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Paper 07-003-01A: Evolution of the Federal Role in Transportation
**Paper 07-003-01B: Current Mechanisms through which the Federal
Interest in Transportation is Exerted**

SUPPLEMENTARY MATERIALS

Paper 07-003-01: Evolution of the Federal Role in Transportation & Current Mechanisms through which the Federal Interest in Transportation is Exerted

SUPPLEMENTARY MATERIALS

Table of Contents

1. Bibliography
2. Relevant Issues Precluded by Paper Format
 - a. Features of Selected Federal-Aid Highway and Related Acts
 - b. Sources of Federal Highway and Transit Funds
 - c. State and Local Government Roles (expanded)
 - d. USDOT and Other Federal Agencies with Role in Transportation
 - e. National Economic Benefits of Transit Service
3. Original Sources
 - a. Blaszak, Michael W., "Railroad Reregulation, The Struggle for Prosperity"
 - b. Congressional Budget Office, "New Directions for the Nation's Public Works"
 - c. DiLorenzo, Thomas J., "The Role of Private Transportation in America's 19th-Century 'Internal Improvements' Debate"
 - d. Edner, Sheldon, Ph.D., and Bruce D. McDowell, Ph.D., "Surface-Transportation Funding in a New Century: Assessing One Slice of the Federal Marble Cake"
 - e. Fischer, John W., "Past as Prologue?: A Brief Legislative History of the Modern Federal Aid Highway Program"
 - f. Hecker, JayEtta Z., "Challenges and Strategies for Enhancing Mobility"
 - g. Klein, Daniel B. and John Majewski, "Economy, Community, and Law: The Turnpike Movement in New York, 1797-1845"
 - h. Lockwood, Steve and Damian Kulash, "The Federal Role in Surface Transportation"
 - i. Luberoff, David, "The Triumph of Pork over Purpose"
 - j. Schweppe, Ellen, "Legacy of a Landmark: ISTEA After 10 Years"
 - k. U.S. Government Accountability Office, "Intermodal Transportation, Challenges to and Potential Strategies for Developing Improved Intermodal Capabilities"
 - l. Wallis, John Joseph, "American Government and the Promotion of Economic Development in the National Era, 1790 to 1860"
 - m. Weingroff, Richard F., "Federal-Aid Highway Act of 1956: Creating the Interstate System"

- n. Weingroff, Richard F., "Essential to the National Interest"
- o. Weingroff, Richard F., "June 29, 1956 A Day in History"
- p. Weingroff, Richard F., "Moving the Goods: As the Interstate Era Begins"
- q. Weingroff, Richard F., "Original Intent: Purpose of the Interstate System 1954-1956"
- r. Weingroff, Richard F., "The Year of the Interstate"

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Features of Selected Federal Aid Highway, Surface Transportation and Related Acts

- The Post Office Appropriations Act for 1923 provided for "contract authority" – still a key element in the federal-aid program -- enabling state highway agencies to advance multiyear federal-aid projects with obligating the full sum before annual appropriations were approved.
- With the Depression, road-building became an important means of providing relief work. The Federal Highway Act of 1938 called for investigation of a system of transcontinental super highways, from north to south and east to west. Transcontinental super highways were supported by President Franklin Roosevelt, to be paid for out of disposal of land acquired on either side of the highway that would be sold after it appreciated in value as a result of the new access, gasoline or other concessions along the highway, or bond revenues to be paid off by toll charges for use of the highway.
- **Federal-Aid Highway Act of 1956.** The *Federal-Aid Highway Act of 1944* had authorized designation of a 40,000-mile "National System of Interstate Highways," but did not establish a program or special funding for its construction. The first such funding came under the *Federal-Aid Highway Act of 1952*, which authorized a token amount of \$25 million a year for the Interstate System in Fiscal Years (FY) 1954 and 1955. The *1952 Act* retained the then standard matching ratio (Federal share: 50 percent). In his 1956 Annual Message on the Economic Report, President Dwight Eisenhower stated that, "The country urgently needs a modernized interstate highway system to relieve existing congestion, to provide for the expected growth of motor vehicle traffic, to strengthen the Nation's defenses, to reduce the toll of human life exacted each year in highway accidents, and to promote economic development."¹

Two years earlier, President Eisenhower had asked the nation's governors to help him develop the plan for the system. The President's "grand plan" extended well-beyond the interstate system to include a contribution from each level of government – federal, state, county and municipal – toward upgrading the country's entire road network over a 10-year period. The Governors responded with a plan and cost-sharing proposal: given the federal interest in the Interstate System, the federal government would assume primary responsibility, with State participation, for financing its construction. [The total cost of the Governors' plan was then estimated to be \$101 billion (urban \$37 billion, rural \$64 billion), with the federal share to be 30 percent of the total.²] The *Federal-Aid Highway Act of 1954* authorized \$175 million a year for the Interstate System (FYs 1956 and 1957), with a Federal-State matching ratio of 60-40. By 1956 the Governors were concerned that they might need to increase state taxes to provide the local match for federal funds. Thus, when the

¹ The concept of such interstate highways was advocated by Senator William Randolph Hearst in 1906 and the National Highway Association's interstate system with map proposal of 1913, augmented by the difficulties of transporting military equipment and vehicles to port during World War I, and immediately preceded by the transcontinental super highway direction of the Federal Aid Highway Act of 1938.

² Weingroff, Richard F., "Original Intent: Purpose of the Interstate System 1954-1956," <http://www.fhwa.dot.gov/infrastructure/originalintent.cfm>

program finally was embodied in the Federal-Aid Highway Act of 1956, it increased the Federal share of the federal-state matching fund program to 90 percent for the Interstate System as a reflection of the program's importance to national goals. (In the western States with large amounts of untaxed public land, the Federal share could be increased to 95 percent.) A tax package to finance the plan eventually was agreed upon: revenue from highway user taxes, including a gas tax increase, credited to the new Highway Trust Fund.

- In terms of planning, the most important provision of the Federal-Aid Highway Act of 1962 was that transportation projects in urbanized areas of 50,000 or more in population be based on an urban transportation planning process.
- The Federal Aid Highway Act of 1973
 - increased the federal share for transit capital grants for urbanized areas
 - allowed highway funds to be used for transit capital purchases
 - created a rural public transportation demonstration program that resulted in the start-up of several rural transit programs
 - allowed an uncompleted or planned highway on the Interstate System in an urbanized area to be withdrawn and its funding transferred to a substitute mass transit project to serve the same area (known as Interstate Transfer)
- The 1974 National Mass Transportation Assistance Act created a formula grant program for purchase of transit equipment or facilities or to assist in financing transit operations; it also established capital grants for specialized transit services for elderly and handicapped persons.
- The Surface Transportation Act of 1978 established a formula program to support state planning and capital and operating needs of transit programs in small towns and rural areas.
- In the 1981 Federal-Aid Highway Act emphasis shifted to early completion and preservation (resurfacing, restoration, rehabilitation) of the Interstate system, and the Surface Transportation Assistance Act (STAA) of 1982 also focused on the problem of deteriorating infrastructure.
- The 1982 STAA created a new formula grant program for expenditures on planning, capital and operating items, with substantial discretion given to state and local governments in selecting projects to be funded using formula grants. The one cent increase in the user per gallon charge on fuels could only be used for capital projects (discretionary), and the definition of capital was changed to include associated capital maintenance items.
- The Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA), passed over President Ronald Reagan's veto, provided for completion of all remaining segments of the Interstate system, updated the rules for compensating those displaced by federal development, raised the speed limit on Interstate routes outside urbanized areas, and removed previous restrictions on the tolling of federal aid routes. With STURAA the Congressional practice of earmarking funds for specific projects took a dramatic leap forward; \$1.78 billion was provided to fund 152 specific projects outside of the regular federal-aid highway program.

STURAA also established grant criteria for new fixed guideway projects modeled on those that UMTA had been using (projects had to be based on alternatives analysis and cost effective and supported by an acceptable degree of local financial commitment)

- **ISTEA.** After 75 years of highway and transit funding packages, ISTEA substantially reconsidered federal transportation practices and developed a post-interstate framework for federal surface transportation programs including many new ideas and ways of doing business. ISTEA attempted to create an intermodal framework for transportation policy, provided for a significant increase in state/regional control over the transferability of funds among programs and strengthened the state and local role in transportation planning, a significant departure from the federal/state funding process on the highway side, for example, wherein states could spend funds within funding categories according to federal highway facility classifications: Interstate, Federal-aid Primary, Federal-aid Secondary and Federal-aid Urban. ISTEA reduced the federal highway classifications to just two: the Interstate Highway System and the National Highway System (which includes the IHS) consisting of the 4 percent of the nation's roads considered vital to the nation's economy, defense and mobility. At the same time, states and regions, some provided with direct federal funding for the first time, were given the flexibility to spend federal funds for a variety of locally-chosen methods to address more recent federal interest goals, such as mitigating traffic condition and attaining Air Quality standards, and local needs through a broad range of eligible projects. In addition, ISTEA emphasized new technology (ITS) and innovative financing mechanisms to address transportation problems and provided for a demonstration of pricing to manage congestion.
- **TEA-21.** TEA-21 maintained the basic framework of ISTEA, and added new programs to address issues of Border Infrastructure, Transportation Infrastructure Finance and Innovation, and Access to Jobs. It also expanded upon the mandated "minimum guarantee" return to the states of a percentage of federal vehicle fuel revenues. The subsequent, current multi-year surface transportation authorization, Safe Accountable, Flexible and Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU) further increased the mandated percentage return.

TEA-21 for the first time guaranteed multi-year funding levels for public transit. It also eliminated operating subsidies for transit systems serving communities over 200,000 population.

Sources of federal highway and transit funds. From 1916 to 1956, federal financial assistance for the highway program came from the General Fund. Federal motor fuel and motor vehicle taxes were directed to the General Fund, but there was no direct relationship between the revenues from those sources and federal highway expenditures. The Highway Revenue Act of 1956 created the Highway Trust Fund to ensure a dependable source of financing, primarily but not only for the Interstate Highway System. The Act authorized that revenues from certain highway-user taxes (originally 4 cents per gallon of motor fuel) could be credited to the Highway Trust Fund to finance the expanded highway program of the Federal-Aid Highway Act of 1956; authorization and uses of the fund have since been extended. Tax revenues directed to the Trust Fund are derived from excise taxes on highway motor fuel and truck-related taxes on truck tires, sales of trucks and trailers, and heavy vehicle use. The 1982 Surface Transportation Act raised the highway user charges by an additional five cents a gallon (four cents of which was for highway programs), substantially increased and changed the nature of truck user fees (from a fixed rate to a graduated rate by weight).

Of the revenues raised from the five cent increase in user fees in the 1982 Surface Transportation Act, one cent was for transit programs, the latter of which was placed in a Mass Transit Account of the Highway Trust Fund. Federal support for transit includes both the revenue from fuel taxes (since 1997 now 2.86 cents per gallon) from the Mass Transit Account of the Highway Trust Fund and general fund appropriations. [The Leaking Underground Storage Tank Trust Fund receives usually 0.1 cent per gallon; the General Fund receives 2.5 cents per gallon of the tax on gasohol and some other alcohol fuels plus an additional 0.6 cent per gallon for fuels that are at least 10 percent ethanol.]

State and local government roles

The initial response of states to addressing transportation problems and needs generally was through regulation. Other state/local government roles in transportation are described below:

Highways: Infrastructure Development and Funding

Historically. Counties and towns became the first level of government to address the needs of agriculture to get products to market, the phenomenon of personal automobile ownership and use, and the resulting demand for better roads. Tax and bond funds provided towns and counties with the monies for improvements. Most roads were unpaved. Although some states were active in building and owning bridges, that activity diminished during the canal and railroad era. State government began to be involved initially in planning state road systems comprised of existing roads, and then in funding improvements to those roads. (Through the 1916 Federal Aid Road Act, the federal government created the incentive for states that had not already done so to establish state highway departments.) When highway work had grown to be more than the counties could handle, the state legislature might authorize a construction bond and charge the new state agency with taking over the state highway system for maintenance and improvement and getting the state (or “the farmer”) “out of the mud.” With growing needs, additional sources of funds were created for road construction and maintenance, such as dedicated motor vehicle license fees, operators' license fees, fines for violation of driving regulations, and a gasoline tax. Most highway construction consisted of improvements to existing routes.

Now. The series of 20th century Federal-Aid Highway Acts and the multi-year surface transportation funding authorizations that followed changed all that, and states became and continue to be partners with the federal government in the development of highways. (The funding mechanisms through which the federal government partners with the states in highway development and operations are described in Section 4 of this paper, and in greater detail in Appendix A of paper 5C-02 Characteristics of the Federal-aid Surface Transportation Program.)

Railroads: Concessions, Financing, Safety Enforcement

Historically. Both cities and states actively promoted the development of railroads through the granting of exclusive charters, as well as direct aid, to advance their economic competitiveness.

Now. More recently, in partnership with the federal government, many states have assumed responsibility for enforcement of railroad safety regulations.

Transit: Concessions, Ownership, Financing, Operation, Infrastructure Development

Historically. As the states had done with the railroads, cities encouraged the development of urban transit systems through concession agreements. Local government ownership and operation of public transit began in the early 20th century. San Francisco's Municipal Railway was created in the 1920s; in 1940, New York City unified its three

privately-owned and operated subway lines under public ownership. Post-World War II, nearly all of the remaining privately-owned and operated mass transportation companies were failing, and came to be acquired by local government or newly-created regional transit authorities. In more recent years, commuter railroads also were converted from private to local/regional public ownership and operation (several passing through quasi-federal Conrail ownership/operation along the way, between 1976-1981).

Now. Currently, many local government and regional transit authorities work in partnership with the federal government to develop new transit infrastructure and provide transit services. As transit plays a more important role in regional job access and congestion mitigation and in shaping development, the formation of regional transit authorities and transit organizations continues to grow. Today, 556 local public transit operators provide transit services in 408 urbanized areas of over 50,000 population. An additional 1,215 organizations provide transit services in nonurbanized (rural) areas, and 3,673 organizations provide specialized services to the elderly and to people with disabilities. Some public transit authorities contract out transit services on specific routes or systemwide, as well as other management, operations and maintenance services, to private sector companies.

Intermodal Facilities: Planning, Financing and Infrastructure Development

Historically. Generally concurrent with or following creation of USDOT, state highway departments became state departments of transportation, and some state DOTs, even with limited influence on non-highway modes, are growing effectively into intermodal/multimodal organizations (although continued federal mode-specific “stovepipe” funding is frequently reflected in the organization of state DOTs).

Now. In response to federal planning requirements coming out of the Intermodal Surface Transportation Efficiency Act (ISTEA), many states have included intermodal facilities in their planning and capital programs and are engaged in developing intermodal facilities projects.

Private sector roles

Highways: Infrastructure Development and Operations

Historically. As early as 1800, there were 69 private road-building companies, chartered by the states, and privately-funded roads (called “turnpikes”) continued to proliferate during the first decades of the nineteenth century [Klein]. Between 1810 and 1845 over 400 private turnpikes were chartered and built.

Now. Today, there is renewed interest in private sector development and/or operation of highways. The 1991 ISTEA bill provided for combining federal aid with private financing and more flexible operating arrangements. Another provision of ISTEA expanded opportunities for toll roads and permitted private ownership of facilities constructed with Federal-aid financing. Through a variety of public-private partnerships, the private sector has been engaged in both the financing of and innovative delivery mechanisms for new transportation infrastructure.

Railroads: Infrastructure Development and Operations

Historically. The private sector largely built, owned and continues to operate the freight rail system, and until the mid-20th century largely built, owned and operated intercity passenger rail. In the early decades of the country, there was active public debate about the use of federal government subsidies to advance privately-built and owned transportation, primarily road and canal, infrastructure, with Thomas Jefferson, James Madison, James Monroe, and Andrew Jackson taking the position that government subsidies were unconstitutional. Still, the private sector was supported to some degree by the federal government in the construction of railroads (and, as described above, on the state and local level government subsidies for railroads were prevalent). (See Section 6. Federal Roles and Mechanisms in Freight Rail.)

After the railroads were largely built, the primary interface between the private sector and the federal government was through regulation, starting in 1887 (and supported by the railroad industry). Since 1939 the number of Class I (annual operating revenues above \$277.7 million in 2004 dollars) railroads has been reduced from 132 to 7 as the result of mergers and bankruptcies, and significant reduction in federal regulation starting in 1980. The development of the Interstate Highway System and of commercial aviation in the 1950s and 1960s brought rail transportation, both freight and passenger, to its lowest point in 135 years.

Now. In recent years, the remaining freight railroads are booming, aided in part from the reduction in regulations that had required maintenance of passenger and local freight service, and buoyed in part by growth in international trade that creates a demand for transcontinental rail distribution -- and, conversely, the transportation of US products to ports. In 2005, US railroads carried 1.5 trillion ton-miles of freight, more than three times the ton-miles of cargo carried annually in 1930. The demand has created the need for significant rail infrastructure capacity increases, including double and triple-tracking in some places where trackage had earlier been reduced, double-stacking of rail cars, and new, larger grain hoppers. Entrepreneurs have also found ways to make the short-haul, Class III lines, abandoned by the large national Class I's, profitable, sometimes supported by state loans and grants to support local and state economic, including agricultural, interests.

Transit: Infrastructure Development and Operations

Historically. Whether powered by horses, steam, electricity, or petroleum, passenger transit by rail and road -- most of it developed by private companies with local concessions to operate on specific routes -- was critical to building the economy and quality of life in the nation's urban areas and many regions. Unregulated, horse-drawn public transportation came to prominence in the late 1820s (and became responsible for the first complaints of traffic congestion). Cable car technology, driven by steam-powered machinery in a powerhouse that continuously drew a loop of wire cables through a slot beneath the street, was an innovation of the late 19th century in many cities. Electric trolleys came to dominate the urban landscape for seventy years, with electrical power delivered through wires running overhead or in underground conduits.

The rapid increase in fuel-powered cars and trucks in the 1920s doomed the trolleys, which had come to be considered a traffic nuisance by some (in 1905, New York became the first American city to use motor buses for public transit), and during the 1930s and 40s, motor buses gradually replaced trolleys, though some trolley routes continued. Meanwhile, starting just after the Civil War, *rapid* transit was developed and flourishing, either elevated above or below the streets. Rapid transit allowed people to work further from where they lived, both providing congestion relief in the center city and encouraging people to move out of the center city. As metropolitan areas expanded, a number of private railroads met the need the need for peak period commuter rail services to shuttle commuters to and from the commercial centers.

Until the mid-20th century, the private sector built, owned and operated most of these transit systems, but local fare regulation and other factors caused most of the systems to be acquired by local/regional government.

Now. Beginning at the federal level under the Urban Mass Transportation Administration (now FTA) new opportunities have been sought for greater participation of the private sector in the provision and financing of transportation facilities and services. UMTA/FTA sought a way to leverage its available funds by requiring, as part of its project evaluation criteria, the commitment of local financial support (from state, local and private sources) for each project. UMTA/FTA also issued a policy requiring consideration of private sector transportation providers in the planning and delivery of transit services. And public transit authorities increased the use of private sector contractors for management, operations and maintenance.

Intermodal and Multi-Modal: Infrastructure and Vehicle Development, Coordination of Operations, Financial Support and Facilitation, Technological Development

Now. In the latter half of the 20th century, the private sector led the way in developing an intermodal freight transportation system and facilities; with the involvement of freight rail, trucking, airlines, and shippers, the private sector has created enormous economic efficiencies and value, while reducing transportation delays and prices, through its innovative efforts.

Beginning in the 1970s, growing congestion, inadequate capacity, and resulting local government regulations and approval processes led to the development of transportation demand management efforts -- the use of transportation coordinators/"brokers" and, later, Transportation Management Associations, subsidized transit passes, ridesharing matching services, preferential treatment for pooling vehicles, higher all-day parking fees, flexible work schedules, payroll deductions for transit passes and pooling activities -- largely under the leadership of private employers and developers.

In recent years, the private sector also has played a leading role in the development and deployment of ITS and related technologies for information and communications services and safety systems, as well as in-vehicle entertainment.

In addition, the private sector built and continues to provide most of the vehicles that operate on these systems, and on the public highways (and waterways) infrastructure.

USDOT and Other Federal Agencies with Role in Transportation

A Cabinet-level U.S. Department of Transportation (USDOT) did not exist until 1966 (92 years after the first legislation to establish such a department had been introduced [Grinder*], and the USDOT is by no means the only federal agency involved in fulfilling the federal role. In establishing the USDOT, President Lyndon Johnson found the federal role to be a natural outgrowth of the transportation need, with the justification that "America today lacks a coordinated transportation system that permits travelers and goods to move conveniently and efficiently from one means of transportation to another, using the best characteristics of each." USDOT consolidated more than thirty federal transportation agencies and functions that had been located throughout the government, including several of which had been in the Department of Commerce. Shortly thereafter (1968), the urban mass transit functions that had been part of the Department of Housing and Urban Development were also transferred to USDOT. Today, the Department of Transportation consists of the Office of the Secretary and eleven individual Operating Administrations: the Federal Aviation Administration, the Federal Highway Administration, the Federal Motor Carrier Safety Administration, the Federal Railroad Administration, the National Highway Traffic Safety Administration, the Federal Transit Administration, the Maritime Administration. The Saint Lawrence Seaway Development Corporation, the Research and Special Programs Administration, the Bureau of Transportation Statistics, and the Surface Transportation Board.

The mission of the U. S. Department of Transportation is to *Serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future.* It is the primary agency in the federal government with the responsibility for shaping and administering policies and programs to protect and enhance the safety, adequacy, and efficiency of the transportation system and

Other executive departments that play a part in the federal government's role in transportation include the Environmental Protection Agency, Homeland Security, Defense, Health and Human Services (accessibility), Interior and Commerce (endangered species), and the Advisory Council on Historic Preservation.

* Historian: Dr. Dale Grinder (DOT Library), 202 366-0754, "The United States Department of Transportation: A Brief History,"
<http://dotlibrary.dot.gov/Historian/history.htm>

National Economic Benefits of Transit Service

The growing federal role also reflects the national economic benefits of public transit service as calculated in the late 1990s: \$23 billion per year in affordable mobility for households that prefer not to drive, cannot afford a car, or cannot drive due to age or disability; \$19.4 billion per year in reduced congestion delays for rush-hour passengers and motorists; \$10 billion per year in reduced auto ownership costs for residents of location efficient neighborhoods; up to \$12 billion per year in reduced auto emissions; \$2 billion savings per year in local human service agency budgets; and a 2 percent boost in property tax receipts from commercial real estate.

