New Deal, commercial aviation began anew. The Civil Aeronautics Act of 1938 established permanent routes for passenger service and provided generous subsidies for mail service. In effect, the government guaranteed a profitable return on the industry's investment. The technical advances provided by the new DC-3s from Douglas Aircraft and the Boeing 247 spurred further expansion of air service.

The nation's cities often spent Works Progress Administration funds for runways and terminal buildings to handle enlarged passenger operations. The rise of the airline industry in the United States was paralleled in Western Europe. Competition for markets in Latin America, Asia, Africa, and the Pacific reached a feverish pitch. The Dutch and French established lines to Africa and the Middle East by the mid-1920s, and Imperial Airways of Britain extended service to India. German companies established air- lines in South America that by the 1930s represented a threat to the security of the United States, and particularly to the Panama Canal. To block the Germans, the United States government gave strong support to Juan T. Trippe and Pan American Airways. Trippe built Pan American with a combination of foresight, diplomatic skill, and commitment to operating the best aircraft over the most economical routes.

Throughout the 1920s, Trippe invested in several air- lines, none of which achieved success. In 1927, a mail contract to Cuba became the first leg of a soon-to-be awesome route system for Pan American. Trippe acquired multiengine planes and pioneered in the use of Sikorsky flying boats. He dispatched engineers to find the best landing sites, and Pan American devised new radio navigation systems for long- distance flights. The Department of the Navy encouraged the awarding of mail subsidies to Trippe, which furthered his expansion efforts in the Caribbean and Latin America. With additional support from the federal government, Trippe moved to expand Pan American service to Europe via the Azores, and across the Pacific to China. Constantly in search of larger aircraft capable of longer flights, Pan Am turned to Sikorsky, which designed the huge Clipper flying boats for the burgeoning international carrier. Trippe dispatched Charles Lindbergh to the Arctic and around the Pacific to find the most feasible routes, but the State Department insisted on a mid-Pacific flight, island- hopping from one United States possession to another. Using the Martin-built China Clippers, Pan American began operations from San Francisco to Hong Kong.

The new Boeing Clippers allowed Pan American to fly from the United States directly to England in 1938. Trippe took advantage of the diplomatic requirements of the United States and the subsidies it brought to build his company. Pan Am, in turn, spurred the domestic aviation industry to higher levels of technological achievement.18 The coming of World War II halted the development of commercial aviation as the airlines lost planes, pilots, and crews to the war effort. However, with the conflict over in 1945 the companies stood ready for rapid expansion in the domestic and international markets.

The Douglas DC-3 had stimulated the industry prior to the war, and now hundreds of the military version of the plane were available at low surplus prices. In addition, larger four-motored DC-4s and Lockheed Constellations were available for longer flights. Every carrier wanted to acquire new routes and enter new markets, and the Civil Aeronautics Board (CAB) stood in a maelstrom of conflicting demands, intensified competition, and political pressures. In the three decades after 1945, the Board tried to strengthen the carriers, maintain com- petition, and expand services. It largely failed. Several major carriers— Capital and Northeast—had to be rescued by mergers before bankruptcy ended their existence. Some of the companies came near extinction because of unprofitable route awards and heavy purchases of aircraft at times of declining traffic. The federal, state, and municipal governments invested billions of dollars in runways, terminals, navigational systems, and safety programs that directly benefited the carriers in addition to massive federal subsidies through mail contracts.

By 1963, the local service subsidy alone ran over $85 million yearly. Yet the costs of operation and particularly the purchase of jet aircraft, made aviation a most unstable investment prospect. Following the end of the war, numerous new regional carriers emerged to operate between small cities and even smaller towns. Other lines, the nonscheduled, carried freight and chartered passenger service. The intensive competition of the late 1940s led to the introduction of coach fares and further encouraged the airlines to seek larger aircraft to spread costs over greater seating capacity. The CAB tried to balance route awards, but political interference precluded the most prudent assignments and heightened the marginal economic situation of some carriers.

The coming of the jet age heavily taxed the ability of the airlines to find needed capital. In 1952, the British began operating the jet-powered Comets, which immediately raised competitive levels on international flights. A series of tragic crashes caused by metal fatigue drove the Comets from the air and retarded the development of the jet airplane for commercial aviation. Nevertheless, the jet age had begun. Boeing built its prototype of the 707, but for some time, the carriers stayed away fearing the consequences of the purchase price and operating costs. Juan Trippe broke the resistance with orders for twenty of the 707s and twenty-five Douglas DC-8s, which Pan Am put in service in 1958. Other carriers quickly placed orders, and the manufacturers soon could not meet demands. The aviation manufacturers that did not respond to the jet age immediately—Convair and Lockheed— were virtually driven from the commercial-plane market.

JUAN T. TRIPPEAND THE BOEING 747

Between December 1965 and January 1970 Pan American World Airways and the Boeing Company risked over $2 billion on the development of a revolutionary aircraft, the Boeing 747. Juan T. Trippe of Pan Am and President William M. Allen of Boeing had known each other for decades, and both were pioneers in aviation. The famous Clippers produced by Boeing in the 1930s played a significant role in establishing Pan Am as the nation's major international carrier.