Railroad Reregulation

The Struggle for Prosperity

A presentation by
Michael W. Blaszak
To the Sandhouse Gang
Northwestern University
September 28, 2006

Presentation Outline

1. A Short Review of Railroad Regulation
2. The Staggers Act
3. The ICC Termination Act of 1995
4. Reregulation Proposals
5. Analysis and Conclusions

A Short Review of Railroad Regulation

- Original Railroads Were Extremely Profitable
- Profits Encouraged Construction of More Railroads—Financed by Debt
- Rates (and Profitability) Declined Steadily after 1870
- Panic of 1873 and Strike of 1877
 - Railroad Progress Stalled

A Short Review of Railroad Regulation

- Efforts at Self-Regulation
 - The Iowa Pool (1870)
 - Southern Railway & Steamship Assn. (1875)
 - Southwestern Railway Assn. (1876)
- Most of these pools failed due to cheating

A Short Review of Railroad Regulation

- Eastern trunk lines' efforts to regulate rates never succeeded due to refusal of new competitors to cooperate
- Rebate demands from large shippers threatened to destabilize the entire system
 - Railroads looked to federal regulation largely to protect themselves from these shippers

A Short Review of Railroad Regulation

- Federal Regulation Efforts
 - 1st bill introduced in 1876
 - Supported by commercial interests opposed to rebates and attempting to retain perceived rate advantages
 - Railroads decided to support legislation to save their investment and avoid more onerous state regulation

A Short Review of Railroad Regulation

- The Interstate Commerce Act (1887)
 - Created Interstate Commerce Commission
 - Tariffs had to be filed with ICC
 - Rates must be “reasonable and just”
 - Long and short-haul rate discrimination outlawed
 - Rebates outlawed
- Weaknesses of Act
 - Law was vague and unenforceable
 - No power to set rates

A Short Review of Railroad Regulation

- Depression of 1893
 - 78,000 miles of line foreclosed 1893-98
 - Average rate declined 22% from 1890 to 1900
 - Rebating continued
- Sherman Anti-trust Act (1890)
 - Supreme Court determines pools violate the Act (1897)
 - Legislative efforts to legalize railroad rate pools fail

A Short Review of Railroad Regulation

- Elkins Act (1903)
 - Made rebates a criminal offense
- Hepburn Act (1906)
 - Empowered ICC to determine “just, fair and reasonable rates” and prescribe accounting system
 - Enacted commodities clause
- Mann-Elkins Act (1910)
 - Gave ICC regulatory authority over telephone service
 - Authorized suspension of proposed rate increases pending investigation
 - Shifted burden of proving rate reasonableness to carriers
 - Created Commerce Court (abolished 1913)

A Short Review of Railroad Regulation

- Federal Possession and Control Act (1917)/Railway Control Act (1918)
 - Placed railroads under control of the Federal Government
 - Impetus for elimination of duplicate facilities and services (peak mileage 254,000 (1916))
 - Operations were extremely unprofitable despite rate increases
- Transportation Act of 1920
 - Returned railroads to private control
 - Exempted railroads from Clayton Act
 - Authorized ICC to approve and regulate pooling

A Short Review of Railroad Regulation

- Transportation Act of 1920 (cont'd)
 - Provided for valuation of railroads and rate levels intended to generate 5 ½-6% return on investment
 - ICC authorized to set minimum rates
 - Gave ICC jurisdiction over mergers, line construction, line abandonment, issuance of securities
 - Directed ICC "to prepare and adopt a plan for consolidation . . . into a limited number of systems"

A Short Review of Railroad Regulation

- Filed Rate Doctrine (*Keough v. C&NW*, 1922)—foreclosed antitrust challenges to rates found reasonable by ICC
- Railroad Consolidation Plans
 - Railroads could not agree on details
 - Effort abandoned during the Depression
- Depression substantially reduced traffic
 - About one-third of operators bankrupt by 1937
 - Emergency Railroad Transportation Act (1933)

A Short Review of Railroad Regulation

- Motor Carrier Act of 1935
 - ICC gained jurisdiction over motor carrier market entry and tariffs
- Transportation Act of 1940
 - Gave ICC jurisdiction over water carriers
 - Formally withdrew consolidation mandate
- Reed-Bulwinkle Act (1948)
 - Exempted rate bureaus from Sherman Act
- Transportation Act of 1958
 - Authorized ICC to approve passenger service discontinuance notwithstanding state regulatory action

A Short Review of Railroad Regulation

- Procedural issues stifled railroad rate innovation in the 1960s
 - SR "Big John" hopper case
 - IC "Rent a Train" case
 - Car service requirements
- Railroads were unable to recover cost increases as they were incurred in an inflationary environment
- Interstate Highway System increased motor carrier productivity

A Short Review of Railroad Regulation

- Abandonments could not be effected without protracted proceedings
- Passenger and commuter train losses debilitated railroads
 - Rail Passenger Service Act (1970)—created Amtrak
 - Local authorities slowly bought or began subsidizing commuter operations
- Maintenance was deferred, reducing efficiency and increasing derailments
- Result: bankruptcies
 - Penn Central (1970)
 - Rock Island (1975)
 - Milwaukee Road (1977)

A Short Review of Railroad Regulation

- Regional Rail Reorganization Act (1973)
 - Created Conrail
- Railroad Revitalization and Regulatory Reform Act (1976)
 - Required finding of “market dominance” (“absence of effective competition”) to challenge rates
 - Commenced changes in costing
 - Provided for regulatory exemptions
 - Perishables and unprocessed agricultural commodities
 - Optional time limits for merger proceedings
 - Appropriated funds for capital investment
- MRRA (1979) and RITA (1980)

The Staggers Act

■ Background

- Conrail was highly unprofitable
- Milwaukee and Rock Island bankrupt
- Overall industry rate of return was 1% in 1978 (cost of capital 10.6%)
- Significant overcapacity
- Lightly-utilized branch lines in poor condition
- Stagnant traffic and declining market share
- Rate regulation seen as key impediment to profitability

The Staggers Act

- Became effective October 1, 1980
- Key provisions
 - Sets revenue adequacy as regulatory policy
 - Limited rate regulation
 - ICC has jurisdiction to consider reasonableness of rate only if railroad has market dominance
 - If rate is $< 180\%$ of variable cost, railroad does not have market dominance
 - Shipper has burden of proving market dominance

The Staggers Act

- Confidential transportation contracts legalized
- Exemptions mandated where regulation is not necessary to promote transportation policy, and transaction is of limited scope and regulation not necessary to protect shippers from market power
- Merger standards revised to promote consolidation
- Time limits imposed on merger and abandonment proceedings
- Rate bureau activity constricted

The Staggers Act

- Companion Legislation
 - Motor Carrier Act of 1980
 - Northeast Rail Service Act (1981)
 - Rationalization of Conrail
 - Transfer of commuter service
- Results 1980-1995
 - Significant segments of railroad traffic exempted from regulation
 - Intermodal
 - Boxcars
 - Substantial proportion of traffic moved under contracts
 - Many joint rates/routes eliminated

The Staggers Act

- Results 1980-1995 (cont'd)
 - Major railroads reduced to “Super Seven” plus C&NW, KCS, IC, Guilford, FEC
 - Conrail privatized (1987)
 - Powder River Basin coal traffic soars following C&NW/UP entry into Basin (1984)
 - Introduction of double-stack equipment promotes profitability of intermodal service

The Staggers Act

- Results 1980-1995 (cont'd)
 - Total railroad mileage declines approx. 32,000 due to abandonments
 - Short line/"regional railroad" spinoffs reduce Class 1 mileage
 - The average rate level declines, but rates on specific traffic increase
 - Affected traffic generally cannot be shifted to truck or barge and has no rail competitive alternative
 - Railroads accelerate productivity improvements to maintain profitability

The Staggers Act

- Captive shippers lobby for changes in the Staggers Act
 - CURE (Consumers United for Rail Equity) formed (1983)
 - Make rate reasonableness proceedings simpler
 - Provide more procedural safeguards in abandonment cases
- Reregulation Proposals
 - Rockefeller bill (rate relief)
 - DeConcini-Seiberling bills (open access refereed by federal courts)
- Senate Committee fails to report out reform legislation by one vote (1988)

ICC Termination Act of 1995

- Resulted from truck undercharge phenomenon
- Negotiated Rates Act of 1993
- Congressional proposals to abolish ICC and eliminate its budget
- Clinton Administration backs termination of ICC

ICC Termination Act of 1995

- ICC abolished effective December 31, 1995
- STB created on January 1, 1996
 - Independent agency within DOT
 - Former ICC Commissioners were first three board members
 - Budget appropriated for three years

ICC Termination Act of 1995

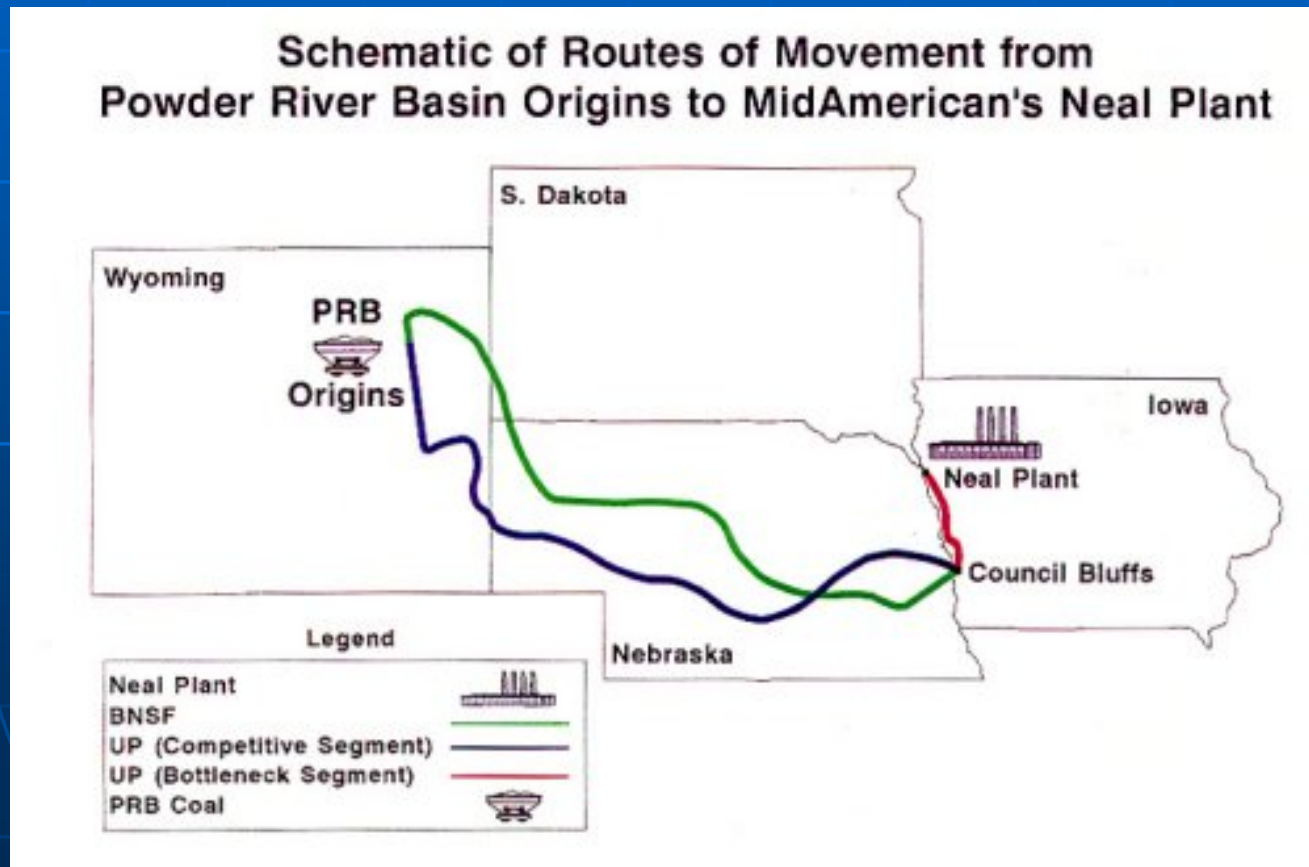
- Changes in Railroad Rate Regulation
 - Eliminated tariff filing requirement
 - Eliminated authority to establish minimum rates
 - Eliminated authority to investigate and suspend rates
 - Repealed Elkins Act prohibition against rebates

ICC Termination Act of 1995

- Changes in Railroad Rate Regulation (cont'd)
 - Recognized stand-alone cost methodology as standard in rate reasonableness cases
 - Simplified procedure for smaller cases to be developed in one year (it was, but it's rarely used)
 - Imposed time limits for rate and exemption cases
 - Repealed commodities clause and valuation provisions

ICC Termination Act of 1995

- "Bottleneck" Cases



ICC Termination Act of 1995

- “Bottleneck” cases (cont’d)
 - Shipper routes traffic from origin to destination on one railroad
 - Shipper obtains rate from competing carrier to junction near destination
 - Shipper wants incumbent railroad to quote rate on terminal, or “bottleneck,” segment from junction to destination
 - Rate could be challenged if $> 180\%$ of variable cost or stand-alone cost
 - STB: “Bottleneck” carrier is not required to quote separate rate over terminal segment (*Central Power & Light Co. v. Southern Pacific T. Co.* (1996))

ICC Termination Act of 1995

- Mergers approved
 - UP-C&NW (1995, by ICC)
 - BN-Santa Fe (1995, by ICC)
 - UP-SP (1996)
 - Conrail split-up (CSX and NS) (1999)
 - CN Expansion
 - IC (1999)
 - WC (2001)
 - GLT (2004)
 - KCS-TFM (1996-2004)

ICC Termination Act of 1995

- Severe postmerger operating disruptions
 - UP-C&NW (1995)
 - UP-SP (1997-98)
 - Conrail (1999-2001)
- CN-BNSF merger proposal blocked (2000)
- New, more restrictive merger rules (2001)

ICC Termination Act of 1995

■ Results

- Class I network in U.S. reduced to 97,500 route miles (out of 140,800 total)
- Freight traffic (U.S. ton-miles) increased 57% 1990-2005
- Rates declined through 2000 by most measures, then increased
- Substantial improvement in Class I profitability in 2005-06

Reregulation Proposals

- The Problem—Captive Shippers Miss Out on Deregulation's Benefits
 - Examples (from C.U.R.E.)
 - Laramie River Station, WY—Upon expiration of 20-year transportation contract in 2004, BNSF imposed tariff rate doubling freight costs (> 400% rate/variable cost ratio, 175-mile haul).
 - Total Petrochemical (Carville, LA)—Plant solely served by CN; rate to New Orleans (81 miles) is \$1,000. By contrast, rate from Laporte, TX to New Orleans (405 miles, BNSF and UP compete) is \$1,234.

Reregulation Proposals

- Lafayette Utilities System (Boyce, LA)—UP refuses to quote rate on 20-mile bottleneck segment, precluding competitive BNSF-KCS service. \$60 million “build-out” to KCS is cost-prohibitive.
- Entergy Arkansas, Inc. (near Newark, Ark.)—Plant is served by UP and M&NA (UP spinoff). M&NA runs from plant to Kansas City and theoretically could receive Powder River Basin coal from BNSF there, creating a competitive alternative. However, UP’s lease to M&NA imposes sharply increasing rent if M&NA fails to interchange 95% of traffic with UP, creating a “paper barrier.”

Reregulation Proposals

- Arizona Electric Power Cooperative (Tucson, AZ)—Cost of unresolved coal rate challenge at STB exceeds \$3 million and has taken four years (vs. 16-month procedural deadline)
- GAO Analysis (June 2006)
 - Total U.S. rail traffic moving on rates > 180% of variable cost = 31%
 - Total U.S. rail traffic moving on rates > 300% of variable cost = 6%
 - Concentrated in specific geographic areas (e.g., Montana grain, West Virginia coal)

Reregulation Proposals

■ Pending Bills

• Senate

- S.919—Railroad Competition Act (introduced by Sen. Conrad Burns (R.-Mont.) April 27, 2005)
- S.2921—Railroad Competition Act of 2006 (introduced by Sen. Mark Dayton (D.-Minn.) May 22, 2006) (essentially the same bill)
- Both bills are in the Senate Commerce, Science and Transportation Committee

Reregulation Proposals

■ Pending Bills

• House

- H.R. 2047—Railroad Competition and Improvement Reauthorization Act of 2005 (introduced by Rep. Richard Baker (R.-La.) May 3, 2005) (similar, but not identical, to the Senate bills)
- Bill is in the House Transportation and Infrastructure Committee, Subcommittee on Railroads

Reregulation Proposals

- Issue: Bottleneck Rates
 - Proposed Response: Mandate rate-setting requirement
 - H.R. 2047: "Upon the request of a shipper, a rail carrier shall establish a rate for transportation and provide service requested by the shipper between any two points on the system of that carrier where traffic originates, terminates, or may reasonably be interchanged."

Reregulation Proposals

- Issue: Paper Barriers
 - Proposed Response: Prohibit them
 - H.R. 2047: “The Board may not . . . [approve or exempt] . . . a transfer of interest in a line of railroad, from a Class I rail carrier to a Class II or a Class III rail carrier, if the activity directly or indirectly would result in– (A) a restriction of the ability of the Class II or Class III rail carrier to interchange traffic with other carriers; or (B) a restriction of competition between or among rail carriers in the region affected by the activity in a manner or to an extent that would violate antitrust laws of the United States”
 - Transfers up to 10 years old could be challenged retroactively

Reregulation Proposals

- Issue: Competitive Access
 - Proposed Response: Mandated Reciprocal Switching
 - S.919: In 49 U.S.C. §11102(c), change “may” to “shall” require reciprocal switching arrangements and add “In making any finding for the purposes of the first sentence of paragraph (1), the Board may not require that there be evidence of anticompetitive conduct by a rail carrier from which access is sought.” (Would reverse Competitive Access Rules and *Midtec Paper* case)

Reregulation Proposals

- Issue: Single-Railroad Domination of Geographic Areas
 - Proposed Response: Designate areas of inadequate rail competition
 - H.R. 2047: STB can designate an AIRC when “(1) the State or substantial part of the State encompasses rail shipping origins and destinations that are served exclusively by one Class I railroad;” and (2) pay rates that “exceed the rates necessary to yield recovery by the rail carrier of 180 percent of revenue-variable costs, or have experienced competitive disadvantage in the marketplace or other economic adversity because of high cost or poor quality of rail service . . .”

Reregulation Proposals

- Proposed Response: Designate areas of inadequate rail competition (cont'd)
 - AIRC may be limited to “the facilities of a group of shippers or receivers of one or more specific commodities within a geographic area”
 - STB may impose any of these remedies within an AIRC: (1) reciprocal switching; (2) haulage; (3) “baseball” arbitration; (4) rate review (rates may not be set at < 180% R/VC); (5) expedited review of possible “unreasonable discrimination”

Reregulation Proposals

- Issue: Rail Rate Challenges Are Too Cumbersome and Expensive
 - Proposed Response: Arbitration
 - H.R. 2047—At election of either party; S.919—at election of non-carrier only
 - “Baseball” arbitration (imposed rate may not be < 180% R/VC)
 - Effective competition standard: arbitrators may consider rates for comparable movements where competition exists
 - Also, filing fees in conventional rate cases capped at U.S. District Court filing fees

Reregulation Proposals

- Issue: Rate Reasonableness Determinations Skewed in Railroads' Favor
 - Proposed Response: (H.R. 2047) "The Board shall adopt a method for determining the reasonableness of rail rates based on the railroad's actual costs, including of a portion of fixed costs and an adequate return on debt and equity. The method adopted shall permit a final determination within 9 months after filing a complaint, shall ensure that necessary cost and operational information is available to the complainant, and shall not require excessive litigation costs. The Board shall not use any method for determining the reasonableness of rail rates based on the costs of a hypothetical competitor "

Analysis and Conclusions

- What is the purpose of regulation?
 - To protect the railroads, or their customers?
 - Congress must strike the desired balance between these competing interests
 - The public interest should be the determining factor—policies should maximize the public welfare

Analysis and Conclusions

- Public Interest Considerations
 - Promoting industrial, agricultural and mining activity that most efficiently uses society's resources
 - Promoting modes of transportation that most efficiently move people and products

Analysis and Conclusions

- In general, U.S. regulatory policy is to allow competition to govern the allocation of resources
- If there is effective competition, there should be no need for government regulation of pricing or service
- What should happen when there is no effective competition?

Analysis and Conclusions

- “Differential Pricing”
 - Railroads defend concept on economic grounds: we need to charge higher-than-competitive rates where effective alternatives do not exist to support investment in the railroad system
 - Shippers attack concept on public policy grounds: we should not have to pay higher-than-competitive rates just because we are located in places where no effective alternatives exist

Analysis and Conclusions

- “Differential Pricing”
 - Impact of differential pricing, long-term, is to discourage production where no effective competition exists
 - Is demand for the product sufficiently strong to overcome this disadvantage?
 - Put another way, are product alternatives and alternate geographic sources of supply available to consumers?
 - But the impacts are probably too long-term to affect railroad pricing decisions

Analysis and Conclusions

■ Bottleneck Rates

- Mergers and regulatory policies after Staggers reduced availability of alternate joint routes
- If purpose of these policies was to improve financial results of railroads, should they be revisited once that purpose is realized?
- Possible compromise: Require railroads to quote rates on bottleneck segments, but increase the R/VC ratio threshold for review of such rates to ensure railroads are compensated for their stronger competitive position (and additional switching costs)

Analysis and Conclusions

■ Paper Barriers

- 1980s-90s spinoffs should be recognized as not changing basic Class I-shipper economic relationships
 - Most spinoffs were valued on the assumption that Class I would retain the right to price through traffic originating/terminating on the spinoff
 - Price would have been higher in most cases if Class I were truly "selling the business"

Analysis and Conclusions

- Paper Barriers (cont'd)
 - Purpose of paper barriers was to allow railroad to maintain control of through movement pricing, without creating new competition
 - Prospective prohibition would inhibit railroads' freedom to sell and/or refinance their assets
 - Retroactive abrogation would raise constitutional takings issues

Analysis and Conclusions

■ Competitive Access

- Is this any different than the bottleneck rate issue?
 - If switching carrier does not serve origins or destinations, presumably it will not attempt to foreclose competition between carriers that do
 - Presumably, shorter distances involved, and build-outs may be a more viable tool for shippers to gain additional competition or rate relief
- If not, shouldn't the same resolution apply?

Analysis and Conclusions

- Areas of Inadequate Rail Competition
 - This would create competition where none existed before
 - Regulatory policy is to address above-market rates through rate reasonableness proceedings
 - Rates capped at 180% R/VC not necessarily high enough to achieve revenue adequacy
 - Some proposed remedies (trackage rights) could result in significant operating problems and/or additional costs

Analysis and Conclusions

- Arbitration of Rate Disputes
 - Baseball arbitration has been adopted in another industry context
 - Car hire disputes under depreservation
 - Potential savings in time and cost
 - Possible two-step process
 - STB makes market dominance determination within strict time limits
 - If market dominance is found, case proceeds to baseball arbitration (rate cannot be less than 180% R/VC, except in bottleneck cases)
 - Average industry costs may be used to support final offers

Analysis and Conclusions

- Eliminate Stand-Alone Costing
 - Under baseball arbitration system, parties could use stand-alone costing to support their cases, but would not be required to do so

Analysis and Conclusions

■ Conclusion

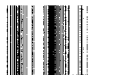
- Shippers and railroads have been struggling over their relative prosperity for over a hundred years
- While the struggle won't end soon, modest statutory reforms should adequately address issues raised by shippers without materially adverse consequences for the railroads

**NEW DIRECTIONS FOR THE
NATION'S PUBLIC WORKS**

**The Congress of the United States
Congressional Budget Office**

For sale by the Superintendent of Documents, U.S. Government Printing Office
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PREFACE

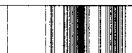
Concern is widespread over the condition of the nation's public works infrastructure. At the request of Senator Lawton Chiles, Chairman of the Senate Budget Committee, this study assesses the federal programs for highways, mass transit, aviation, waterways, and wastewater treatment, and discusses policies that the Congress might consider to improve the effectiveness of these programs. In keeping with the mandate of the Congressional Budget Office to provide objective analysis, it makes no recommendations.

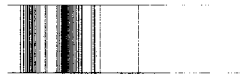
This study also fulfills the requirement of Public Law 98-501 that the Congressional Budget Office review the findings of the National Council on Public Works Improvement. The body of this paper considers some of the broader issues raised by the Council's final report, *Fragile Foundations: A Report on America's Public Works* (1988); the appendix focuses more specifically on the Council's findings.

Michael Deich and Jenifer Wishart of CBO's Natural Resources and Commerce Division wrote the report under the supervision of Everett M. Ehrlich. Daniel Kaplan, Larry Ozanne, and Robin Seiler of CBO made substantial contributions to the report. Helpful suggestions were received from Mark Dayton, Theresa Gullo, Robert Hartman, Linda Radey, Deborah Reis, and Mitchell Rosenfeld, also of CBO. The authors are grateful for the critical comments and helpful remarks of David Williams and Steven Hornburg of the Senate Budget Committee staff. External reviewers offering valuable comments included Harry B. Caldwell, David L. Lewis, Regina McElroy, and Arlee Reno. The manuscript was edited by Francis S. Pierce. Gwen Coleman typed the many drafts, and Nancy H. Brooks and Kathryn Quattrone prepared the report for publication.

James L. Blum
Acting Director

September 1988





CONTENTS

	SUMMARY	xi
I	HIGHWAYS	1
	The Changing Federal Role 1	
	Achievements of the Highway Program 4	
	The Outlook 11	
	Policy Options for the Federal Highway Program 17	
II	MASS TRANSIT	27
	The Changing Federal Role in Mass Transit 27	
	What Has Been Accomplished 31	
	The Outlook 44	
	Policy Options for the Federal Transit Program 46	
III	AVIATION	55
	The Changing Federal Role in Aviation 55	
	Achievements 58	
	The Outlook 71	
	Options for Federal Aviation Policy 75	
IV	WATER TRANSPORTATION	79
	The Changing Federal Role in Water Transportation 79	
	Water Transportation Achievements and Outlook 85	
	Policy Options for Waterways and Ports 89	

V	WASTEWATER TREATMENT	95
	The Changing Federal Role in Water Pollution Control 95	
	Achievements in Water Pollution Control 97	
	The Outlook for Water Pollution Control 98	
	Policy Options for Wastewater Treatment 102	
VI	COMPREHENSIVE STRATEGIES	113
	Is Greater Competition Among Infrastructure Forms Desirable? 113	
	Comprehensive Infrastructure Options 116	
APPENDIX	The Report of the National Council on Public Works Improvement 129	

TABLES

S-1.	Federal Infrastructure Spending, 1988	xii
1.	Federal Programs for Highways, 1987-1992	3
2.	Investment and Returns on Highway Maintenance, 1984-1985	8
3.	Alternative Estimates of Federal Highway Taxes and Spending	11
4.	Prospective Returns on Investment for Five Highway Maintenance Strategies, Under Low and High Traffic Growth	14
5.	Economic Priorities for Highway Investment	18
6.	Work Trips and Transit Use in 1970 and 1980	33
7.	Performance and Condition of Transit Fleets, 1985	34
8.	Comparative Performance of Bus Agencies, by Size	40
9.	Transit Performance in Cities With New or Recently Expanded Rail Transit Systems	42
10.	National Financing for Aviation Facilities and Services, 1986	60
11.	Alternative Estimates of Aviation Taxes and Spending, 1971-1987	65
12.	Sources of Airport Investment	67

13.	Projected Development Costs for the Airport System, by Program Objective, 1986-1995	73
14.	Inland Waterway Traffic, 1985	81
15.	Principal Commodities in Inland Waterborne Commerce, 1985	82
16.	Federal Outlays and Revenues: The Inland Waterway System	83
17.	Federal Expenditures and Cost Recovery for Ports and Harbors	84
18.	Federal Port Operations and Maintenance Outlays per Ton of Cargo, 1977-1984	88
19.	Traffic and Operations and Maintenance Outlays on the Inland Waterways System, 1985	91
20.	Effect of Cost-Sharing on Harbor Improvements	94
21.	Changes in Water Quality, 1972-1982	99
22.	Costs of Wastewater Treatment Facilities Needed to Meet the Clean Water Act Requirements for the 1986 Population, by State	100
23.	Comparison of Federal Outlays for Municipal Wastewater Treatment Under the President's Proposal and Under a Proposal to Cancel Capitalization Grants	104
24.	Grant Equivalence of State Revolving Fund Loans at Various Interest Rates	106

25.	Allocation of Annual Federal Wastewater Treatment Grants, 1989-1991	107
A-1.	Annual Infrastructure Investment Needs	131

FIGURES

1.	Changes in Average Highway Pavement Conditions, 1975-1985	7
2.	Average Annual Obligations of Federal Aid for Transit	30
3.	Distribution of Formula Aid and Indicators of Transit Need, by City Size	39
4.	Sources of Revenue for the Airport and Airway Trust Fund, 1983-1987	62
5.	Federal Funding for Airports and Airways in 1986	63
6.	Recipients of New Federal Airports Grants Approved From 1983 Through 1987	68
Box 1.	An Example of Tranching	23



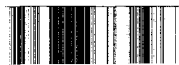
SUMMARY AND INTRODUCTION

The importance of the nation's public works infrastructure has been demonstrated recently by mounting delays in highway and air travel and by dramatic episodes such as the closing of the Williamsburg Bridge in New York City. While concern for the state of infrastructure is widespread, no consensus yet exists on how to improve the effectiveness of infrastructure programs or how to pay for them. This report examines ways to reconcile the need for a sound infrastructure with the Congress's commitment to fiscal restraint.

In the last three decades, the federal government has greatly expanded its role in providing public works infrastructure. While continuing its century-old commitment to build major water resources projects, the government has also subsidized state and local investment in transportation and in environmental facilities. By 1988, federal infrastructure outlays totaled \$26.6 billion (see Summary Table).

Over the years, the Congress has periodically assessed the adequacy and efficiency of these programs. Recently, the focus of the reviews has shifted from the problems and prospects of individual programs to issues common to infrastructure policies generally. In 1983, for example, the Joint Economic Committee of the Congress conducted a wide-ranging survey of the nation's infrastructure problems. In 1984, the Congress established the National Council on Public Works Improvement to assess the state of the infrastructure. The Congressional Budget Office is required by Public Law 98-501 to review the findings of this Council. Accordingly, the study reviews some of the issues raised by the Council's final report, *Fragile Foundations: A Report on America's Public Works* (1988); the appendix focuses more specifically on the Council's findings.

Two difficulties arise in attempting an overall assessment of infrastructure programs. The first is the difficulty of defining infrastructure. This report analyses five major infrastructure modes--highways, aviation, mass transit, wastewater treatment, and water transportation--that are consistent with a definition of infrastructure as those facilities that provide a foundation or basic framework for the



national economy, and in which federal policy plays a significant role. A sixth area consistent with this definition--groundwater and surface water resources--will be addressed in a future CBO report. This definition excludes some facilities often thought of as infrastructure--such as public housing, government buildings, private rail service, and schools--and some environmental facilities (such as hazardous or toxic waste sites) where the initial onus of responsibility is on private individuals.

The second difficulty arises in determining how well a particular set of policies meets the variety of objectives that governments pursue in supporting infrastructure development. Here different viewpoints enter--those of economic efficiency, social policy, and national defense, among others. This study is written from an economic perspective and appraises programs in terms of their cost-effectiveness. At the same time, it recognizes that criteria of economic efficiency may have to give way at times to social or political considerations.

SUMMARY TABLE . FEDERAL INFRASTRUCTURE SPENDING, 1988
(In billions of dollars)

Infrastructure Area	Outlays	Percent of Total
Highways	13.64	51
Mass Transit	3.50	13
Aviation	5.31	20
Water Transportation	1.17	4
Wastewater Treatment	<u>2.94</u>	<u>11</u>
Total	26.56	100

SOURCE: Congressional Budget Office.

NOTE: Excludes spending for water resources other than water transportation.

The extent to which the different infrastructure areas examined here share common characteristics is striking. While important differences exist, the infrastructure areas (or "modes") can be thought of as alike in four ways: they have *common origins*, they have made *common achievements*, they face *common challenges*, and their problems may have *common solutions*. Recognizing these common characteristics should help to set new directions for infrastructure programs.

COMMON ORIGINS

The nation's infrastructure programs were created to serve many purposes, but federal involvement was motivated by three principal concerns. First was the need for coordination. Federal programs in highways, airports, air traffic control, and inland waterways were undertaken because no other jurisdiction could plan a system of such facilities from a national perspective. If left to their own devices, for example, localities would underinvest in roads (since many of the benefits of these investments accrue to people outside their boundaries) or in air traffic control (where a single national system is needed to make commercial air transit possible). Federal programs were designed to lead localities to make investments from a national rather than a local perspective, or to make national investments where localities otherwise would have little reason to do so.

The second motivation for federal involvement was to spread the financial burden. For example, after requiring that all municipalities clean their water to a minimum standard, the federal government provided funds to help them build wastewater treatment plants that would attain this standard. Similarly, when faced with a wave of private transit financial failures in central cities, the Congress enacted a federal mass transit program to lighten the burden of putting these fleets back into operation.

A third motivation was to promote social policy goals. Inland waterways, ports, and water supply projects were all subsidized as a way of promoting or revitalizing economic development in individual regions. Mass transit was seen as part of a policy to revitalize urban

cores. Mass transit, aviation, and highways were all conceived, in part, as ways to increase the mobility of the population and to integrate the various regions of the country. In this sense, infrastructure programs have actively sought social goals as a collateral benefit of economic expansion.

COMMON ACHIEVEMENTS

The infrastructure programs share common achievements in two respects: almost all have accomplished their initial goals to a great degree, and together they have forced state and local governments to develop bureaucracies capable of planning, administering, and financing these areas of public life--so much so that many states are now widely recognized as imaginative infrastructure managers.

While all the nation's infrastructure facilities may never be "finished" since there will be ongoing needs for maintenance, expansion, and replacement, significant accomplishments have been made in all areas of infrastructure. The Interstate Highway System as currently planned is about 98 percent complete, and all funds needed for its completion will be obligated by 1993. The United States now has more highways per person than any other industrialized country; its roads are used at only about 15 percent of capacity in rural areas and 40 percent of capacity in urban areas. Water supply projects have led to the regional development of the West, so much so that the Bureau of Reclamation now believes that adequate water supplies often can be achieved more efficiently through conservation than through new construction. About 90 percent of the wastewater treatment plants needed to meet current regulatory standards have been built; as a result, the ongoing deterioration in water quality prevalent only two decades ago has been arrested.

The standard of achievement is not uniform. Mass transit programs have often encouraged localities to apply incorrect solutions to their transit problems: new systems in Miami, Washington, D.C., Pittsburgh, and Atlanta have all raised the cost of providing transit while attracting far fewer riders than predicted. Nationwide, the use of trains and buses continues to decline except for trips from suburbs to urban centers, but such trips now account for only one-seventh of

trips to work. Although the largest urban rail systems--New York City, Chicago, Philadelphia, and Boston--are in need of renovation, many smaller urban systems have more capital equipment than they can use although they are still drawing operating subsidies from the federal government. In air transportation, the antiquated traffic control system is a major source of delays, and the rapid recent growth in air traffic has brought peak-hour congestion to the airports.

The federal government's initiatives have also led state governments to become more productive partners in infrastructure management. State governments are now more capable of managing their infrastructure systems and many are widely recognized as being innovators in infrastructure finance.

COMMON CHALLENGES

The various infrastructure modes confront, each in its own fashion, similar sets of challenges. The most important of these may be the transition from an era of construction to an era of management. Just how well federal infrastructure programs perform in this new era will depend, in part, on the incentives that the programs offer to infrastructure users and to state and local infrastructure managers. Federal programs now also confront an institutional environment far different from that for which they were designed.

Management

The transition from an era of construction to one of maintenance, rehabilitation, and replacement is evident in almost all modes. In highways, for example, the rate of return on maintaining the condition of the federal-aid highway system is on the order of 30 percent to 40 percent, while the rate of return on new construction, save in certain urban areas, is very low. For aviation, the most pressing general need is to modernize the air traffic control system.

In mass transit, newly constructed systems have not reversed the decline in transit's share of commuting. Nationwide, mass transit operates at a low level of productivity, and transit fleets are too large. A

contradiction may be seen in that the older major urban systems need repair, while nationally an unobligated balance of \$850 million sits in transit accounts for lack of new construction projects that qualify for aid.

Similarly, about half of the locks and dams on the inland waterway system will have exceeded their design lives by the year 2000. Many of these locks will require major rehabilitation.

Construction is not a thing of the past, but where construction is needed (as it is to some extent in all modes), the needs are regional rather than national. Moreover, the needs are typically for alleviating congestion rather than anticipating or promoting growth. The area farthest from its initial goal may be wastewater treatment: the Environmental Protection Agency estimates the remaining need for wastewater treatment plants at a total construction cost of \$76 billion between now and 2005. Perhaps half of these outlays, however, would be needed even in the absence of federal statutes.

Incentives

As currently structured, federal infrastructure programs fail to provide either infrastructure users or state and local managers with incentives to make efficient choices. Since the benefits of using facilities are not tied to the costs of providing them, federal programs lead to inflated perceptions of the demand for infrastructure. The current programs also give state and local managers no incentives to solve infrastructure problems with "nonstructural" approaches, and often encourage them to select projects that create local, rather than national, benefits.

Infrastructure managers must not only decide what facilities to build, but also price them in a way that will optimize their use. Charging prices that are too high would lead to underuse and reduce the productivity of the infrastructure investment, while making roads, ports, and mass transit available without charge would lead to their overuse and rapid deterioration. In only two of the seven major federal programs--highways and airports--are fees now high enough to defray most of the federal spending. And even in these programs, some users--notably, operators of heavy trucks and private planes--

pay less than their share of costs, while other users--light truck operators and airline passengers--make up the difference by paying fees that recover more than the costs they create. In each of these programs, below-cost pricing leads users to request more infrastructure services than they are willing to pay for, while planners get an exaggerated perception of investment needs from these misleading signals about infrastructure demand.

Water transportation projects are conspicuous in their failure to charge users for the costs of water transportation. The 1986 Omnibus Water Resources Development Act required that user fees finance up to 50 percent of the costs of new construction, but in 1988 user fees still covered only 21 percent of the Corps of Engineers construction costs on inland waterways and 9 percent of total Corps costs for inland navigation. Thus, users of the inland water system are subsidized while those who use competing freight modes--particularly rail--are not. Water projects also deliver water that is allocated through historical rights at prices far below costs, leading to overconsumption and underinvestment in conservation. Ironically, this overconsumption of water, particularly in agriculture, increases water runoff and, in turn, water-based pollution and the need for treatment of rivers and streams.

Another set of common problems arises from the incentives given to state and local infrastructure managers. First, the structure of federal financial assistance leads state and local infrastructure managers to substitute federal funds for their own. This phenomenon of "fiscal substitution" takes place in a variety of infrastructure modes, most notably in wastewater treatment (where federal grants appear not to have led to more rapid construction of wastewater plants and may have led to actual deferrals of plant construction). Substituting federal for local funds also occurs in highway programs outside the original Interstate system (where statistical evidence suggests that federal assistance has had far less than its maximum impact).

Second, even where it has truly added to spending, federal assistance may have altered the choices made by local officials without satisfying federal interests. In mass transit, for example, where capital purchases are subsidized to a far greater extent than are maintenance expenditures, municipalities regularly retire buses before the end of their useful lives and purchase new equipment with federal

funds in excess of service requirements. In wastewater treatment, plants have commonly been built to subsidize local economic expansion rather than to service current needs.

Institutions

A final challenge that confronts all infrastructure programs is a changing institutional environment. Regions that once depended on inland water transportation now have new alternatives as a result of changing technology and the deregulation of most transportation industries. The deregulation of air travel has led to a more efficient system of "hubs and spokes" for airlines, requiring airports to be more flexible while at the same time leaving them more vulnerable to changes in airline routing. State and local governments, and the capital markets that serve them with funds, are learning how to manage and appraise infrastructure projects. In addition to the traditional general obligation bonds, many state governments now employ new devices such as bond banks, revolving loan funds, and special taxing authorities to finance their projects.

COMMON SOLUTIONS

The chapters that follow evaluate a wide range of options intended to make federal infrastructure policies more responsive to current challenges. While differing in their details, most of these options stem from four approaches: pricing infrastructure services more efficiently; targeting federal assistance more effectively; assigning more infrastructure responsibilities to states and localities; and fostering greater competition among different forms of infrastructure for federal funds. These approaches seek more cost-effective infrastructure programs. Cost-effectiveness is not the only goal of infrastructure spending, however, and sometimes may conflict with other goals such as income redistribution or the economic development of particular regions.

Pricing Infrastructure Services

Better pricing of infrastructure services--that is, more reliance on user fees--would help to achieve a number of goals. Better pricing could reveal how much people value different infrastructure services; by giving managers better information about the cost-effectiveness of different projects, user charges could enable them to improve their investment decisions. Proper pricing could also ameliorate congestion, whether that congestion is specific to particular localities (as with highways and inland waterways) or to particular times of day (as in aviation). Varying airport landing fees by time of day, for instance, would shift some traffic to off-peak hours. Similarly, user fees at locks and dams on the inland waterways systems could cause some cargo to be shipped by rail or other alternative systems.

Most existing user fees are designed simply to recover some portion of infrastructure costs. While increasing those fees could help finance infrastructure investment, it would do little to increase the efficiency of that investment. Most current fees--the highway gas tax, the inland waterways fuel tax, the harbor maintenance tax, the airline ticket tax--are the same throughout the country, although both the demand for services and the cost of providing them vary dramatically by place and time. Current fees reveal little about how users value particular facilities and thus do little to direct investment toward projects that benefit users most. Similarly, landing fees that do not vary with the time of day can recover an airport's relevant operating costs but do little to reduce peak-hour congestion. In many cases, efficient infrastructure pricing would require changes in the structure and the level of fees.

An increased reliance on user fees has two drawbacks. First, the efficient use of facilities may not be the only goal of an infrastructure program. To the extent that federal subsidies are intended to provide nonmonetary income transfers (as in the cases of federal support for water supply, mass transit, and aviation services to small towns), increased user fees clearly would be at odds with this purpose. Sometimes infrastructure programs are intended to spur regional economic development, and in such cases user fees would reduce the regional subsidy.

THE ROLE OF PRIVATE TRANSPORTATION IN AMERICA'S 19th-CENTURY "INTERNAL IMPROVEMENTS" DEBATE

By Thomas J. DiLorenzo
tdilo@aol.com

Professor of Economics
Sellinger School of Business and Management
Loyola College in Maryland

For the first sixty years of the nineteenth century a key point of contention between the two major political factions in America -- the more-or-less laissez faire Jeffersonians and the mercantilist Hamiltonians -- was the issue of government subsidies for "internal improvements." Beginning with Hamilton at the turn of the century, and then the Whig party (led by Henry Clay) from 1832 until its demise in 1852, and then the Republican party from its formation in 1856, there was always a political faction that favored the adoption of British-style mercantilism in America.

The opponents of this system included Jefferson, John C. Calhoun, James Madison, James Monroe, and Andrew Jackson. Jefferson, Monroe and Madison believed that taxpayer subsidies to businesses were unconstitutional; Calhoun led the fight against protectionist tariffs designed to pay for corporate subsidies; and Jackson defeated the effort to recharter the Bank of the United States while vetoing myriad internal improvement bills while president.

Central banking and protectionist tariffs were two of the key “planks” of the American mercantilist “platform” during this era, a platform that Henry Clay labeled “The American System.” This paper will focus on the third plank, the idea that because of pervasive free-rider problems, it was supposedly necessary for the taxpayers to subsidize the building of roads, canals, and railroads. History shows that while governments did subsidize such “internal improvements,” most of them during the first half of the nineteenth century were privately financed. Moreover, in virtually every single instance where governments intervened to build roads, canals, and railroads during this period the result was corruption and financial debacle. It was because of such debacles that dozens of states eventually amended their constitutions to prevent taxpayer subsidies for internal improvements.

PROponents OF “INTERNAL IMPROVEMENT” SUBSIDIES

There were many prominent proponents of government subsidies for internal improvements during the first half of the nineteenth century. This section will briefly outline the views of a few of the most prominent figures whose views shaped the debate for several decades.

George Washington’s Secretary of the Treasury, Alexander Hamilton, first promoted the idea of subsidies for “internal improvements” or corporate welfare in his famous 1791 *Report on Manufactures*. In what might be viewed as an early statement of the theory of the free-rider problem Hamilton wrote: “[T]he public purse must supply the deficiency of private resource. In what can it be so useful, as in prompting and improving the efforts of industry?”¹

But it was Thomas Jefferson's Treasury Secretary, Albert Gallatin, who presented a detailed proposal for the taxpayer funding of internal improvements that came to be known as the "Gallatin plan." Presented to Congress in 1806, Gallatin's *Report on Roads and Canals* was "the earliest and most distinguished attempt to formulate a comprehensive national plan of internal improvements," writes economic historian Carter Goodrich.² Gallatin's report declared that "The General Government can alone remove these obstacles" to transportation and "the early and efficient aid of the *Federal* government is recommended"(emphasis in original).³ This statement was Gallatin's version of the free-rider argument coupled with a good example of an oxymoron: "efficient aid" of the federal government. He advocated a ten-year central plan for government-financed and supervised canal and road building.