Now Trippe wanted a huge airplane with both passenger and freight capacity to handle traffic-growth projections for the next two decades. The plane had to be quiet, efficient, fly at altitudes greater than 33,000 feet, and have a range of at least 4,400 miles. Pan Am wanted an aircraft that would give it dominance in international traffic, and Boeing wanted to enter a new market ahead of Douglas Aircraft and Lockheed, its two major competitors.

Boeing agreed to develop the plane, but Pan Am had to invest $500 million in pre-delivery payments for the first twenty-five aircraft. The advance would be paid even before the Federal Aeronautics Administration tested the plane. Just over four years passed between the contract signing and the first flight. During that time both corporations came close to withdrawing from the project. Boeing engineers could not meet some of Trippe's demands on schedule, and the airline wanted positive answers as it made the huge advance payments.

The design went through many modifications: The engine manufacturer, Pratt-Whitney, had to develop two new series of motors; and the wide- body concept had to be sold to other carriers if Boeing's investment was to prove profitable. The great gamble paid off for Boeing and Pan Am. The manufacturer sold hundreds of planes, and Pan Am gained a more efficient aircraft and an advantage, albeit temporary, in the competition for international travelers.

Both corporations profited from their willingness to risk over $2 billion in private capital. Trippe's requirements created a new era in air travel and helped produce a significant reduction in fares on longer routes, particularly the transatlantic run. The four major domestic airlines—United, American, Eastern, and TWA—came to dominate four-fifths of the market by the early 1960s. United and American received high marks from investors for their sound expansion and stable management. Eastern, however, under flying pioneer Eddie Rickenbacker, almost failed because of a declining reputation for service. TWA suffered from control by Howard Hughes and the huge orders for airplanes it could not use, which Hughes Tool Company had to finance.

United acquired Capital Airlines in 1961 to become the largest domestic carrier, replacing American Airlines. C. R. Smith, president of American, who had determined that international operations would not be as profitable as domestic ones for his company, concentrated very success- fully on the latter market. However, by the 1970s, the major carriers were strongly challenged by several of the larger regional lines. Delta in the South, Braniff in the Southwest, Northwest Orient in the Northwest, Continental in the West, and National in the Southeast slowly gained additional routes during the decades of the 1960s and 1970s.

The CAB allowed a constant expansion of markets for these lines, and with sound managements, which emerged simultaneously; they became competitive with the four largest airlines. The CAB expansionist policy gave travelers greater choices and often-lowered fares, but it also imperiled some of the carriers financially; in 1982 Braniff, declared bankruptcy because of overexpansion, and it emerged as a much smaller company. Continental expanded across the nation, overextending the carrier. It entered bankruptcy to break union contracts and became a low-cost, high volume airline. Its parent, Texas Air, absorbed other carriers and gained control of East- ern to become the nation's largest airline, but one that lost money every year because of the deeply discounted fares.

The airlines replaced the railroads as the major transporters of long-distance passengers and mail, yet the industry lacked economic stability. Intensified competition, conflicting CAB policies, and a fare system of nightmare like confusion brought cries for deregulation of the industry. In 1978, the federal government embarked on a new policy to allow the market- place to establish fares and rationalize the route structures. Many of the smaller regional carriers moved into markets abandoned by the majors, and commuter air services sprang up to fill voids in the system.

Federal agencies, mainly the Federal Aeronautics Administration, continued to provide major subsidies in the form of safety and navigational services while city and county governments built larger and more architecturally impressive terminals and longer runways with federal funds. Yet the industry remained turbulent, without a consistent national policy to provide direction. The annual cost of travel and freight, both commercial and private, represents approximately 20 percent of the GNP. The United States is unique as the only industrialized country in the world lacking a national transportation plan, which has contributed to both confusion and opportunities in the marketplace.