Gallatin advocated federal subsidies because he claimed there was a "scarcity of private capital" because the prospects for profitable roads and canals were supposedly "remote."⁴ He favored a vast, federally-subsidized system of canals that would assure "protection against storms and enemies."⁵ Very little came of his proposal, however, because of constitutional issues raised by Jefferson and others.

John Quincy Adams was perhaps the second most prominent advocate of taxpayer subsidies for canal- and road-building companies. In a private letter after he left the presidency Adams opined that "The great effort of my administration was to mature into a permanent and regular system the application of all the superfluous revenue of the Union to internal improvement . . . with this system . . . the surface of the whole nation would have been checkered over with Rail roads and Canals . . ."⁶ In the letter a bitter Adams bemoaned the fact that this gigantic pork barrel project was foiled by James Monroe, who had persuasively

made constitutional arguments against such expenditures, arguments that Adams blamed on “Jefferson’s blighting breath.”⁷ Calhoun, whom Adams called “the Sable Genius of the South,” also played a prominent role in foiling his plans. “The great object of my life therefore as applied to the administration of the Government,” Adams complained, had “*failed*” (emphasis in original).⁸

Henry Clay, the leader of the Whig party, championed the Hamilton/Gallatin/Adams cause from the 1820s until his death in 1852 under the rubric of “The American System.”⁹ By 1837 the Whig party had achieved a great deal of success in state governments throughout the nation and used their political power to commence hundreds of government-subsidized canal- and road-building projects. As will be discussed below, these projects were almost uniformly disastrous and led to the virtual bankruptcy of several states, including Illinois, where a young Abraham Lincoln was the leader of the Whigs.

THE OPPONENTS OF “INTERNAL IMPROVEMENT” SUBSIDIES

Protectionist tariffs were advocated by all the proponents of government-subsidized internal improvements, for tariff revenues were to be the means of financing the projects. Thus, when John Quincy Adams sarcastically called John C. Calhoun the “Sable genius of the South,” he was expressing his bitter disappointment over Calhoun’s having succeeded in getting South Carolina to nullify the 1828 Tariff of Abominations. Adams condemned Calhoun for having “fell to cursing the tariff, and internal improvement’ and for having “raised the Standard of Free Trade, Nullification, and States Rights.”¹⁰

But it was James Madison, the “father” of the Constitution, who made the most powerful argument against using tax dollars to subsidize private corporations engaged in road and canal building. Given Madison’s prominence as an architect of the Constitution, his opinion on the matter was influential for many years.

Madison’s very last act as president was to veto an internal improvements bill sponsored by Henry Clay. Clay had seen to it that the rechartering of the Bank of the United States in 1816 left a \$1.5 million slush fund to be used for internal improvement subsidies. Madison had previously warned that such expenditures were unconstitutional and said that a constitutional amendment would be necessary in order for the federal government to spend money on such purposes. Clay attempted to sneak his bill past the lame duck president, who reportedly learned of the bill in the newspapers. So on his very last day in office President James Madison

[D]ecided it was time to teach the nation a lesson in constitutionalism. . . . The . . . bill, he said, failed to take into account the fact that Congress had enumerated powers under section eight of the first article of the Constitution, ‘and it does not appear that the power proposed to be exercised in the bill is among the enumerated powers, or that it falls by any just interpretation within the power to make the laws necessary and proper’ for carrying other constitutional powers into execution.¹¹

Madison warned Congress that the General Welfare Clause of the Constitution was never intended to become a Pandora’s box for special-interest legislation.

Some sixteen years later Andrew Jackson vetoed numerous internal improvement bills, much to the consternation of Henry Clay, their principal sponsor. Jackson referred to such subsidies as “saddling upon the government the losses of unsuccessful private speculation” and,

in his Farewell Address, boasted that he had “finally overthrown . . . this plan of unconstitutional expenditure for the purpose of corrupt influence.”¹²

In a sense, the momentous nineteenth century debates over protectionism and central banking were rooted in the controversy over internal improvement subsidies. A primary reason the proponents of protectionism and central banking gave for their plans was the need to raise money to pay for such things as Gallatin’s ten-year central plan to “criss-cross the nation” with canals and government-financed roads.

THE IMPORTANCE OF THE FREE-RIDER PROBLEM

The key argument in favor of government subsidies for the building of canals and roads, as discussed above, was the free-rider problem. The “free rider” language wasn’t used, of course, but the ideas put forth were essentially the same: the alleged lack of private capital, the “necessity” for government to intervene if anything was to be accomplished, etc. But Daniel Klein has shown that, regardless of the popularity of the free-rider theory, privately-funded roads (called “turnpikes”) proliferated during the first forty years of the nineteenth century.¹³ If government had a role, it was to reduce or eliminate the taxes and regulations imposed on the “turnpike companies,” not to subsidize them with tax dollars.

As early as 1800, before the internal improvements debate even commenced, there were sixty-nine private road-building companies that were chartered by the states.¹⁴

In the next three decades, writes Klein,

The [private road-building] movement built new roads at rates previously unheard of in America. Over \$11 million was invested in turnpikes in New York, some \$6.5 million in New England, and over \$4.5 million in

Pennsylvania. . . . Between 1794 and 1840, 238 private New England turnpike companies built and operated about 3,750 miles of road. New York led all other states in turnpike mileage with over 4,000 as of 1821. Pennsylvania was second, reaching a peak of about 2,400 miles in 1832. New Jersey companies operated 50 miles by 1821 . . . [B]etween 1810 and 1845 over 400 [private] turnpikes were chartered and built . . .¹⁵

Even though owning stock in a turnpike company in the early nineteenth century promised a meager return of only 3 percent or less annually, it was widely understood at the time that there were additional economic benefits that would accrue to such investments. Local merchants had strong incentives to invest in private turnpikes because they would bring more commerce to their towns. Landowners would see their property values rise, and cities would more generally prosper as improved transportation extended the division of labor and the economic benefits derived from it.

It was understood that the building of roads would encourage settlement and expand the size of markets for merchants' goods. As one Benjamin De Witt wrote in 1807: "Turnpikes encourage settlements, open new channels for the transportation of produce and merchandise, increase the products of agriculture, and facilitate every species of internal commerce."¹⁶

Klein points out that the shares in the turnpike companies were almost invariably owned locally, which supports the notion that local merchants, landowners, and citizens in general fully understood that there were additional benefits to investing in turnpike companies aside from the mere return on their investment in those companies. Businessmen in larger cities also invested because they wanted to encourage the development of markets for their goods. At least one state -- Connecticut -- exempted turnpike company stock from taxation.¹⁷

This was an era that preceded the federal takeover and domination of the states that occurred during and after the War for Southern Independence of 1861-1865. The spirit of voluntary association was not yet snuffed out by the great centralization of governmental power that occurred in the post-war years. As Tocqueville famously remarked in 1840: “Americans. . . constantly form associations. They have not only commercial and manufacturing companies, in which all take part, but associations of a thousand other kinds. . .”¹⁸

Nineteenth-century Americans used social pressure to encourage people to invest in the roads which they would all benefit from. Town meetings were an important vehicle in this regard, as were newspapers. Most adult Americans of the time were avid newspaper readers, and it was typical of the advocates of road-building projects to make their case to the entire community in the newspaper.

A sort of privatized “law” of eminent domain existed whereby rights of way were paid for not so much with cash but with shares of stock in the turnpike companies. Thus, there was no coercive “taking” of private property with supposedly “just compensation” as defined by only one party, the state. The value of property used as a right of way was negotiated and free-market exchange, not land confiscation by the state, was utilized, in sharp contrast to what occurred in the latter half of the century with the building of government-subsidized transcontinental railroads.

THE POLITICAL ECONOMY OF CORPORATE WELFARE

The political opponents of government subsidies for canal- and road-building companies understood that such subsidies would inevitably lead to corruption and that any projects built

with taxpayer dollars would be guided more by political than economic criteria. Calhoun, for example, protested that the tariff, which was disproportionately paid by trade-dependent southerners, would be primarily used to finance road and canal projects in the northern states. The tariff was thus an instrument of plunder, and he wanted no part of it.

In contrast, when private investors financed the roads, they did everything in their power to assure that the roads were built as economically as possible. This never guarantees “efficiency” -- indeed, there were many bankruptcies in the early nineteenth century -- but the proper incentives are in place: efficient road building would reward investors with profits; inefficient operations would result in losses or bankruptcy. No such incentives can exist with government financing.

With government financing politics inevitably takes the place of economics as the main decision-making criteria. Legislators will insist, as a condition of voting for the subsidies, that roads be built near where they live or in the vicinity of their major contributors, even if it would be uneconomical to do so. For example, during the congressional debates over federal subsidies for transcontinental railroads in 1862 a New Mexico congressman complained that “the wrangle of local interests” was such that many members of Congress would not support the subsidy bill unless the transcontinental railroad “starts in the corner of every man’s farm and runs through all his neighbors’ plantations” in every congressional district.¹⁹

All politicians also have an irresistible penchant for micromanaging any government-funded project, and the way in which they micromanage the projects is through regulation. Thus, government-financed projects are inevitably mired in red tape and counterproductive regulations. As Mises wrote: “Bureaucratic conduct of affairs is conduct bound to comply with

detailed rules and regulations fixed by the authority of a superior body. . . [It] is the social apparatus of coercion and compulsion. . .”²⁰

In private competitive markets investments in businesses are “directed” by the wishes of consumers. If roads are built that too few consumers prefer to travel, then the profits of the road-building company will decline. This creates a powerful incentive not to overinvest.

With government-subsidized roads, however, the criteria for investments are entirely different. The whims of politicians and bureaucrats replace consumer sovereignty as the deciding criterion. Moreover, in government there is no way of knowing whether the not the subsidies were “profitable” investments, since it is not possible to objectively measure the opportunity cost of those resources, i.e., what taxpayers might have otherwise done with those funds. Government agencies do not have profit-and-loss statements, in an accounting sense, so there is no way of knowing whether their expenditures ultimately create or destroy value.

In government bureaucracies wise decisions are not rewarded by profits, since there are no profits, nor are they penalized by losses. Indeed, as a rule, failure is success in government. The worse a government agency performs in accomplishing its purported task (i.e., subsidizing road construction) the *more* funding it will likely get next year.

Recognizing these economic laws of politics and bureaucracy strengthens the case for privatized road building by revealing the underlying inefficiencies of government-subsidized road building. Dozens of states learned these lessons first hand during the first half of the nineteenth century.

THE FAILURE OF GOVERNMENT-FINANCED

“INTERNAL IMPROVEMENT” PROGRAMS

By 1840 the railroad had eclipsed canals as the center of the internal improvements debate. Many states subsidized canals and railroads during the late 1830s and later but, as will be discussed below, the subsidies usually turned out to be disastrous.

Ohio was one of the most active states with regard to granting subsidies for internal improvements. But as Carter Goodrich wrote, “In Ohio, as in other states, revulsion followed the early enthusiasm” for government subsidies.²¹ There was so much waste and corruption that Ohio “stood as one of the chief examples of the revulsion of feeling against governmental promotion of internal improvement.”²² In 1851 the state amended its constitution to prohibit both state and local government subsidies to private companies.²³

Indiana, Illinois, and Michigan were even less successful with their subsidy programs, enacted in 1836 and 1837. In three short years the subsidized canal, road, and railroad projects were all bankrupt and unfinished. By 1840 each of these states also amended their constitutions to prohibit state subsidies for internal improvements.²⁴

The most powerful proponent of subsidies for internal improvements in the Illinois state legislature was Abraham Lincoln, who was the leader of the Whig party in Illinois at the time (and later to become the general counsel of the Illinois Central Railroad). The program that was enacted under his supervision was considered to be a “model” of the Henry Clay/Whig “American System” but in reality it was a wildly irresponsible squandering of millions of taxpayers’ dollars.

Lincoln and the Whigs controlled the Illinois state house and got exactly the kind of bill they wanted. As Carter Goodrich described it, the 1837 bill

had . . . something for everyone: improvements for five rivers; east-west railroads across the state, with various branches; and a great central railroad to extend from the northwestern corner to the southern tip of the state. In addition . . . the act appropriated \$200,000 for improvements in counties which did not share in the specific appropriations. The total expenditure authorized was \$10,500,000, and the legislature prescribed that work should commence simultaneously on all the projects. . . . The next legislature added . . . \$1,000,000.²⁵

William Herndon, Abraham Lincoln's law partner, marveled over what a spectacular boondoggle the plan was:

Every river and stream . . . was to be widened, deepened, and made navigable. A canal to connect the Illinois River and Lake Michigan was to be dug . . . cities were to spring up everywhere; capital from abroad was to come pouring in . . . people were to come swarming in by colonies, until . . . Illinois was to . . . become the Empire State of the Union.²⁶

But the project was a disaster. In Herndon's words, it was

reckless and unwise. The gigantic and stupendous operations of the scheme dazzled the eyes of nearly everybody, but in the end it rolled up a debt so enormous as to impede the otherwise marvelous progress of Illinois. The burdens imposed by this Legislature under the guise of improvements became so monumental in size it is little wonder that at intervals for years after the monster of [debt] repudiation often showed its hideous face above the waves of popular indignation.²⁷

George Nicolay and John Hay, Lincoln's former law clerks and his personal secretaries in the White House, added that "the market was glutted with Illinois bonds; one banker and one broker after another, to whose hands they had been recklessly confided in New York and

London, failed, or made away with the proceeds . . . the internal improvements system had utterly failed; there was nothing to do but repeal it . . .²⁸

Most of the projects were abandoned before completion; only a part of one railroad was completed and then sold for a fraction of its cost. A new state constitution, adopted in 1848, prohibited state aid to private companies.²⁹ Chicago went on to become the nation's greatest railroad center without the dubious benefit of any state or city tax funds.

In 1837 Michigan began subsidizing private railroad companies but the projects quickly exhibited the familiar characteristics of mismanagement, corruption, and massive cost overruns. The state sold the Michigan Central and Michigan Southern Railroads for less than half of what it had spent on them. "The state's venture in internal improvements was so universally regarded as a failure that prohibitions against both public works and mixed enterprise were voted almost without discussion for inclusion in the constitution of 1850."³⁰

Government subsidies for internal improvements in the 1830s were a complete, total, financial disaster. As described by historian John Bach McMaster: "In *every* state which had gone recklessly into internal improvements the financial situation was alarming. *No* works were finished; little or no income was derived from them; interest on the bonds increased day by day and no means of paying it save by taxation remained (emphasis added)."³¹

Wisconsin and Minnesota learned valuable lessons from the above-mentioned states. When they entered the union in 1848 and 1857 respectively their constitutions forbade both grants and loans to private companies.³² In Iowa the state courts even held that local aid to private companies was unconstitutional.³³ Louisiana began subsidizing railroads before Illinois

and most other states (1833) and, consequently, was one of the first states to turn around and forbid state aid for internal improvements (1845).³⁴

By 1861 state subsidies for internal improvements were forbidden by constitutional amendment in Maine, New York, Pennsylvania, Maryland, Minnesota, Iowa, Kentucky, Kansas, California, and Oregon. West Virginia, Nevada, and Nebraska entered the union in the 1860s with similar prohibitions. Missouri and Massachusetts were the only two states where the law sanctioned state subsidies for internal improvements, and Missouri amended its constitution to prohibit them in 1875.³⁵

INTERNAL IMPROVEMENTS AT THE BARREL OF A GUN

By 1861, on the eve of the War for Southern Independence, the internal improvements debate had been effectively decided: Government subsidies for private transportation were not necessary, and when they were used the result was disaster after disaster. So disastrous were they that numerous states not only enacted legislation but amended their constitutions to prohibit them. Theory, evidence, and experience had shown the wisdom of privatized transportation and the folly of government subsidies.

The southern states were less active in subsidizing transportation than were the northern states and, all during the first sixty years of the nineteenth century it was southern statesmen who were “the most consistent opponents of federal aid.”³⁶ In fact, southerners were so opposed to federal subsidies for internal improvements that the Confederate Constitution of 1861 prohibited them (with a few minor exceptions). Article I, Section 8, Clause 3, stipulated that

the Congress shall have the power to regulate commerce with foreign

nations, and among the several States, and with Indian tribes; but neither this, nor any other clause contained in the Constitution, shall ever be construed to delegate power to the Congress to appropriate money for any internal improvement intended to facilitate commerce . . . ³⁷

The first part of this article is essentially identical to the Commerce Clause of the U.S. Constitution, with the important exception of adding the prohibition of internal improvement subsidies. An exception was made for “beacons, and buoys,” and the dredging of harbors. The southern states were permitted to use state tax revenues to subsidize internal improvements but, as discussed above, most states had also made this unconstitutional in their state constitutions as well.

There is a reason why most opponents of internal improvement subsidies were also opposed to protectionist tariffs and central banking, and vice versa: the proponents of internal improvement subsidies also tended to be in favor of protectionism and central banking. This was the Whig/Republican party agenda, and it was the agenda of America’s mercantilists. Henry Clay had fought ferociously for it for forty years, but with almost no success due to the efforts of Jefferson, Madison, James Monroe, Jackson and others. It was the Agenda of the young Republican party in 1861, led by the man who had admittedly devoted his entire twenty-eight year political career to achieving that agenda, Abraham Lincoln.³⁸ Indeed, Lincoln confessed to a friend early in his political career that his ambition was to become “the DeWitt Clinton of Illinois.”³⁹ Clinton was the governor of New York in the early nineteenth century who is credited with having invented the spoils system and convinced the government to subsidize the Erie Canal -- at a time when the invention of the railroad would quickly render such canals obsolete.

The Whig/Republican agenda was one of greatly centralizing governmental power in Washington with high protectionist tariffs and a central bank. The purpose of these revenue-raising vehicles was to “criss cross the nation” with corporate welfare. Internal improvement subsidies were one leg of this three-legged mercantilist stool.

Opposition to central banking was always strongest among southerners and the Confederate Constitution also outlawed the only other source of revenue for federal internal improvement subsidies, protectionist tariffs. Article I, Section 8, Clause 1 stipulated that “no bounties shall be granted from the Treasury; nor shall any duties or taxes on importations from foreign nations be laid to promote or foster any branch of industry.”⁴⁰

The tariff was the keystone of the Republican party platform of 1861, for it promised to be an immediate source of funds for internal improvement schemes, such as a series of transcontinental railroads. In his First Inaugural Address Lincoln assured everyone over and over that he had no intention to disturb southern slavery and, even if he did, there would be no constitutional basis for it. But if tariffs were not collected, he promised an invasion and, of course, he kept his promise.

When the southern states seceded there was no longer any effective opposition to internal improvements, tariffs, and central banking, and all three were quickly adopted. So anxious were Northern mercantilists (i.e., the Republican party) to reap the fruits of their victory in the 60-year battle over corporate welfare that they began spending millions of tax dollars on a transcontinental railroad line *in California* in the first two years of the war, when Robert E. Lee’s Army of Northern Virginia was scoring victory after victory on the battlefield, and Washington, D.C. itself was seriously threatened with being captured and occupied by Lee’s

army. Lincoln was admittedly in a desperate state over the fact that the federal armies were clearly losing the war, but millions of dollars were nevertheless diverted from the war effort to railroad building *in California*.

The intellectual and philosophical debates over internal improvement subsidies may have been won by the opponents of the subsidies as of 1861, but the proponents ultimately prevailed in the policy “debate,” literally, by force of arms.

Railroad lobbyists descended on Washington with the advent of the Lincoln administration and their old friend, the former general counsel and lobbyist for the Illinois Central, made sure that his administration complied with their pork barrel requests. The federally-funded Union Pacific and Central Pacific Railroads were given sections of land for each mile of track completed; \$16,000 in low-interest loans for each mile of track on flat prairie land; \$32,000 for hilly terrain; and \$48,000 in the mountains.⁴¹

Since the subsidies were paid by the mile the companies built wastefully circuitous routes and collected more and more subsidies. They even built tracks on top of several feet of ice in the Rocky Mountains and then rebuilt them when the ice melted, pocketing even more subsidies. The cheapest construction materials were used and speed, not workmanship, was emphasized.⁴²

By the time the Union Pacific and Central Pacific railroads were completed in 1869, both companies were bankrupt. Bribery was so rampant during the Grant administrations that the vice president, Secretary of War, numerous Republican congressmen, Grant’s private secretary, his Treasury Secretary, and even the ambassador to England were all implicated in stock swindles or bribery related to the Credit Mobilier Company scandal.⁴³ As historian

Leonard Curry remarked, “the railway interests of the country . . . sustained and encouraged by federal funds, mushroomed into one of the most powerful and ruthless lobbies that the republic has ever known.”⁴⁴

During the period of “Reconstruction” (1865-1877) the federal government, which was synonymous with the Republican party, was responsible for extraordinary waste, fraud, and corruption related to railroad subsidies in the southern states, which at the time were governed by military “governors” appointed by the Republican party. Government bonds were typically sold before work began on railroads and “dishonest promoters sold these bonds for what they could get and never built the roads,” writes historian E. Merton Coulter.⁴⁵ “Railways that had been owned in whole or in part by the states were grossly mismanaged, and were exploited for the profit of politicians,” observed William Archibald Dunning, and “the progressive depletion of the public treasuries was accompanied by great prosperity among [Republican] politicians of high and low degree. . . . Bribery became the indispensable adjunct of legislation, and fraud a common feature in the execution of the laws.”⁴⁶ So-called Reconstruction came to be known as the “Era of Good Stealings.”⁴⁷

The advocates of government subsidies for transcontinental railroads made the argument that such railroads would never be financed by private capital markets. But railroad entrepreneur James J. Hill proved them wrong by building the Great Northern Railroad, which was by far the most efficiently built and most profitable of all the transcontinentals. “Our own line in the North,” Hill proudly boasted, “was built without any government aid, even the right of way, through hundreds of miles of public lands, being paid for in cash.”⁴⁸

The Mormons also built four railroads in Utah without any government subsidies, which also gives the lie to the notion that government subsidies were needed for railroad construction.⁴⁹

New Hampshire and Vermont gave no aid whatsoever to railroads, yet a privately-funded line was built across the rugged terrain of the two states. Unlike many other states, New Hampshire even refused to grant the right of eminent domain to private railroad companies and, in so doing, encouraged them to pay free-market prices for any rights of way.⁵⁰

CONCLUSIONS

A version of the free-rider problem emerged as early as 1800 during the debates over government subsidies for internal improvements, and was espoused by all proponents of subsidies. But even before that argument was crafted there were private road- and canal-building companies in the U.S. that thrived without government subsidies. Daniel Klein has shown that during the first forty years of the nineteenth century there were literally hundreds of privately-financed “turnpike” companies that were also thriving. There was no free-rider problem that the dynamic discovery process of the free market could not overcome during that era.

Governments at all levels did intervene, however, with subsidies for canals, roads, and railroads, and their record of performance was nothing less than monstrous. State subsidies to canals were made with great fanfare and promise but were such disastrous failures that nearly every state eventually amended its constitution to prohibit such subsidies.

To this day proponents of government subsidies for transportation point to the Erie Canal as one such project that “succeeded,” although they usually fail to point out that even though the canal operated successfully for fifteen years it quickly became defunct because of the invention of the railroad.

By 1861 every state had had such a miserable experience with government-subsidized canals, roads, and railroads that only Missouri and Massachusetts permitted such subsidies. That’s why the proponents of American mercantilism, embodied in the Republican party, turned to the federal government as the source of their largesse. The major opposition to federal subsidies had always come primarily from southerners, and with the southern states out of the union the way had been cleared for government-subsidized railroad construction which was characterized by an orgy of waste, fraud, corruption, and criminality.

Carter Goodrich remarked at the end of a book-length study of government promotion of canals and railroads that “it is difficult to imagine what the nation’s transportation system would have been on the eve of the Civil War if there had been no public subsidy.”⁵¹ Well, yes and no. It certainly would have been a more efficiently-built one, since in a free market it would be driven by the motivation to build in the most economical (and profitable) way and to serve the largest numbers of consumers. James J. Hill’s Great Northern could be an example of what such a system would have looked like. And if there would have been a smaller railroad infrastructure, so what? As Mises said, it is impossible to objectively judge the “efficiency” of such governmental enterprises because there is no way of knowing how all those tax dollars would have alternatively been spent. Government intervention always short-circuits the dynamic discovery process of the free market.

Even Goodrich acknowledges that after the initial subsidy madness of the post-war years the railroad industry was essentially privately financed thereafter. Without the subsidies all the bankruptcies, scandals, and waste would have been avoided and, if the industry would have developed a decade or two later than it did, it would have done so in a much less wasteful manner. Furthermore, the precedent would not have been established that virtually *any* industry could go to Washington and use the political process to plunder the taxpayers with corporate welfare schemes. It is exactly this system of plunder that the subsidy opponents, from James Madison to the designers of the Confederate Constitution, sought to avoid. In the end, this corrupt system was forced upon the nation at gunpoint.

FOOTNOTES

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Surface-Transportation Funding in a New Century: Assessing One Slice of the Federal Marble Cake

Sheldon Edner, Ph.D.

Team Leader

Office of Metropolitan Planning and Programs

Federal Highway Administration

400 Seventh Street SW

Washington, DC 20590

(202) 366-4066; (202) 366-7660 (fax); sheldon.edner@fhwa.dot.gov

and

Bruce D. McDowell, Ph.D., AICP

President

Intergovernmental Management Associates

10408 Gainsborough Road

Potomac, MD 20854-4042

202/347-3190; 202/393-0993 (fax); bmcowell@napawash.org

Abstract

The state of American federalism is a matter of perennial discussion. This article examines federalism through the prism of the surface transportation program; one of the nation's largest grant-in-aid programs. No matter how pragmatic or intense our desire to express assessments in simple terms, the reality is that federalism is a time sensitive reflection of our collective experiential understanding. Facts, values, hypotheses and concepts are derived from this collective understanding. The experience of the surface transportation program under ISTEA and TEA-21 (its two most recent authorizations) illustrates the challenge of achieving a clear picture of where we are when radical changes occur. ISTEA and TEA-21 have significantly altered traditional intergovernmental relationships, particularly as the federal role in transportation appears to have become more ambiguous than at any time in the past 45 years. This article examines actual changes in relation to perceptions of those changes. At the outset of the

21st Century, the federal role in transportation is shifting, becoming far less focused.

Other goals are emerging, leading the federal transportation role to become more of a means to an end than the central focal point.

Surface-Transportation Funding in a New Century: Assessing A Slice of the Federal Marble Cake

In the past two decades, American federalism has been anything but static. Efforts at reform have been many; taking the pulse of the system has been difficult. Contending political agendas in and between the Administration and Congress have wrought significant changes in the character and directionality of federalism. Presidents Jimmy Carter, Ronald Reagan, George Bush and Bill Clinton each sought reforms to simplify intergovernmental relationships and return some responsibilities to the states, but these efforts remain a work in progress. Coupled with continuing crosscurrents in congressional actions, these presidential efforts have combined to further stir the batter in America's marble cake federalism. The outcomes have been hard to characterize with clarity. Transportation is one of the policy areas that has been a bellwether in characterizing the status of the Federal-state relationship.

With roots that reach back to 1916, the U.S. Department of Transportation (DOT) surface transportation program is among the most widely touted but most misunderstood grant-in-aid programs. It is a composite of several different forms of grants, including categorical, formula, discretionary, and competitive programs. The current program is authorized currently at roughly \$218 billion, spread over six years. It is slated for reauthorization in FY 2004. Primary responsibility for its implementation rests jointly with the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA).

The last two reauthorizations of the program -- the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21) -- have both been identified as environmentally supportive infrastructure enhancement programs. For some observers, the provisions in these acts that support flexibility and transferability of highway and transit funds are consistent with a continuing devolution of federal responsibility to state and local decision-makers. For others, the continuation of multiple categorical grants – such as the bridge program, the Congestion Mitigation and Air Quality program (CMAQ), and the National Highway System (NHS) -- reflects the continuation of centralized, yet balkanized programs aimed at supporting key interest-group priorities. Decentralization of program responsibility through devolution of certain decisions to local officials who agree to work together in metropolitan planning organizations (MPOs) is combined with continuing national and state responsibility for ensuring the implementation of the Clean Air, Americans with Disabilities, National Environmental Policy, and Civil Rights acts. This combination supports competing claims and counterclaims that there has been both grant reform and a shoring up of the status quo in federal control. In this complex setting, many misunderstandings about the structure and implementation of the surface transportation program have flourished.

The purpose of this article is to articulate more clearly how the surface-transportation program is structured and implemented. An examination of how the program has changed over the past decade reveals significant departures from traditional intergovernmental relationships. It also helps to explain how shifting political forces

have created greater ambiguity in the federal system and to set the stage for considering the future federal role.

HISTORICAL CONTEXT OF THE FEDERAL SURFACE-TRANSPORTATION PROGRAM

The history of the federal highway program originated more than 100 years ago with the creation of the Office of Road Inquiry in the US Department of Agriculture (USDA). Its director, General Roy Stone, used this small office during his eight-year tenure to foster the development of the “Good Roads Movement.” In 1916, the Federal-Aid Highway Program was created in the USDA with an initial formula-allocation program based on post-road mileage, total state area, and total state mileage. The federal government’s share of cost was 50 percent per mile up to \$10,000. As the program developed, it moved to the Department of Commerce where the Bureau of Public Roads administered it.

The real acceleration of federal transportation investment came in 1956 with the creation of the Interstate Highway System, the Highway Trust Fund, and an authorization of more than \$25 billion for the period 1957-1969.¹ Since its inception, the federal-aid highway program has emphasized dedicated funding and formula distribution of monies to the States based on a clear national transportation purpose (e.g., economic development, mobility, national defense, connectivity, and technological innovation). Since the mid-1950s, the focus has included a national interest in supporting state and local program efforts.

The FTA was created much more recently and reflects the emerging responsibility of the federal government in urban issues. The federal government's first mass transportation effort at the federal level was the Housing Act of 1961. This act created a small, low-interest loan program in the Housing and Home Finance Agency (the predecessor of the U.S. Department of Housing and Urban Development (HUD)). This program provided federal-aid for acquisitions and capital improvements for mass-transit systems; basically it helped local governments to buy out failing private transit agencies. This initiative was followed in 1964 by the Urban Mass Transportation Act, which was designed to encourage the establishment of area-wide urban mass-transportation systems. The Act provided grants for up to two-thirds of project cost for acquisition of mass transportation facilities and equipment. It emphasized urban planning and locally initiated project identification. Authorizations were at \$164 million annually, but actual appropriations often fell significantly below this level.² A nickel gas-tax increase during the Reagan administration, and the ISTEA and TEA-21 reauthorization efforts in the 1990s, created the first permanent funding stream for FTA from the highway trust fund. TEA-21 later protected this funding with budgetary "firewalls".

The federal-aid highway and transit programs were brought together in the U. S. Department of Transportation when it was created in 1966. Today the legacy of separately created programs continues to challenge an integrated federal approach to transportation; leading several Secretaries' of transportation in search of means to encourage "one-DOT" approaches to surface transportation.

In the American context, grants-in-aid programs have had a positive political history for many reasons, including, among others, stimulating innovation, avoiding direct federal program responsibility, providing flexibility, allowing mergers of federal and recipient agendas, and providing a conduit for other policy agenda items (cross-cutting policies). For the surface transportation program, highways have relied on a federal/state grant-in-aid relationship based on the need to stimulate investment while avoiding federal decision-making or programs. The hallmark of the highway program has been leveraging the federal capacity to raise revenue in pursuit of broad national policy goals, such as economic development, military defense, connectivity, and support for technological development, as implemented through projects identified at the state and local levels.

The transit effort has been more limited in scope. A product of the growing federal intervention in “urban” issues, it has reflected a more targeted interest in supporting livable communities and vibrant metropolitan areas. It has often had to compete at the national, state and local levels with localized priorities for education, public works, and social services. Until 1991, when the transit program received permanent funding from the highway trust fund, the program was perceived as a targeted grant-in-aid effort to support larger metropolitan areas with alternative transportation services for travelers without access to automobiles. Starting initially as a bailout effort to ease the demise of private transit providers, the transit program gradually shifted to a maintenance-of-effort and technology-innovation program in support of system operation and the provision of capital for the creation of new mass transportation systems. The

FTA's large grant awards for new systems and formula allocations for capital and operating assistance keep it close to the churning debate about whether the federal government should have an aggressive urban policy. As an interventionist, targeted, supplemental support effort, the transit program has been tossed around by the vagaries of politics far more than its highway counterpart. It has lacked both the clear national support base and policy direction consensus that has underpinned the more popular and universally used highway program.

For both highways and transit, there have been efforts to utilize program-funding streams to leverage other policy activities. Transit has been tied to housing, labor, welfare, environment, and related federal initiatives, and has been extended even to rural transportation alternatives in recent years. Highways have carried economic development, commerce, environmental protection, defense, and technological initiatives. The mixed success of these concurrent policy goals has often reflected the presence or absence of robust support systems. Examples of the mixed experience are reflected in the welfare connection for transit and the environmental connection for highways.

For transit, the transportation-disadvantaged populations are a perceived natural constituency for bus, van, and taxi systems. Unfortunately, these potential patrons are also the least able to afford transit (or lobby for it), and they often abandon it when they can afford an automobile. Moreover, transit operators are prone to plan service for middle-income commuters who represent a larger market share more able and willing to pay significant transit fares.

In the case of highways, the federal program has provided substantial environmental funding, although it often has been piecemeal and inconsistent over large geographic areas. Support for increased highway travel is not positively connected with air-quality improvement. Thus, transportation funding has had mixed agendas and mixed success over the last decade in leveraging its increasing funds for social and environmental purposes. The result is increasing ambiguity in the goals of the surface transportation programs.

HIGHWAY AND TRANSIT GRANT PROGRAMS: THE MULTIPLE PERSONALITIES OF SURFACE TRANSPORTATION

The FTA and FHWA share responsibility for administering the surface transportation program. TEA-21 reauthorized this combination of several disparate grant programs at \$218 billion over six years (FY 1998 – 2003). This reauthorization amended two separate sections of Public Law: (1) Title 23 of the United States Code (USC), which authorizes the highway and multimodal programs, and (2) Title 49, Chapter 53 USC which authorizes the transit programs. The FHWA administers the bulk of the surface-transportation program funds under five core program categories: Interstate Maintenance (IM), National Highway System (NHS), Highway Bridge Replacement and Rehabilitation (Bridge), Surface Transportation Program (STP), and CMAQ. In addition, the FHWA administers several other small grant programs targeted at a range of narrow recipient groups.

The FTA's much more modest share of the funding is approximately \$41 billion. Two FTA program categories account for almost 90 percent of the FTA's funding:

formula grants and discretionary capital grants. The formula category is allocated between two types of recipients--transit agencies and states. The discretionary capital investment program supports three categorical areas: bus and bus related facilities, fixed guideway³ modernization, and new fixed guideway systems (“new starts”). Formula grants are approximately 60 percent of all FTA funds, but the new-starts program tends to attract extensive attention because the funding concentrates on a small number of recipients that are initiating major new systems through these large individual grant awards.

The highway and transit programs are both funded from the highway trust fund and general funds. However, the bulk of the guaranteed funding for both the FTA and FHWA is trust fund monies. The FTA receives about 20 percent of its annual program funding from guaranteed general funds. The significance of this difference is that the transit program must compete directly for remaining authorized general funds. Under the “firewall” provisions of TEA-21, trust funds are mandated for expenditure at the levels authorized, while additional non-guaranteed monies from general funds are subject to annual appropriations. Highway funds (and most FTA funds) are “contract authority,” which is distributed of the first day of the federal fiscal year, subject to annual spending limit (i.e., obligation authority).⁴ Apportioned annually by formula, these funds are typically available for a period of four years before they lapse. Consequently, they represent a very reliable and predictable source of funding for state and regional transportation programs. As an example, in the midst of the Clinton/congressional

budget stand-offs that led to shut downs and personnel furloughs, the FHWA and the FTA both stayed open for business, and funds continued to flow to the states.

The traditional FHWA characterization of the federal-aid highway program is a “federally assisted state and local program.” Responsibility for identifying and advancing projects rests with the state departments of transportation (SDOTs) and their transportation partners, not with the federal government (except for certain congressionally earmarked projects). While federal project oversight has been substantial in the past, program administration has changed significantly as the states have “exempted” the FHWA from project oversight in substantial parts of the program.⁵ An example is the STP where a full exemption can mean the submission by a SDOT of a quarterly listing of projects funded with STP funds. All oversight is conducted by the SDOT if it self-certifies compliance with appropriate federal requirements. FHWA staff has focused increasingly on program management, reducing its direct project oversight to major projects having significant costs or potential environmental impacts.

A new approach to highway program management is emerging for the FHWA in the context of the global economy. ISTEA established the importance of freight movement as a transportation focus. During the ISTEA years, the North American Free Trade Agreement (NAFTA) set an international context for freight movement, which was recognized more formally in TEA-21 through “NAFTA highways” and a new borders and corridors program. The emphasis on international economic competitiveness is

slowly moving the FHWA away from a traditional infrastructure focus to a more macro international role in economic activity.

The FTA's increasing use of formula funding also is bringing new approaches to managing the transit program. This program now operates similar to the highway program, making quarterly grant awards to support overall programs of eligible recipients (which are generally local transit operators and state transportation agencies). Two major exceptions to this consolidated approach are the big-ticket new starts and rail modernization programs. In the latter case, funding is restricted to transit operators in metropolitan areas that already have existing rail systems. The new starts program provides capital assistance for bus and rail system expansion, including grants to operators in metropolitan areas that do not have existing transit systems of the type to be funded (i.e., transit operators of bus systems that seek to add light rail). While states have "exempted" the FHWA from project oversight of STP funds in many cases, the FTA continues to conduct extensive project and financial oversight of new start projects.

The new starts program authorizes the U.S. DOT secretary to award funds to transit operators serving metropolitan areas (and occasional rural exceptions like Glenwood Springs, Colorado), based on a congressional selection process that begins with competitive FTA ratings that evaluates all pending candidate projects. The FTA ratings are made twice a year and reported to Congress. Congress identified 191 candidate new starts in TEA-21, constituting the primary pool of projects to be rated by the FTA. The criteria for rating are stipulated in legislation and regulation. The source

of data for rating the projects is the metropolitan planning processes for the areas in which the projects are located.

On the highway side of the program, all funds are administered by the SDOT, which is directly accountable to the FHWA for their use. The FHWA does not make any money available directly to MPOs or to local governments for the construction of projects. Rather, their funds are taken from annual apportionments to states and are utilized either directly by the state to do work in metropolitan areas or, under state subcontract, to MPOs, cities, counties, and other sub-state entities. The SDOT is responsible to the federal government for administering these funds. Even the planning funds for MPOs are administered by the SDOTs. The MPOs and project sponsors are accountable to the SDOTs for the use of funds. The SDOTs, in turn, are accountable to the FHWA for program management.

The FTA's formula apportioned funds also bypass the MPOs, going directly to local and state transit operators or to the SDOT. FTA new start and rail modernization funds are granted through individual grant agreements negotiated between the federal government and the fund recipient. The recipients are typically, but not always, transit service providers who will operate the completed project. The administrative mechanism for committing funds is a Full Funding Grant Agreement (FFGA), which is signed by the U.S. DOT after congressional vetting. It is common for Congress to direct negotiation and completion of an FFGA as part of an appropriations bill.

ISTEA/TEA-21 IMPACTS: MYTHS AND REALITIES IN METROPOLITAN PLANNING

Both ISTEA and TEA-21 have been perceived as providing substantial new authority to local officials in metropolitan areas who have agreed to work together in MPOs. Although this perception is true with respect to making some planning and project selection decisions, there has been no change in how funds are administered or awarded. The funding for highways still flows directly to the SDOTs, which manage it and ensure its commitment. The majority of the FTA's formula funds continue to flow, as before, directly to transit operators, although there is an increasing tendency for the FTA to disburse funds directly to the state (e.g., funds under 49 USC 5310, 5311 and 9 percent of the funds under 49 USC 5307). For example, ISTEA directed all metropolitan planning funds to flow to the state instead of directly to MPOs. Most recently, the Bush administration's FY 2002 budget proposals would direct additional funding to the states (e.g., the discretionary bus program). On the FTA capital side, there has been no change in handling of capital funds (except that the rating process is new under TEA-21). However, all FTA formula funds for planning are now administered by state DOTs.

Although the planning roles of MPOs in metropolitan areas with urbanized area populations of 200,000 or more have been strengthened (which are designated Transportation Management Areas (TMA)), those MPOs still do not receive direct funding for the construction of facilities, except in rare cases.⁶ Consequently, MPOs really must rely on others to implement their priorities. Furthermore, because MPOs do

not raise money for funding purposes, their fiscal planning is really a matter of integrating others' plans for producing revenues.

The shift in MPO role can be more fully understood by examining the “condition of aid” nature of the surface-transportation program. Although MPOs were not given direct authority over the administration of funds, those MPOs that include TMAs⁷ are given the authority to identify projects for which STP “attributable funds” will be utilized. These formula funds authorized under 23 USC 133 are identified for use in TMAs, based on the area’s share of overall TMA population within the state. Each MPO, which includes a TMA, has the ability to decide how these formula funds will be used within its planning area boundary. The allocation process is accomplished simply by identifying the projects within the MPO plan as being funded from the funds attributable to the TMA. The SDOT then supports the project from these funds when it is advanced to implementation.

More broadly, a project cannot be supported with federal-aid funds unless it is included in a metropolitan transportation plan and program (TIP) and also in an approved state Transportation Improvement Program (STIP). Metropolitan plans, by statute, must be project specific and address a twenty-year planning horizon for the area. They also must be “fiscally constrained” (limited) to those projects for which funds can be identified to be “reasonably available.” It is this fiscal constraint component that has given the MPO planning process more “clout” in the decision making for transportation investments. Failure to include a project in a plan means that it cannot be implemented with federal funds. In addition, projects cannot be included if they cannot be funded with

dollars that are “reasonably expected to be available”. Therefore, many projects that once would have been included in plans cannot be included today. The decision to include a project is a product of negotiations between the participants in the MPO planning process. Sponsors of excluded projects are prevented from seeking implementation.

However, it has been argued that the SDOT often has the upper hand in project funding negotiations with MPOs, because it can reallocate monies to other parts of the state (with the exception of a relatively small amount of attributable funding). At the same time, projects of significant interest to states and transit operators cannot proceed until included in an MPO plan, so the MPOs may have some significant leverage in the negotiations.

The institutional integrity of the MPO is a major factor in the effectiveness of this federally defined decision-making process. There is a common perception that MPOs are independent entities with institutional autonomy and clout comparable to cities and counties when they deal with the states. Practically speaking, however, this is seldom true. The MPOs were created largely as a condition of federal aid, and they have only the powers granted to them under state statutes or other sources of their charters. The metropolitan planning process requirement was created in the early 1960s but was predominantly the responsibility of the states with participation from local officials. Designation of MPOs was required for the first time in the early 1970s. The MPO was to serve as a “forum,” charged with developing a metropolitan consensus on transportation

investments. Prior to ISTEA, however, transportation plans were not fiscally constrained. They could include (and usually did) many projects for which funding and implementation might never be achieved. So pre-ISTEA, MPOs did not have to make tough decisions to prioritize and exclude projects

By 1976, 82 percent of MPOs were councils of governments (COGs) or other multi-purpose regional planning commissions.⁸ However, reductions in non-transportation federal support for regionalism during the decade of the 1980s, and the creation of many small, new MPOs as a result of the 1980 and 1990 censuses, changed this situation. The most recent assessment of this issue by Bruce McDowell suggests that less than half the MPOs are COGs now.⁹ Indeed, several of the MPOs identified as COGs may not actually be a COG. As examples, consider Albuquerque and Washington D.C. In Albuquerque, the Middle Rio Grande Council of Governments (MRGCOG) serves the entire metropolitan area, including several relatively rural counties. The MPO policy board for the area is a subset (geographically and institutionally) of the policy board that develops a plan for a portion of the area served by MRGCOG. In Washington D.C., the Transportation Planning Board (a subset of the Metropolitan Washington Council of Governments) serves as the MPO for transportation planning purposes (and both operate under the umbrella of a nonprofit, nongovernmental corporate charter). In the State of New York, MPOs do not have corporate identity under state law and must be hosted by other governmental entities for the purposes of conducting business.

The diversity that exists largely reflects the individual authorizing statutes of each state. They also reflect the grandfathering of institutions created over time. Once established, it has been very difficult to generate momentum locally or nationally for institutional change in MPO structures. Hence, there has been little change in structural forms even where prompted by federal requirements (which have tended to be permissive rather than mandatory). A few examples of notable institutional strength do exist (typified by the San Francisco Bay Area Metropolitan Transportation Commission, an independent local government formed under state statute, and Portland, Oregon's METRO, which is also the product of state law and popular referendum). In general, however, MPOs do not have the functional and institutional strength of cities and counties and exist primarily to develop federally required transportation plans and financial implementation programs.