NOTES 1. S.F. Van Oss, American Railroads As Investments (New York: Putnam's, 1893), p. 235. 2. Richard Saunders, The Railroad Mergers and the Coming of Conrail (Westport, Connec- ticut: Greenwood Press, 1978); this is an outstanding study of the merger movement. 3. James J. Flink, The Car Culture (Cambridge: MIT Press, 1975), p. 140. 4. James J. Flink, America Adopts the Automobile, 1895-1910 (Cambridge: MIT Press, 1970), pp. 1-3, 39. 5. Ibid., pp. 294-296. 6. Ibid., pp. 40-41. 7. Ibid., pp. 52-53, 57, 59; John B. Rae, The Road and the Car in American Life (Cam- bridge: MIT Press, 1971), p. 57. 8. John B. Rae, American Automobile Manufacturers: The First Forty Years (Philadelphia: Chilton, 1959), pp. 86-87. 9. Alfred D. Chandler, Jr., Strategy and Structure: Chapters in the History of American Industrial Enterprise (Cambridge: MIT Press, 1962), pp. 116, 297-298; Flink, The Car Culture, pp. 62-66. 10. Chandler, Strategy and Structure, pp. 114-115, 117-126, 143, 152, 158. 11. Robert Paul Thomas, "The Automobile Industry and Its Tycoon," Explorations in Entrepreneurial History, 2nd series, vol. 6 (Winter 1969), p. 141. 12. Rae, American Automobile Manufacturers, p. 2. 13. Sidney Fine, The Automobile under the Blue Eagle (Ann Arbor: University of Michigan Press, 1963); this is the definitive study. 14. Lawrence J. White, The Automobile Industry since 1945 (Cambridge: Harvard Univer- sity Press, 1971). 15. Ibid., pp. 44-53. 16. Mark H. Rose, Interstate: Express Highway Politics, 1941—1956 (Lawrence: Regents Press of Kansas, 1979). 17. Charles J. Kelly, Jr., The Sky's the Limit: The History of the Airlines (New York: Coward-McCann, 1963), pp. 15—69. 18. Robert Daley, An American Saga: Juan Trippe and His Pan American Empire (New York: Random House, 1980); see also Wesley Phillips Newton, The Perilous Sky: U.S. Aviation Diplomacy and Latin America, 1911—1931 (Coral Gables, Florida: University of Miami Press, 1978). 19. Kelly, The Sky's the Limit, pp. 199-283. SUGGESTED READINGS Daley, Robert. An American Saga: Juan Trippe and His Pan American Empire. New York: Random House, 1980. Flink, James J. America Adopts the Automobile, 1895-1910. Cambridge: MIT Press, 1970. Hofsommer, Don L. The Southern Pacific, 1901—1985. College Station: Texas A&M University Press, 1986. Jardim, Anne. The First Henry Ford: A Study in Personality and Business Leadership. Cambridge: MIT Press, 1970. Kelly, Charles J., Jr. The Sky's the Limit: The History of the Airlines. New York: Coward- McCann, 1963.

150 Transportation and the Marketplace Kuter, Laurence S. The Great Gamble: The Boeing 747. University: University of Alabama Press, 1973. Lewis, W. David, and Wesley Phillips Newton. Delta: The History of an Airline. Athens: University of Georgia Press, 1978. Nevins, Allan. Ford: The Times, the Man, the Company. New York: Charles Scribner's Sons, 1954. . Ford: Expansion and Challenge, 1915-1933. New York: Charles Scribner's Sons, 1958. , and Frank Ernest Hill. Ford: Decline and Rebirth, 1933-1962. New York: Charles Scribner's Sons, 1963. Newton, Wesley Phillips. The Perilous Sky: U.S. Aviation Diplomacy and Latin America, 1919— 1931. Coral Gables, Florida: University of Miami Press, 1978. Rae.John B. The Road and the Car in American Life. Cambridge: MIT Press, 1971. . American Automobile Manufacturers: The First Forty Years. Philadelphia: Chilton, 1959. . The American Automobile: A Brief History. Chicago: University of Chicago Press, 1965. Rose, Mark H. Interstate: Express Highway Politics, 1941—1956. Lawrence: Regents Press of Kansas, 1979. Saunders, Richard. The Railroad Mergers and the Coming of Conrail. Westport, Connecticut: Greenwood Press, 1978. Stover, John F. The Life and Decline of the American Railroad. New York: Oxford University Press, 1970. White, Lawrence J. The Automobile Industry since 1945. Cambridge: Harvard University Press, 1971. 150 Transportation and the Marketplace Kuter, Laurence S. The Great Gamble: The Boeing 747. University: University of Alabama Press, 1973. Lewis, W. David, and Wesley Phillips Newton. Delta: The History of an Airline. Athens: University of Georgia Press, 1978. Nevins, Allan. Ford: The Times, the Man, the Company. New York: Charles Scribner's Sons, 1954. . Ford: Expansion and Challenge, 1915-1933. New York: Charles Scribner's Sons, 1958. , and Frank Ernest Hill. Ford: Decline and Rebirth, 1933-1962. New York: Charles Scribner's Sons, 1963. Newton, Wesley Phillips. The Perilous Sky: U.S. Aviation Diplomacy and Latin America, 1919— 1931. Coral Gables, Florida: University of Miami Press, 1978. Rae.John B. The Road and the Car in American Life. Cambridge: MIT Press, 1971. . American Automobile Manufacturers: The First Forty Years. Philadelphia: Chilton, 1959. . The American Automobile: A Brief History. Chicago: University of Chicago Press, 1965. Rose, Mark H. Interstate: Express Highway Politics, 1941—1956. Lawrence: Regents Press of Kansas, 1979. Saunders, Richard. The Railroad Mergers and the Coming of Conrail. Westport, Connecticut: Greenwood Press, 1978. Stover, John F. The Life and Decline of the American Railroad. New York: Oxford University Press, 1970. White, Lawrence J. The Automobile Industry since 1945. Cambridge: Harvard University Press, 1971.