FOCUS OF SURFACE TRANSPORTATION: BALKANIZATION AS A MEANS OF SERVING MODAL INTERESTS

Transportation-system planning has reflected the creation and authorization of independent surface-transportation programs. The planning requirement for a "3C" (continuing, comprehensive, and cooperative) urban planning process stems from the 1962 Federal-aid Highway Act, which mandated an urban planning process in all urbanized areas. Initially, the Bureau of Public Roads (BPR-- precursor to the FHWA) required that the states and local communities do this cooperatively. The BPR required each urbanized area to form some entity to represent an entire urban area rather than separate local communities. The 1973 Federal-aid Highway Act, which added the formal requirement for an MPO, also provided highway-planning funds that were specifically

designated to go to the MPOs to support transportation planning. Although a set-aside for planning had existed previously in the federal-aid highway program, it was not required to go to the MPOs. The FTA began funding MPOs directly in 1969 to foster transit-related planning. With the passage of ISTEA, both FHWA (PL funds) and FTA (metropolitan planning funds) monies finally became eligible for planning for both modes. The primary emphasis in the law requiring designation of the MPO was on coordinating local decision-making rather than institution-building. From a federal perspective, developing an effective transportation planning process focused on the regional transportation system rather than on individual jurisdictional project priorities. The process sought to utilize techniques of transportation modeling that could provide an empirical basis for designing region-wide transportation systems rather than relying on local project advocacy.

Actions in the 1970s focused on regions and began multi-modal systems thinking to replace modal balkanization. Little institutional support for this existed at first, because the organizations involved in transportation decision-making were mission oriented transportation operating agencies (transit agencies and state DOTs) rather than on regional planning organizations. The program was still focused on building projects rather than on shaping regions and solving interrelated transportation problems. It took another 20 years of federal program evolution to lead to the ISTEA reforms that emphasize multi-modal transportation planning and decision-making, and provide flexible planning and capital grant funding to support the multi-modal approach.

This evolution began in 1978 when a multi-modal approach to transportation planning emerged in the transportation planning regulations developed and issued jointly by the Urban Mass Transportation Administration (UMTA was the predecessor of FTA) and the FHWA. However, implementation of the program remained with mode-specific operating agencies. Hence, while planning began to emphasize integration and system development, investments were still oriented to separate modal funding patterns. The decade of the 1980s did little to change this. Instead, it reinforced the traditional modal foci and de-emphasized regional planning initiatives. Indeed, the FTA's and FHWA's transportation funding for planning was one of the few federal regional programs to survive federal downsizing and devolution.¹⁰

The result was to continue a tradition of project emphasis rather than comprehensive planning and multi-modal problem solving. For many environmental critics of the federal transportation program, the weak link was “wish list” planning. The required plans, although comprehensive, carried no real implementation priorities. They were largely compilations of all known projects. States still determined which highway projects were funded, and transit operators determined which transit projects were funded. In the context of grant-in-aid implementation, the federal choice between oversight (promoting change) and keeping the money flowing is often made in favor of traditional, single-mode funding patterns.

ISTEA: REVOLUTION OR BLIP?

The extent of ISTEA's changes in the federal surface-transportation program, however, was often in the eye of the beholder. For example, in the context of metropolitan transportation planning, it was perceived by many that MPOs ascended to a new pinnacle of decision-making authority. In point of fact, while metropolitan planning was given new emphasis, ISTEA did little to change the decision-making role of MPOs. They were still planning organizations seeking to achieve a change by building consensus on investment priorities among many powerful players. As forums for decision-making, they remained a meeting ground where key organizations could come together to coordinate their priorities. ISTEA did little to enhance MPOs' authority and autonomy as independent institutional entities. One reason was simply that all existing MPOs were "grandfathered" in place. Hence, while the law seemed to retool them in principle, the old institutional context remained largely unchanged.

Key changes under ISTEA were more in the grants-administration aspects of the program than in the institutional and power relationships. The program's funding categories were substantially restructured, the number of programs was reduced, and the matching ratios were equalized at 80-20 across the highway and transit modes in order to level the playing field for making choices among modes. In addition, provision was made to transfer funds from highways to transit and vice versa. A clear connection was made between transportation-funding decisions and air-quality considerations by the "transportation conformity" requirement of the Clean Air Act of 1990 and a companion provision in ISTEA that required fiscally constrained transportation plans and programs. Federal oversight of project implementation was streamlined, and emphasis was increased on broader environmental considerations. The emphasis on multimodal and

intermodal considerations was clearly established, even though independent funding programs for transit and highways were maintained.

The actual change in MPO authority, however, is located in the area of program funding categories. The creation of the STP program gave MPOs a specific funding category over which to exercise discretion. It is a “tempered” discretionary authority, however, because the MPO neither receives a totally new funding responsibility nor does it expend the funds and implement projects. The metropolitan portion of the STP program actually replaced the Federal Aid Urban System (FAUS) program funds.¹¹

STP funds are similarly available in metropolitan areas, but there are some notable differences. FAUS funds could only be spent in urbanized areas or urban places.¹² STP funds are split between metropolitan areas with an urbanized area over 200,000 in population, urbanized areas between 5,000 and 200,000, and relatively rural areas less than 5,000 in population. The state DOT controls decisions about the use of funds for areas below 200,000, which amount to approximately two-thirds of the annual monies available nationwide. The funds available to metropolitan areas of over 200,000 populations are the “attributable” funds identified earlier. The MPO has the authority to determine which projects are funded with STP “attributable” funds. The state must make obligation authority available to these projects in the same ratio that obligation authority is made available to the state.¹³ Every three years, the state must ensure that this balance has occurred. It is noteworthy, however, that the state must make the funding available, but does not actually have to expend it. Hence, if a metropolitan project is not ready to

proceed when obligation authority is made available, the state may reallocate that portion of the obligation authority to projects inside or outside the metropolitan area to which it is attributable.

This matter of reallocation points out another dimension to the limits on MPO authority. Given that the MPO does not control construction directly, it may not be able to ensure implementation of projects. If a project sponsor (e.g., state DOT, city, county, transit agency, or other) does not expeditiously implement an STP-funded project, the MPO's priority determination may be undermined. Indeed, the MPO may find its priorities dependent on whether the sponsor chooses to move a project quickly or is exposed to delaying factors beyond its control (such as discovery of an unanticipated archaeological site). Indeed, the lack of familiarity with federal requirements can be a two edged sword. Sponsors can secure MPO priority only to lose momentum because of inadequate project management. In the end, the MPO is dependent on its ability to partner with others, and their enthusiasm and skills to make its priorities mean something.

In other areas of the highway funding program, the state still controls the utilization of funds, and the MPOs must negotiate projects in these categories with the state. In a similar vein, transit agencies control transit funds and the MPOs still must negotiate the use of these funds to meet metropolitan priorities. Finally, the transfer of funding is negotiated also, depending on the willingness of parties with control over the funding sources to see them utilized for non-traditional projects (e.g., highway funds for transit).

CMAQ funding is also a very flexible part of the federal-aid highway program, even though its use may be somewhat limited. In states with “non-attainment areas” for air quality, CMAQ funds may be used in only those areas; in states with no such areas, these funds are fully flexible and under the control of the state. The reason for the high degree of flexibility is simply that CMAQ funding was the primary “new pot” of funding under ISTEA. Because the old FAUS monies were replaced by STP funds, projects in line for FAUS funding simply were placed in the queue for STP funding. For example, one major MPO simply agreed that STP funds would be shared among local governments in its planning area in the same ratio as FAUS funds had been shared, even though the STP funds were not guaranteed to local governments directly. In contrast, CMAQ funds had no prior claimants and were “up for grabs” within the eligibility limits of the funds. There were no queues of established funding, although such queues emerged as soon as the program was implemented. Indeed, CMAQ has been utilized extensively for non-traditional highway projects, such as transit projects.

In summary, the extent of new authority for MPOs was situational rather than absolute. MPOs with attributable STP funding had to make the funding priorities stand up by getting others to implement them. They had to further ensure that when projects were ready to be funded, they were also ready to be implemented. Flexibility was available, but negotiations with others who controlled the funds were required to succeed. In most states, long-standing programs of backlogged projects often got higher priority than experimenting with untried flexing of funds. Only CMAQ-funded projects seemed

to give MPOs real new authority, and that occurred only where air-quality needs were identified. The MPOs found that they were given an opportunity to claim a seat at the table, rather than being given new “power.” They needed to find other reasons why their transportation “partners” were willing to listen to their claims and enforce them.

It appears that the maxim “the devil is in the details” has been validated again. The reality of program administration and implementation under ISTEA and TEA-21 has revealed a different reality than that touted in the broad policy thrust of the legislation.

INTERGOVERNMENTAL CONTEXT OF TRANSPORTATION: WHERE IS IT HEADED?

One of the indirect consequences of the ISTEA changes was the awakening of interest in transportation funding on the part of non-transportation interest groups. The Clinton administration fostered an undeclared policy of quietly developing integrated urban programs. In this effort, the U.S. DOT’s surface-transportation programs became a beacon for urban-oriented interests. U.S. DOT became a player in welfare-to-work issues, brownfield programs, empowerment zones and enterprise communities, housing, and other similar activities. The planning program requirements of ISTEA, with their 16 enumerated factors, suggested that transportation funding could be utilized to serve a number of interrelated social policy goals. Chief among these was air quality by virtue of its hard-wired connection to highway sanctions where clean-air standards were exceeded. Other perspectives were touted in addition, and some even called ISTEA the planners full

employment act, suspecting that comprehensive metropolitan and statewide planning was about to take a great leap forward.

The U.S. Environmental Protection Agency (EPA) has major responsibility for reviewing the air-quality aspects of the U.S. DOT program and supporting initiatives to consider land-use, sustainable development, livable communities, environmental justice, and anti-sprawl programs. The umbrella for these concerns was the need to address the strong trends toward decreasing density of metropolitan areas and the underlying consumption of green fields even while environmental goals were calling for more dense development patterns.

HUD also played a key role in sponsoring more regional approaches to housing and urban redevelopment through the empowerment zone/enterprise community program. HUD sought a coordinated regional approach to housing through the metropolitan transportation-planning program. In their eyes, the 16 planning factors mandated by ISTEA needed to be completely addressed. From a housing perspective, this represented a reopening of the regional planning effort that had prospered under the long-defunct HUD Section 701 comprehensive planning assistance program.¹⁴

Similarly, federal welfare reform of 1996 sparked the U.S. Department of Health and Human Services (HHS) to seize an opportunity to address the spatial mismatch that existed between inner-city residents and suburban jobs by coordinating planning for welfare-to-work participants through the metropolitan transportation planning process.

HHS recognized transportation planning in its Temporary Assistance for Needy Families (TANF) program, most notably by authorizing TANF funds to be used as local match to support other federal program funding. Both as part of a livable-communities initiative sponsored by the FTA and, in general in support of metropolitan concerns championed by the Clinton White House, support emerged for integrating welfare job access planning into MPO planning programs. The FHWA and the FTA even waived matching requirements for welfare-to-work job-planning activities.

The cumulative effect of these efforts was to arouse an entirely new cast of players, who clamored for access to the transportation planning process. Supported by stronger public involvement requirements adopted by the FHWA and the FTA, metropolitan and statewide planning processes (newly required by ISTEA) focused on engaging a broader range of community interests. The potential for accessing federal transportation dollars, in addition to HHS dollars, made players out of many of the traditional social-service agencies involved in welfare. For MPOs traditionally focused on new physical facilities, the new players and funds from HHS posed new challenges. In the end, new money was not in great supply for social program interests, but expectations were raised very high by the promise of coordinating federal programs and leveraging multiple funding pots. Provisions in TEA-21 that directed the secretary of the U.S. DOT to encourage the coordination of federally funded non-emergency services further reinforced this rising expectation. For some MPOs that already had a strong social service constituency (such as Provo-Orem, Utah, which is also the Area Agency on

Aging, and the Lane Council of Governments in Eugene, Oregon) this further reinforced their multi-purpose regional agenda.

The engagement by transportation planners in these regional social service agendas reinforced the image of expanded purpose, mission and capacity on behalf of MPOs. In the reauthorization effort and subsequent regulatory process, the Transportation Equity Network (TEN) and related organizations became aggressive players seeking to modify federal transportation funding requirements. The traditional dominance of road-building agencies and transportation operating agencies, if not broken, was certainly challenged. With the next reauthorization effort already underway, these interests are lining up to further cement and extend the gains made under TEA-21.

REAUTHORIZATION UNCERTAINTY

The course of future federal surface-transportation funding is unclear. During the last reauthorization effort, serious initiatives surfaced to reduce federal expenditures. The debate over an appropriate federal role generated bills in Congress in both 1996 and 1997 that would have cut the federal gasoline tax from 18.3 cents per gallon to just 6.3 cents, of which only 2 cents would have been for transportation. The federal transportation role would have been reduced to helping the states maintain the Interstate Highway System. This challenge to the federal role was serious enough to spur the EPA to commission a special forum by the Eno Transportation Foundation to explore the environmental consequences of a reduced federal role in transportation.¹⁵ Seemingly, the sheer size of the federal funding effort, more than the specific national benefits of transportation

services, made the compelling argument for continuing the current federal role.

Continuing laments of inadequate funding and the appeal of earmarks as a coalition builder fueled this argument.

The size of the transportation program and its discretionary flexibility are like magnets attracting greater attention from other advocates who sense the availability of funds to support their priorities. Even growth management advocates, who find new highways to be the root of problems, find transportation funding hard to resist. While they blame increased highway funding for inducing travel beyond that which already exists or would otherwise exist, they sense that simply killing federal funding would eliminate a substantial source of money to support alternative transportation modes. Similarly, in the context of environmental justice, the construction of more impervious surfaces has, in some older communities, increased storm-water run-off, which has stressed already overloaded storm-sewer systems in minority communities. Highway funds can be used to help mitigate this environmental impact by supporting the elimination of combined sewer systems. In these examples, supporters of non-traditional issues, indirectly related to transportation, find that they can benefit directly from transportation funding. While traditional transportation advocates see these issues as diluting available transportation funding, the new advocates articulate an “It’s about time attitude,” that reflects a perspective that it is about time that transportation paid for its consequences.

Despite three decades of increasingly integrated surface-transportation funding for highways and transit, the national mindset is less clear today about the direction and purpose of the national transportation initiative. The 1990s were particularly tumultuous, reflecting the changing character of the federal role. Despite the continuation of the grant-in-aid tradition for both transit and highways, the competition from other sources of funding and dilution of public sentiment regarding a justifiable role for a federal transportation policy have led to a growing ambiguity of purpose and direction in the federal transportation role. The result has been to create significant gaps in expectations regarding the future of federal involvement. It also has opened the door to greater uncertainty regarding expected outcomes and consequences.

As the 106th Congress organized and began to address the Bush administration's policy agenda, concern for ameliorating congestion as a means of improving travel began to increase. However, building new capacity is not a universal answer to increased trip-making and trip lengths in many metropolitan areas, especially in those areas facing air quality challenges. For slow-growth or no-growth areas, congestion is an issue, but for different reasons. In many of these areas, decreased density rather than absolute growth in trip-making is raising serious questions about whether it is possible to build a way out of congestion and whether the motorist should pay an increased share of the added costs of such development. Finally, for some states, particularly those in the upper Mid-west, new capacity is not the issue; infrastructure reconstruction and replacement is a more pressing concern. Are any of these goals justification for continuing a large federal

program? Alternatively, do stronger justifications lie in emerging economic, social, and environmental goals?

The state of the American federal system, as reflected in the transportation programs has not been more uncertain and ambiguous for 450 years. While the huge amount of funding is extraordinarily attractive, the purposes to which it should be put may become increasingly poorly defined in the heat of legislative debate. The future of the program may not be determined by the outcome of the substantive debate over the purpose and function of federal transportation funding but rather on the more generalized concern of what overall federal funding, spending and budgeting should be.

As we look at the “state of American federalism”, the pending reauthorization of the surface transportation program presents a reflection of the increasingly complex political tug-of-war for control of the policy agenda. Traditional stakeholders such as the American Association of State Highway and Transportation Officials and the American Public Transportation Association find themselves struggling with policy initiatives from aspirants to federal funding. It has not been uncommon for these organizations to lament the loss of their traditional “special relationship” with FHWA and FTA. Special interest lobbying also has fueled the earmarking process as a means of building coalitions that can achieve passage of a bill (authorization or appropriation). Increasing earmarks, additions, special studies and expanded eligibilities, are symptomatic of both a growing diffusion of the public purpose and federal role in the transportation policy agenda.

AUTHOR'S NOTE: The views expressed herein are not those of the FHWA or US Department of Transportation. In addition, the comments of Paul Verchinski, Team Leader, Statewide and Intermodal Planning, Federal Transit Administration, Barna Juhasz, Director, Office of Highway Policy Information, Federal Highway Administration, and Richard Osborne, Transportation Finance Specialist, Office of Legislation and Strategic Planning, Federal Highway Administration have substantially enhanced the accuracy of the program descriptions presented. George Schoener, Director, Office of Metropolitan Planning and Programs, also reviewed the manuscript.

¹ FHWA By Day: A Look at the History of the Federal Highway Administration, FHWA, 1996.

² Weiner, Edward, Urban Transportation Planning in the United States: A Historical Overview, US DOT, 1997, p. 48.

³ A fixed guideway may be a dedicated busway, light rail or heavy rail transit. While some older rail cities (e.g., Boston, Philadelphia and New York) face major capital rehabilitation issues, on occasion they also extend existing systems through new lines and extensions. There are an increasing number of new rail cities, which have been adding new service entirely. The San Francisco Bay Area was first among these, followed by San Diego, Portland and other US cities.

⁴ Funding from a trust fund is only one dimension of contract authority. The absence of an annual appropriation is another distinguishing feature, exempting the responsible agency from some of the annual budget trepidation faced by others.

⁵ ISTEA initiated (continued under TEA-21) a process of allowing State DOTs to take responsibility for individual projects subject to Federal program reviews of their procedures (Title 23 USC 106). All Federal requirements must still be met but the day-to-day oversight is the responsibility of the State DOT.

⁶ There are a few MPOs, which are operating agencies for transit, and some which can build highways, e.g., Reno, Nevada.

⁷ A TMA is an urbanized area over 200,000 in population as defined by the US Bureau of the Census.

Some TMAs are served by multiple MPOs and at least one MPO has multiple TMAs (Title 23 USC 134).

⁸ U.S. Advisory Commission on Intergovernmental Relations, MPO Capacity: Improving the Capacity of Metropolitan Planning Organizations to Help Implement National Transportation Policies (Washington, D.C.: ACIR, May, 1995), p. 35.

⁹ Ibid.

¹⁰ Bruce D. McDowell, "Regions Under Regions," Planning 50 (August 1984): 25-29.

¹¹ The FAUS program (Title 23 USC 810(D)) was available to fund highways in metropolitan areas. The non-metropolitan portion of the STP program replaced the Secondary Road program that counties generally relied on to help support their roads.

¹² Urban places were defined by the US Bureau of the Census and constituted population concentrations under 50,000 but over 2500 with urban densities (1990 Urban and Rural Definitions – www.census.gov/population/censusdata/urdef.txt).

¹³ Annually Congress establishes the percentage of authorizations that may obligated by States. States may manage total obligation authority by utilizing some categories for projects more than others so long as total obligation authority is not exceeded. The exception is STP attributable funds, which must be offered to eligible metropolitan areas at the same rate as the overall percentage. If not utilized by a metropolitan area, the state can under or over obligate funds in this category.

¹⁴ The last remnants of that program were abolished in 1981.

¹⁵ The federal highway and transit programs affect virtually everyone in the nation, and they carry with them a wide array of environmental regulations, planning requirements, and program funds to mitigate air, water, and noise pollution problems. The absence of these federal programs would not remove some of the environmental regulations that operate through EPA and the states, but it would remove many of the tools that are now used to comply with them. Especially missed would be the heavily funded air-quality planning and mitigation activities. In a few states, most notably California, state programs could step in to take up the slack, but in most states the removal of the federal transportation programs would most likely leave a substantial void in the arsenal of planning and funding tools for protecting the environment. Bruce

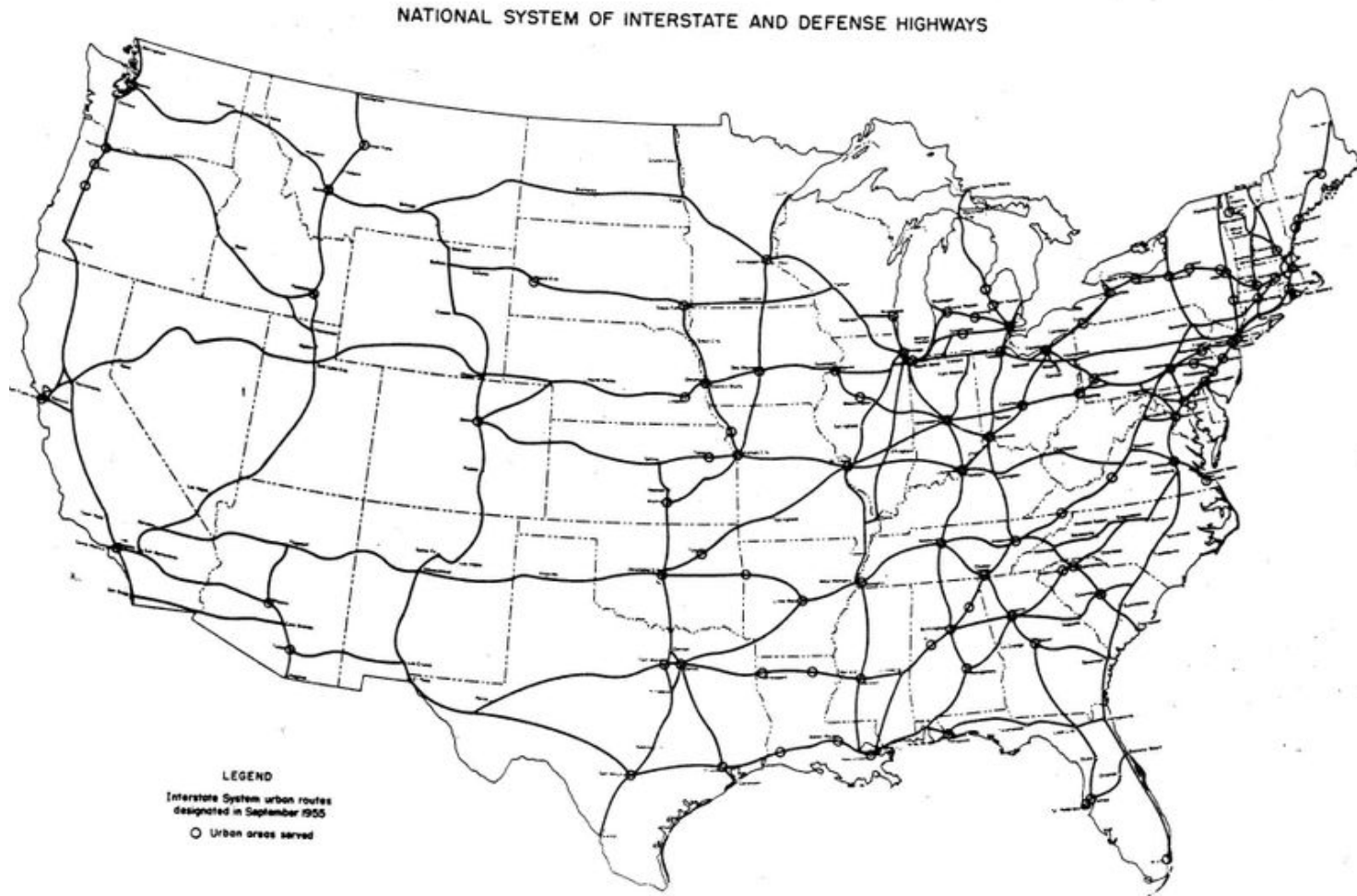
McDowell, Environmental Consequences of a Reduced Federal Role in Transportation, proceedings of an
Eno Foundation Forum (Lansdown, VA: The Eno Foundation, Inc., 1997).

Past as Prologue?: A Brief Legislative History of the Modern Federal Aid Highway Program



John W. Fischer
Congressional Research Service
Library of Congress

Highway Policy in the 1950s



The 1960s

- A Slowly Expanding Federal Program
 - Highway Beautification Act of 1965
 - Highway Safety Act of 1966
 - Appalachian Highway Program created 1965 (becomes a trust fund funded program in TEA21)
 - Federal-Aid Highway Act of 1968
 - Adds 1,500 miles to the interstate system
 - Extends Davis-Bacon to all federal-aid highway projects

1960s (continued)



Interstate 287 - 1966

- Department of Transportation Created 1966
 - Mandate to create a unified national transportation system
 - BPR becomes FHWA
 - Urban Mass Transportation Act of 1964
 - National Environmental Policy Act of 1969 (NEPA)
 - Clean Air Amendments of 1970

The 1970s



- Highway Act of 1970
Urban System added
Bus lanes, some transit
become eligible for
highway funding
Minimum apportionment
of interstate funding
for each state
NHTSA created
70 – 30 match for non-
interstates

The 1970s (continued)

- Multiple Acts – 1973, 1974 (amendments), & 1976 – all increased flexibility and transferability
- Congressional Budget and Impoundment Control Act of 1974
 - Ends impoundment
 - Creates the limitation on obligations
- Major proposals for program change – Nixon - revenue sharing, Ford & Carter - proposals to divert fuel taxes to general fund – all ignored by Congress
- Other provisions added in the 70s
 - Interstate transfer provisions added
 - 3R (resurfacing, restoring, & rehabilitating)(76 Act)

1970s (Continued)

- STAA of 1978

First combined Act giving transit, safety, titular equal status, if not equal funding

75 – 25 matching share

“Buy America” added

Center of political support for highway program moves from Executive to Legislative Branch

The 1980s

- **STAA of 1982**

Last fuel tax increase
dedicated exclusively
to transportation

Creates transit account

Originally opposed by
Reagan Admin –
Adopted as a “user
fee” not a tax

Promoted as a jobs bill
for recession

4R emphasis

21 drinking age
requirement

Earmarks – 10
“special
demonstration
projects”

85% return on core
highway programs

The 1980s (continued)



- Deficit Reduction Act of 1984

Increases diesel tax

Constrains spending

Unexpended trust fund
balance increases

- *America in Ruins*
(Mianus River and Schoharie Creek bridge collapses)
The so-called
infrastructure crisis is
born

The 1980s (continued)

- **STURAA of 1987**

- 152 earmarks

- 85% return on contributions guarantee maintained, but new method for computing it adopted

- Pilot toll program created

- Reagan veto overridden

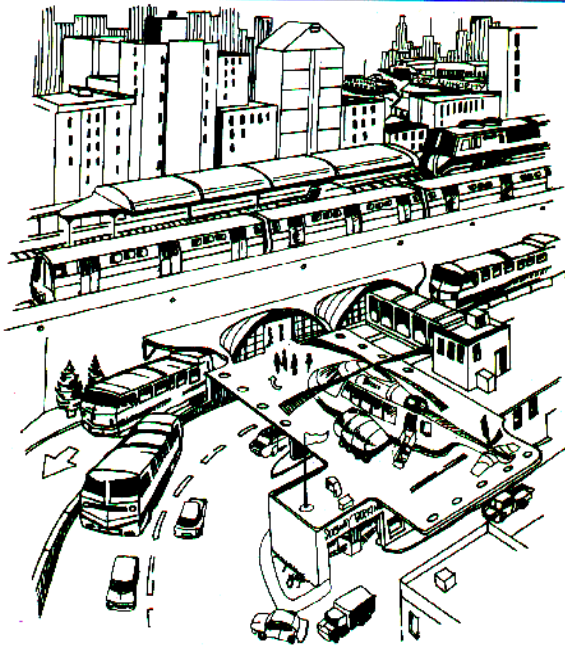
The 1990s: Redirection – the TEA Years



U.S. Department of Transportation

INTERMODAL PASSENGER TERMINAL FACILITIES PROJECT SUMMARIES

*A COMPENDIUM OF PROPOSED, ACTIVE, AND COMPLETED
INTERMODAL PASSENGER TERMINAL FACILITIES*



December 1994

Prepared by the
U.S. Department of Transportation
Intermodal Terminal Committee

- Deficit Reduction
- International Competitiveness
- OBRA 1990 & OBRA 1993 – fuel taxes raised, but only in part for transportation
- The program structure that built the Interstates clearly no longer works

The 1990s (continued)

- **ISTEA 1991**

New program structure – NHS, STP (enhancement & safety set-asides),

CMAQ, IM, & Bridge

New roles for MPOs

transferability & flexibility broadened

90% minimum guarantee – complicated 5 element structure (almost immediate discontent in some states)

538 demonstration projects (earmarks)

80 – 20 match for all but IM (90 – 10)

The 1990s: (continued)

- **NHS Act of 1995**

Officially designated the NHS routes

Ended the 55 mph speed limit & motorcycle helmet requirements

Pilot State Infrastructure Bank (SIB) program

The 1990s (continued)

- Taxpayers Relief Act of 1997
 - Redirects all fuel taxes into the highway trust fund
- **TEA21 1998**
 - 40% increase in funding
 - Created new budget accounts for highway and transit accounts. The so-called “firewalls”
 - Creates RABA system
 - 90.5% return – complicated minimum guarantee system, became largest single highway program

The 00s

- **SAFETEA-LU 2005**

Continues historical trends

More of everything – money, programs, 5,500 plus highway earmarks, etc.

92% Equity bonus, still complicated to understand – already discontent amongst some states

Surface Transportation Policy Today?



Observations

- Surface transportation evolves – primarily by addition, rarely by subtraction
- Continued growth in the coalition of interest groups that support federal surface transportation programs – Creates opportunities, but also, as the previous slide suggests, problems, especially as expectations grow
- Earmarking is becoming a dominant element of the federal-aid program for good or for ill.
- No surface transportation reauthorization in two decades has been enacted prior to the expiration of the existing authorization.
- Although there have been peaks and valleys in the growth of transportation funding, there have been far more peaks than valleys.

Observations (continued)

- Highway program remains a popular vehicle for mandates on a wide range of topics.
- Since Interstate Highway focus has disappeared the focus of the entire program has become increasingly blurry.
- Philosophical underpinning of the modern surface transportation program seems to be that we have an unlimited number of unmet transportation infrastructure needs and that the federal program should be expanded to meet as many of these as possible. This is VERY different from the 1956 view.
- The Donor-Donee question is now the centerpiece of legislative debate. This begs the question of what the focus of the federal program is and what the purpose of the federal program is.

Prescience?

“Highway legislation scatters billions of politically-guided Federal Dollars over the country as though they were shot from a blunderbuss. These widely scattered dollars will not build those roads having the greatest national interest”

Senator Prescott Bush

Congressional Quarterly Almanac, 1955. p. 436.

GAO

Testimony

Before the Committee on Environment and Public
Works
U.S. Senate

For Release on Delivery
Expected at 10:00 a.m. EDT
Monday, September 30, 2002

**SURFACE AND
MARITIME
TRANSPORTATION**

**Challenges and Strategies
for Enhancing Mobility**

Statement of JayEtta Z. Hecker
Director, Physical Infrastructure Issues



Mr. Chairman and Members of the Committee:

We appreciate the opportunity to testify on the challenges faced by the surface and maritime transportation systems in maintaining and improving mobility. Your hearing today focuses on important issues about the physical condition, performance, and future investment requirements of the nation's roadways and bridges.¹ Our remarks will focus on the performance of the transportation systems. More specifically, we will discuss the ultimate desired outcome of transportation infrastructure improvements—enhanced mobility—and the possible strategies for achieving that outcome.²

The scope of the U.S. surface and maritime transportation systems—which primarily includes roads, mass transit systems, railroads, and ports and waterways³—is vast. One of the major goals of these systems is to provide and enhance mobility. Mobility provides people with access to goods, services, recreation, and jobs; provides businesses with access to materials, markets, and people; and promotes the movement of personnel and material to meet national defense needs. However, the U.S. surface and maritime transportation systems have become congested and concerns have been raised about the burden they impose on the nation's quality of life through wasted energy, time, and money; increased pollution; and threats to public safety. Barriers to transportation accessibility for certain population groups and the level of financial resources available to address transportation problems are also major

¹ We have not had an opportunity to review the Department of Transportation's *Conditions and Performance Report* that is expected to be released at today's hearing.

² In a July 2001 testimony before the former Subcommittee on Transportation and Infrastructure, Senate Committee on Environment and Public Works, we reviewed the infrastructure investment estimates of seven federal agencies and found that they focus mostly on the condition of the infrastructure rather than the desired outcomes (e.g., less traffic congestion) that can be expected from additional infrastructure investments. We cautioned against relying mainly on measures of need based primarily on the condition of existing infrastructure and instead suggested comparing the costs and benefits of alternative approaches for reaching outcomes, including noncapital alternatives (such as strategies to manage demand rather than build new infrastructure). See U.S. General Accounting Office, *U.S. Infrastructure: Funding Trends and Federal Agencies' Investment Estimates*, GAO-01-986T (Washington, D.C.: July 23, 2001).

³ In this testimony, we define the surface transportation modes to include highways, mass transit systems, and railroads; and the maritime transportation modes to include ports, inland waterways, and the intermodal connections leading to them. Pipelines were not part of our review.

concerns. Balancing the goal of improving mobility with other social goals, such as environmental preservation, will present challenges.

Our statement is based on a report that we are releasing today on surface and maritime transportation mobility.⁴ We will discuss (1) key challenges in maintaining and improving mobility and (2) key strategies for addressing the challenges. Our report is primarily based on expert opinion drawn from two panels of surface and maritime transportation experts that we convened in April 2002. Our work also included a review of reports prepared by federal agencies, academics, and industry groups. Appendix I provides further information on our scope and methodology and appendix II contains a list of relevant GAO products.

In summary:

- With increasing passenger and freight travel, the surface and maritime transportation systems face a number of challenges in ensuring continued mobility. These challenges include:
 - **Preventing congestion from overwhelming the transportation system.** Increasing passenger and freight travel has already led to increasing levels of congestion at bottlenecks and peak travel times in some areas. For example, the amount of traffic experiencing congestion during peak travel periods doubled from 33 percent in 1982 to 66 percent in 2000 in 75 metropolitan areas studied by the Texas Transportation Institute.⁵ Freight mobility is also affected by increasing congestion within specific heavily used corridors and at specific bottlenecks that tend to involve intermodal connections, such as border crossings, and road and rail connections at major seaports within metropolitan areas. Furthermore, congestion is increasing at aging and increasing unreliable locks on the inland waterways.
 - **Ensuring access to transportation for certain underserved populations (including some elderly, poor, and rural populations that have restricted mobility) and achieving a balance between**

⁴ U.S. General Accounting Office, *Surface and Maritime Transportation: Developing Strategies for Enhancing Mobility: A National Challenge*, GAO-02-775 (Washington, D.C.: Aug. 30, 2002).

⁵ David Shrank and Tim Lomax, *2002 Urban Mobility Report* (College Station, Tex.: Texas Transportation Institute, June 2002).

enhancing mobility and giving due regard to environmental and other social goals. Policies and patterns of development that encourage automobile dependence and favor provision of transit services with inflexible routes and schedules—such as subway or bus—may disadvantage some groups by limiting their access to needed services or jobs. The surface and maritime transportation systems also face the challenge of effectively addressing pollution problems caused by increased travel levels. Emissions from passenger and freight vehicles, shipping waste disposal practices, and excessive noise levels have contributed to the degradation of air quality, disruption of ecosystems, and other problems.

- There is no one solution for the mobility challenges facing the nation, and our expert panelists indicated that numerous approaches are needed to address these challenges. From these discussions, we believe that the wide range of approaches can be clustered into three key strategies that may help transportation decisionmakers at all levels of government address mobility challenges. These strategies include the following:
 - **Focus on the entire surface and maritime transportation system rather than on specific modes or types of travel to achieve desired mobility outcomes.** Transportation agencies at the federal, state, and local level might shift focus from their current emphasis on single modes to consider performance outcomes of all modes in addressing mobility challenges, and to recognize interactions across modes between passenger and freight traffic, and between public and private interests. This is important because addressing the mobility challenges outlined above can involve a scope beyond a local jurisdiction or a state line, and may require coordination across multiple modes, types of travel, or types of transportation providers and planners.
 - **Use a full range of techniques to achieve desired mobility outcomes.** Using various techniques—such as new construction, corrective and preventive maintenance, rehabilitation, operations and system management, and pricing—to address complex mobility challenges, may be more effective than placing emphasis on any one technique.
 - **Provide more options for financing mobility improvements and consider additional sources of revenue.** This strategy—which involves providing more flexibility in funding across modes, expanding financial support for alternative financing mechanisms (e.g., credit

assistance to state and local governments), and considering various revenue-raising methods—may offer promise for addressing key mobility problems.

Background

The U.S. surface and maritime transportation systems facilitate mobility through an extensive network of infrastructure and operators, as well as through the vehicles and vessels that permit passengers and freight to move within the systems. The systems include 3.9 million miles of public roads, 121,000 miles of major private railroad networks, and 25,000 miles of commercially navigable waterways. They also include over 500 major urban public transit operators in addition to numerous private transit operators, and more than 300 ports on the coasts, Great Lakes, and inland waterways.

Maintaining transportation systems is critical to sustaining America's economic growth. Efficient mobility systems significantly affect economic development: cities could not exist and global trade could not occur without systems to transport people and goods. The pressures on the existing transportation system are mounting, however, as both passenger and freight travel are expected to increase over the next 10 years, according to Department of Transportation (DOT) projections. Passenger vehicle travel on public roads is expected to grow by 24.7 percent from 2000 to 2010. Passenger travel on transit systems is expected to increase by 17.2 percent over the same period. Amtrak has estimated that intercity passenger rail ridership will increase by 25.9 percent from 2001 to 2010. Preliminary estimates by DOT indicate that tons of freight moved on all surface and maritime modes—truck, rail, and water—are expected to increase by 43 percent from 1998 through 2010, with the largest increase expected to be in the truck sector. The key factors behind increases in passenger travel, and the modes travelers choose, are expected to be population growth, the aging of the population, and rising affluence. For freight movements, economic growth, increasing international trade, and the increasing value of cargo shipped may affect future travel levels and the modes used to move freight.

The relative roles of each sector involved in surface and maritime transportation activities—including the federal government, other levels of government, and the private sector—vary across modes. For public roads, the federal government owns few roads but has played a major role in

funding the nation's highways. With the completion of the interstate highway system in the 1980s—and continuing with passage of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)⁶ and its successor legislation, the Transportation Equity Act for the 21st Century (TEA-21)⁷, in 1998—the federal government shifted its focus toward preserving and enhancing the capacity of the system. While the federal government's primary role has been to provide capital funding for the interstate system and other highway projects, state and local governments provide the bulk of the funding for public roads in the United States and are responsible for operating and maintaining all nonfederal roads, including the interstate system.

For transit systems—which include a variety of multiple-occupancy vehicle services designed to transport passengers on local and regional routes—the federal government provides financial assistance to state and local transit operators to develop new transit systems and improve, maintain, and operate existing systems. The largest portion of capital funding for transit comes from the federal government, while the primary source for operating funds comes from passenger fares.

The respective roles of the public and private sector and the revenue sources vary for passenger as compared with freight railroads. For passenger railroads, the Rail Passenger Service Act of 1970 created Amtrak to provide intercity passenger rail service because existing railroads found such service unprofitable. Since its founding, Amtrak has rebuilt rail equipment and benefited from significant public investment in track and stations, especially in the Northeast corridor, which runs between Boston and Washington, D.C. The role of the federal government in providing financial support to Amtrak is currently under review amid concerns about the corporation's financial viability and discussions about the future direction of federal policy toward intercity rail service. For freight railroads, the private sector owns, operates, and provides almost all of the financing for freight railroads. Currently, the federal government plays a relatively small role in financing freight railroad infrastructure by offering some credit assistance to state and local governments and railroads for capital improvements.

⁶ P.L. 102-240 (Dec. 18, 1991).

⁷ P.L. 105-178 (June 9, 1998).

The U.S. maritime transportation system primarily consists of waterways, ports, the intermodal connections (e.g., inland rail and roadways) that permit passengers and cargo to reach marine facilities, and the vessels and vehicles that move cargo and people within the system. The maritime infrastructure is owned and operated by an aggregation of state and local agencies and private companies, with some federal funding provided by the Corps of Engineers, the U.S. Coast Guard, and DOT's Maritime Administration.

Funding authorization for several key federal surface transportation programs will expire soon. For example, TEA-21's authorization of appropriations expires in fiscal year 2003 and the Amtrak Reform and Accountability Act of 1997⁸ authorized federal appropriations for Amtrak through the end of fiscal year 2002. In addition, the federal funding processes and mechanisms for the maritime transportation system are currently under review by two interagency groups.⁹

Key Mobility Challenges Include Growing Congestion and Other Problems

There are several challenges to mobility. Three of the most significant are growing congestion, ensuring access to transportation for certain underserved populations, and addressing the transportation system's negative effects on the environment and communities.

Congestion

Ensuring continued mobility involves preventing congestion from overwhelming the transportation system. Congestion is growing at localized bottlenecks (places where the capacity of the transportation system is most limited) and at peak travel times on public roads, transit systems, freight rail lines, and at freight hubs such as ports and borders where freight is transferred from one mode to another. In particular:

- For local urban travel, a study by the Texas Transportation Institute¹⁰ showed that the amount of traffic experiencing congestion during peak

⁸ P.L. 105-134 (Dec. 2, 1997).

⁹ The two groups are the Interagency Committee on the Marine Transportation System and the Marine Transportation System National Advisory Council.

¹⁰ Shrank and Lomax, *2002 Urban Mobility Report*.

travel periods doubled from 33 percent in 1982 to 66 percent in 2000 in the 75 metropolitan areas studied. In addition, the average time per day that roads were congested increased over this period, from about 4.5 hours in 1982 to about 7 hours in 2000. Increased road congestion can also affect public bus and other transit systems that operate on roads. Some transit systems are also experiencing increasing rail congestion at peak travel times.¹¹ In addition, concerns have been raised about how intercity and tourist travel interacts with local traffic in metropolitan areas and in smaller towns and rural areas, and how this interaction will evolve in the future. According to a report sponsored by the World Business Council for Sustainable Development, *Mobility 2001*,¹² capacity problems for intercity travelers are severe in certain heavily traveled corridors, such as the Northeast corridor, which links Washington, D.C., New York, and Boston. In addition, the study said that intercity travel may constitute a substantial proportion of total traffic passing through smaller towns and rural areas.

- Congestion is expected to increase on major freight transportation networks at specific bottlenecks, particularly where intermodal connections occur, and at peak travel times. This expectation raises concerns about how interactions between freight and passenger travel and how increases in both types of travel will affect mobility in the future. Trucks contribute to congestion in metropolitan and other areas where they generally move on the same roads and highways as personal vehicles, particularly during peak periods of travel. In addition, high demand for freight, particularly freight moved on trucks, exists in metropolitan areas where overall congestion tends to be the worst.
- With international trade an increasing part of the economy and with larger containerships being built, some panelists indicated that more pressure will be placed on the already congested road and rail connections to major U.S. seaports and at the border crossings with Canada and Mexico.

¹¹ For example, the Washington Metropolitan Area Transit Authority's studies on crowding found that, of the more than 200 peak morning rail trips observed over a recent 6-month period, on average, 23 percent were considered "uncomfortably crowded or crush loads." See U.S. General Accounting Office, *Mass Transit: Many Management Successes at WMATA, but Capital Planning Could Be Enhanced*, [GAO-01-744](#) (Washington, D.C.: July 2, 2001).

¹² Massachusetts Institute of Technology and Charles River Associates, Inc., *Mobility 2001: World Mobility at the End of the Twentieth Century and Its Sustainability* (World Business Council for Sustainable Development, Aug. 2001).

According to a DOT report,¹³ more than one-half of the ports responding to a 1997 survey of port access issues identified traffic impediments on local truck routes as the major infrastructure problem. This congestion has considerable implications for our economy given that 95 percent of our overseas trade tonnage moves by water, and the cargo moving through the U.S. marine transportation system contributes billions of dollars to the U.S. gross domestic product.¹⁴

- Railroads are beginning to experience more severe capacity constraints in heavily used corridors, such as the Northeast corridor, and within major metropolitan areas, especially where commuter and intercity passenger rail services share tracks with freight railroads. Capacity constraints at these bottlenecks are expected to worsen in the future.
- On the inland waterways, congestion is increasing at aging and increasingly unreliable locks. According to the Corps of Engineers, the number of hours that locks were unavailable due to lock failures increased in recent years, from about 35,000 hours in 1991 to 55,000 hours in 1999, occurring primarily on the upper Mississippi and Illinois rivers. Also according to the Corps of Engineers, with expected growth in freight travel, 15 of 26 locks that they studied are expected to exceed 80 percent of their capacity by 2020, as compared to 4 that had reached that level in 1999.

Some of the systemic factors that contribute to congestion include (1) barriers to building enough capacity to accommodate growing levels of travel; (2) challenges to effectively managing and operating transportation systems; and (3) barriers to effectively managing how, and the extent to which, transportation systems are used. First, there is insufficient capacity at bottlenecks and during peak travel times to accommodate traffic levels for a variety of reasons. For example, transportation infrastructure (which is generally provided by the public sector, except for freight railroads) takes a long time to plan and build, is often costly, and can conflict with other social goals such as environmental preservation and community maintenance. Furthermore, funding and planning rigidities in the public

¹³ *An Assessment of the U.S. Marine Transportation System* (Washington, D.C.: U.S. Department of Transportation, Sept. 1999).

¹⁴ U.S. General Accounting Office, *Marine Transportation: Federal Financing and a Framework for Infrastructure Investments*, [GAO-02-1033](#) (Washington, D.C.: Sept. 9, 2002).

institutions responsible for providing transportation infrastructure tend to promote one mode of transportation, rather than a combination of balanced transportation choices, making it more difficult to deal effectively with congestion. In addition, some bottlenecks occur where modes connect, and because funding is generally mode-specific, dealing with congestion at these intermodal connections is not easily addressed.

Second, many factors related to the management and operation of transportation systems can contribute to increasing congestion. Congestion on highways is in part due to poor management of traffic flows on the connectors between highways and poor management in clearing roads that are blocked due to accidents, inclement weather, or construction. For example, in the 75 metropolitan areas studied by the Texas Transportation Institute, 54 percent of annual vehicle delays in 2000 were due to incidents such as breakdowns or crashes. In addition, the Oak Ridge National Laboratory reported that, nationwide, significant delays are caused by work zones on highways; poorly timed traffic signals; and snow, ice, and fog.¹⁵

Third, some panelists said that congestion on transportation systems is also due in part to inefficient pricing of the infrastructure because users—whether they are drivers on a highway or barge operators moving through a lock—do not pay the full costs they impose on the system and on other users for their use of the system. If travelers and freight carriers had to pay a higher cost for using transportation systems during peak periods to reflect the full costs they impose, they might have an incentive to avoid or reschedule some trips and to load vehicles more fully, possibly resulting in less congestion.

Panelists also noted that the types of congestion problems that are expected to worsen involve interactions between long-distance and local traffic and between passengers and freight. Existing institutions may not have the capacity or the authority to address them. For example, some local bottlenecks may hinder traffic that has regional or national significance, such as national freight flows from major coastal ports, or can affect the economies and traffic in more than one state. Current state and local planning organizations may have difficulty considering all the

¹⁵ S.M. Chin, O. Franzese, D.L. Greene, H.L. Hwang, and R. Gibson, *Temporary Losses of Capacity Study and Impacts on Performance*, Report No. ORNL/TM-2002/3 (Oak Ridge, Tenn.: Oak Ridge National Laboratory, May 2002).

costs and benefits related to national or international traffic flows that affect other jurisdictions as well as their own. Furthermore, in our recent survey of states, most states reported that the increasing volume of both car and truck traffic over the next decade would negatively affect the physical condition of pavement and bridges and the safety of their interstate highways.¹⁶

Other Mobility Challenges

Besides dealing with the challenge of congestion, ensuring mobility also involves ensuring access to transportation for certain underserved populations. Settlement patterns and dependence on automobiles limit access to transportation systems for some elderly people and low-income households, and in rural areas where populations are expected to expand.

The elderly have different mobility challenges than other populations because they are less likely to have drivers' licenses, have more serious health problems, and may require special services and facilities, according to the Department of Transportation's 1999 *Conditions and Performance* report.¹⁷ People who cannot drive themselves tend to rely on family, other caregivers, or friends to drive them, or find alternative means of transportation. Many of the elderly also may have difficulty using public transportation due to physical ailments. As a result, according to the 1999 *Conditions and Performance* report and a 1998 report about mobility for older drivers,¹⁸ they experience increased waiting times, uncertainty, and inconvenience, and they are required to do more advance trip planning. These factors can lead to fewer trips taken for necessary business and for recreation, as well as restrictions on times and places that healthcare can be obtained. As the population of elderly individuals increases over the next 10 years, issues pertaining to access are expected to become more prominent in society.

¹⁶ U.S. General Accounting Office, *Highway Infrastructure: Interstate Physical Conditions Have Improved, but Congestion and Other Pressures Continue*, [GAO-02-571](#) (Washington, D.C.: May 31, 2002).

¹⁷ Federal Highway Administration and Federal Transit Administration, *1999 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance* (Washington, D.C.: U.S. Department of Transportation, 2000).

¹⁸ Jon E. Burkhardt, Arlene M. Berger, Michael Creedon, and Adam T. McGavock, *Mobility and Independence: Changes and Challenges for Older Drivers* (July 1998). This report was developed under a cooperative agreement with the U.S. Department of Health and Human Services (DHHS), under the auspices of the Joint DHHS/DOT Coordinating Council on Access and Mobility.

Lower income levels can also be a significant barrier to transportation access. The cost of purchasing, insuring, and maintaining a car is prohibitive to some households, and 26 percent of low-income households do not own a car, compared with 4 percent of other households, according to the 1999 *Conditions and Performance* report. Among all low-income households, about 8 percent of trips are made in cars that are owned by others as compared to 1 percent for other income groups. Furthermore, similar uncertainties and inconveniences apply to this group as to the elderly regarding relying on others for transportation. In addition, in case studies of access to jobs for low-income populations, Federal Transit Administration (FTA) researchers found that transportation barriers to job access included gaps in transit service, lack of knowledge of where transit services are provided, and high transportation costs resulting from multiple transfers and long distances traveled.¹⁹

Rural populations, which according to the 2000 Census grew by 10 percent over the last 10 years, also face access problems. Access to some form of transportation is necessary to connect rural populations to jobs and other amenities in city centers or, increasingly, in the suburbs. Trips by rural residents tend to be longer due to lower population densities and the relative isolation of small communities. Therefore, transportation can be a challenge to provide in rural areas, especially for persons without access to private automobiles. A report prepared for the FTA in 2001²⁰ found that 1 in 13 rural residents lives in a household without a personal vehicle. In addition, according to a report by the Coordinating Council on Access and Mobility,²¹ while almost 60 percent of all nonmetropolitan counties had some public transportation services in 2000, many of these operations were small and offered services only to limited geographic areas during limited times.

Finally, transportation can also negatively affect the environment and communities by increasing the levels of air and water pollution. As a result of the negative consequences of transportation, tradeoffs must be made

¹⁹ Federal Transit Administration, *Access to Jobs: Planning Case Studies* (Washington, D.C: U.S. Department of Transportation, Sept. 2001).

²⁰ Community Transportation Association of America, *Status of Rural Public Transportation-2000* (April 2001).

²¹ Coordinating Council on Access and Mobility, *Planning Guidelines for Coordinated State and Local Specialized Transportation Services* (Washington, D.C: U.S. Department of Transportation, Dec. 20, 2000).

between facilitating increased mobility and giving due regard to environmental and other social goals. For example, transportation vehicles are major sources of local, urban, and regional air pollution because they depend on fossil fuels to operate. Emissions from vehicles include sulfur dioxide, lead, carbon monoxide, volatile organic compounds, particulate matter, and nitrous oxides. Vehicle emissions in congested areas can trigger respiratory and other illnesses, and runoff from impervious surfaces, such as highways, can carry pollutants into lakes, streams, and rivers, thus threatening aquatic environments.²²

Freight transportation also has significant environmental effects. Trucks are significant contributors to air pollution. According to the American Trucking Association, trucks were responsible for 18.5 percent of nitrous oxide emissions and 27.5 percent of other particulate emissions from mobile sources in the United States. The *Mobility 2001* report states that freight trains also contribute to emissions of hydrocarbons, carbon monoxide, and nitrous oxide, although generally at levels considerably lower than trucks. In addition, while large shipping vessels are more energy efficient than trucks or trains, they are also major sources of nitrogen, sulfur dioxide, and diesel particulate emissions. According to the International Maritime Organization, ocean shipping is responsible for 22 percent of the wastes dumped into the sea on an annual basis.

Three Strategies for Addressing Mobility Challenges

The experts we consulted presented numerous approaches for addressing the types of challenges discussed throughout this statement, but they emphasized that no single strategy would be sufficient. From these discussions and our literature review, we have identified three key strategies that may help transportation decisionmakers at all levels of government address mobility challenges and the institutional barriers that contribute to them. The strategies include (1) focusing on systemwide outcomes, (2) using a full range of techniques, and (3) providing options for financing surface and maritime transportation.

²² See U.S. General Accounting Office, *Environmental Protection: Federal Incentives Could Help Promote Land Use That Protects Air and Water Quality*, [GAO-02-12](#) (Washington, D.C., Oct. 31, 2001).

Focus on the Entire Surface and Maritime Transportation System Rather Than on Specific Modes or Types of Travel to Achieve Desired Mobility Outcomes.

Shifting the focus of government transportation agencies at the federal, state, and local levels to consider all modes and types of travel in addressing mobility challenges—as opposed to focusing on a specific mode or type of travel in planning and implementing mobility improvements—could help achieve enhanced mobility. Addressing the types of mobility challenges discussed earlier in this statement can require a scope beyond a local jurisdiction, state line, or one mode or type of travel. For example, congestion challenges often occur where modes connect or should connect—such as ports or freight hubs where freight is transferred from one mode to another, or airports that passengers need to access by car, bus, or rail. These connections require coordination of more than one mode of transportation and cooperation among multiple transportation providers and planners, such as port authorities, metropolitan planning organizations (MPO),²³ and private freight railroads. Therefore, a systemwide approach to transportation planning and funding, as opposed to focus on a single mode or type of travel, could improve focus on outcomes related to user or community needs. The experts we consulted provided a number of examples of alternative transportation planning and funding systems that might better focus on outcomes that users and communities desire, including the following:

- **Performance-oriented funding system.** The federal government would first define certain national interests of the transportation system—such as maintaining the entire interstate highway system or identifying freight corridors of importance to the national economy—then set national performance standards for those systems that states and localities must meet. Federal funds would be distributed to those entities that address national interests and meet the established standards. Any federal funds remaining after meeting the performance standards could then be used for whatever transportation purpose the state or locality deems most appropriate to achieve state or local mobility goals.
- **Federal financial reward-based system.** Federal support would reward those states or localities that apply federal money to gain efficiencies in their transportation systems, or tie transportation projects to land use and other local policies to achieve community and environmental goals, as well as mobility goals.

²³ MPOs are organizations of city, county, state, and federal officials that provide a regional forum for transportation planning.

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- **System with different federal matching criteria for different types of expenditures that might reflect federal priorities.** For example, if infrastructure preservation became a higher national priority than building new capacity, matching requirements could be changed to a 50 percent federal share for building new physical capacity and an 80 percent federal share for preservation.
 - **System in which state and local governments pay for a larger share of transportation projects, which might provide them with incentives to invest in more cost-effective projects.** Reducing the federal match for projects in all modes may give states and localities more fiscal responsibility for projects they are planning. If cost savings resulted, these entities might have more funds available to address other mobility challenges. Making federal matching requirements equal for all modes may avoid creating incentives to pursue projects in one mode that might be less effective than projects in other modes.

In addition, we recently reported on the need to view various transportation modes, and freight movement in particular, from an integrated standpoint, particularly for the purposes of developing a federal investment strategy and considering alternative funding approaches.²⁴ We identified four key components of a systematic framework to guide transportation investment decisions including (1) establishing national goals for the system, (2) clearly defining the federal role relative to other stakeholders, (3) determining the funding tools and other approaches that will maximize the impact of any federal investment, and (4) ensuring that a process is in place for evaluating performance and accountability.

Use a Full Range of Techniques to Address Mobility Challenges

Using a range of techniques to address mobility challenges may help control congestion and improve access. This approach involves a strategic mix of construction, corrective and preventive maintenance, rehabilitation, operations and system management, and managing system use through pricing or other techniques. No one type of technique would be sufficient to address mobility challenges. Although these techniques are currently in use, the experts we consulted indicated that planners should more consistently consider a full range of techniques, as follows:

²⁴ [GAO-02-1033](#).

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- **Build new infrastructure.** Building additional infrastructure is perhaps the most familiar technique for addressing congestion and improving access to surface and maritime transportation. Although there is a lot of unused capacity in the transportation system, certain bottlenecks and key corridors require new infrastructure.
 - **Increase infrastructure maintenance and rehabilitation.** An emphasis on enhancing capacity from existing infrastructure through increased corrective and preventive maintenance and rehabilitation is an important supplement to, and sometimes a substitute for, building new infrastructure. Maintaining and rehabilitating transportation systems can improve the speed and reliability of passenger and freight travel, thereby optimizing capital investments.
 - **Improve management and operations.** Better management and operation of existing surface and maritime transportation infrastructure is another technique for enhancing mobility because it may allow the existing transportation system to accommodate additional travel without having to add new infrastructure. For example, the Texas Transportation Institute reported that coordinating traffic signal timing with changing traffic conditions could improve flow on congested roadways. One panelist noted that shifting the focus of transportation planning from building capital facilities to an “operations mindset” will require a cultural shift in many transportation institutions, particularly in the public sector, so that the organizational structure, hierarchy, and rewards and incentives are all focused on improving transportation management and operations.²⁵
 - **Increase investment in technology.** Increasing public sector investment in Intelligent Transportation System (ITS) technologies that are designed to enhance the safety, efficiency, and effectiveness of the transportation network, can serve as a way of increasing capacity and mobility without making major capital investments. ITS includes technologies that improve traffic flow by adjusting signals, facilitating traffic flow at toll plazas, alerting emergency management services to the locations of crashes, increasing the efficiency of transit fare payment systems, and other actions. Other technological improvements include increasing information available to users of the transportation system to

²⁵ Joseph M. Sussman, “Transitions in the World of Transportation: A Systems View,” *Transportation Quarterly* 56 (2002): 21-22.

help people avoid congested areas and to improve customer satisfaction with the system.

- **Use demand management techniques.** Another approach to reducing congestion without making major capital investments is to use demand management techniques to reduce the number of vehicles traveling at the most congested times and on the most congested routes. One type of demand management for travel on public roads is to make greater use of pricing incentives. In particular, some economists have proposed using congestion pricing that involves charging surcharges or tolls to drivers who choose to travel during peak periods when their use of the roads increases congestion. These surcharges might help reduce congestion by providing incentives for travelers to share rides, use transit, travel at less congested (generally off-peak) times and on less congested routes, or make other adjustments—and at the same time, generate more revenues that can be targeted to alleviating congestion in those specific corridors.

In addition to pricing incentives, other demand management techniques that encourage ride-sharing may be useful in reducing congestion. Ride-sharing can be encouraged by establishing carpool and vanpool staging areas, providing free or preferred parking for carpools and vanpools, subsidizing transit fares, and designating certain highway lanes as high occupancy vehicle (HOV) lanes that can only be used by vehicles with a specified number of people in them (i.e., two or more).

Demand management techniques on roads, particularly those involving pricing, often provoke strong political opposition. The panelists cited a number of concerns about pricing strategies including (1) the difficulty in instituting charges to use roads that previously had been available “free”, (2) the equity issues that arise from the potentially regressive nature of these charges (i.e., the surcharges constitute a larger portion of the earnings of lower income households and therefore impose a greater financial burden on them), and (3) the concern that restricting lanes or roads to people who pay to use them is elitist because that approach allows people who can afford to pay the tolls to avoid congestion that others must endure.

Provide Options for Financing Mobility Improvements and Consider Additional Sources of Revenue

More options for financing surface and maritime transportation projects and more sources of revenue may be needed to achieve desired mobility outcomes and address those segments of transportation systems that are most congested. Our panelists suggested three financing strategies:

- **Increase funding flexibility.** The current system of financing surface and maritime transportation projects limits options for addressing mobility challenges. For example, separate funding for each mode at the federal, state, and local level can make it difficult to consider possible efficient and effective ways for enhancing mobility. Providing more flexibility in funding across modes could help address this limitation.
- **Expand support for alternative financing mechanisms.** The public sector could also expand its financial support for alternative financing mechanisms to access new sources of capital and stimulate additional investment in surface and maritime transportation infrastructure. These mechanisms include both newly emerging and existing financing techniques such as providing credit assistance to state and local governments for capital projects and using tax policy to provide incentives to the private sector for investing in surface and maritime transportation infrastructure. These mechanisms currently provide a small portion of the total funding that is needed for capital investment and some of them could create future funding difficulties for state and local agencies because they involve greater borrowing from the private sector.²⁶
- **Consider new revenue sources.** A possible future shortage of revenues may limit efforts to address mobility challenges, according to many of the panelists. For example, some panelists said that because of the increasing use of alternative fuels, revenues from the gas tax are expected to decrease, possibly limiting funds available to finance future transportation projects.

One method of raising revenue is for counties and other regional authorities to impose sales taxes for funding transportation projects. A number of counties have already passed such taxes and more are being considered nationwide. However, several panelists expressed concerns that this method might not be the best option for addressing mobility

²⁶ See U.S. General Accounting Office, *Transportation Infrastructure: Alternative Financing Mechanisms for Surface Transportation*, [GAO-02-1126T](#) (Washington, D.C.: Sept. 25, 2002).

challenges because (1) moving away from transportation user charges to sales taxes that are not directly tied to the use of transportation systems weakens the ties between transportation planning and finance and (2) counties and other taxing authorities may be able to bypass traditional state and metropolitan planning processes because sales taxes provide them with their own funding sources for transportation.

New or increased taxes or other fees imposed on the freight sector could also help fund mobility improvements, for example, by increasing taxes on freight trucking. The Joint Committee on Taxation estimated that raising the ceiling on the tax paid by heavy vehicles to \$1,900 could generate about \$100 million per year.²⁷ Another revenue raising method would be to dedicate more of the revenues from taxes on alternative fuels, such as gasohol, to the Highway Trust Fund rather than to Treasury's general fund, as currently happens. However, this would decrease the amount of funds available for other federal programs. Finally, pricing strategies, mentioned earlier in this statement as a technique to reduce congestion, are also possible additional sources of revenue for transportation purposes.

In summary, the nation faces significant challenges in maintaining and enhancing mobility on its surface and maritime transportation systems, particularly with the growing congestion that accompanies increased passenger and freight travel. However, as the Congress considers reauthorizing surface transportation legislation—and weighs the structure, nature, and level of federal investment it will provide in future years to support surface and other transportation activities—it has an opportunity to consider new strategies for dealing with congestion and promoting enhanced mobility. While no single approach is sufficient, the key strategies that we have outlined today may help transportation decisionmakers at all levels of government address mobility challenges and the institutional barriers that contribute to them.

Mr. Chairman, this concludes my prepared statement. I would be pleased to respond to any questions you or other Members of the Committee may have at this time.

²⁷See U.S. General Accounting Office, *Highway Financing: Factors Affecting Highway Trust Fund Revenues*, [GAO-02-667T](#) (Washington, D.C., May 9, 2002).

Contacts and Acknowledgments

For further information on this testimony, please contact JayEtta Z. Hecker at (202) 512-2834 or heckerj@gao.gov. Individuals making key contributions to this testimony include Christine Bonham, Jay Cherlow, Colin Fallon, Rita Grieco, David Hooper, Jessica Lucas, Sara Ann Moessbauer, Jobenia Odum, Katherine Siggerud, and Andrew VonAh.

Appendix I: Scope and Methodology

Our work covered major modes of surface and maritime transportation for passengers and freight, including public roads, public transit, railways, and ports and inland waterways. To identify mobility challenges and strategies for addressing those challenges, we primarily relied upon expert opinion, as well as a review of pertinent literature. In particular, we convened two panels of surface and maritime transportation experts to identify mobility issues and gather views about alternative strategies for addressing the issues and challenges to implementing those strategies. We contracted with the National Academy of Sciences (NAS) and its Transportation Research Board (TRB) to provide technical assistance in identifying and scheduling the two panels that were held on April 1 and 3, 2002. TRB officials selected a total of 22 panelists with input from us, including a cross-section of representatives from all surface and maritime modes and from various occupations involved in transportation planning. In keeping with NAS policy, the panelists were invited to provide their individual views and the panels were not designed to build consensus on any of the issues discussed. We analyzed the content of all of the comments made by the panelists to identify common themes about key mobility challenges and strategies for addressing those challenges. Where applicable, we also identified the opposing points of view about the strategies.

The names and affiliations of the panelists are as follows. We also note that two of the panelists served as moderators for the sessions, Dr. Joseph M. Sussman of the Massachusetts Institute of Technology and Dr. Damian J. Kulash of the Eno Foundation, Inc.

- Benjamin J. Allen is Interim Vice President for External Affairs and Distinguished Professor of Business at Iowa State University.
- Daniel Brand is Vice President of Charles River Associates, Inc., in Boston, Mass.
- Jon E. Burkhardt is the Senior Study Director at Westat, Inc., in Rockville, Md.
- Sarah C. Campbell is the President of TransManagement, Inc., in Washington, D.C.
- Christina S. Casgar is the Executive Director of the Foundation for Intermodal Research and Education in Greenbelt, Md.
- Anthony Downs is a Senior Fellow at the Brookings Institution.

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- Thomas R. Hickey served until recently as the General Manager of the Port Authority Transit Corporation in Lindenwold, N.J.
 - Ronald F. Kirby is the Director of Transportation Planning at the Metropolitan Washington Council of Governments.
 - Damian J. Kulash is the President and Chief Executive Officer of the Eno Transportation Foundation, Inc., in Washington, D.C.
 - Charles A. Lave is a Professor of Economics (Emeritus) at the University of California, Irvine where he served as Chair of the Economics Department.
 - Stephen Lockwood is Vice President of Parsons Corporation, an international firm that provides transportation planning, design, construction, engineering, and project management services.
 - Timothy J. Lomax is a Research Engineer at the Texas Transportation Institute at Texas A&M University.
 - James R. McCarville is the Executive Director of the Port of Pittsburgh Commission.
 - James W. McClellan is Senior Vice President for Strategic Planning at the Norfolk Southern Corporation in Norfolk, Va.
 - Michael D. Meyer is a Professor in the School of Civil and Environmental Engineering at the Georgia Institute of Technology and was the Chair of the school from 1995 to 2000.
 - William W. Millar is President of the American Public Transportation Association (APTA).
 - Alan E. Pisarski is an independent transportation consultant in Falls Church, Va., providing services to public and private sector clients in the United States and abroad in the areas of transport policy, travel behavior, and data analysis and development.
 - Craig E. Philip is President and Chief Executive Officer of the Ingram Barge Company in Nashville, Tenn.

-
- Arlee T. Reno is a consultant with Cambridge Systematics in Washington, D.C.
 - Joseph M. Sussman is the JR East Professor in the Department of Civil and Environmental Engineering and the Engineering Systems Division at the Massachusetts Institute of Technology.
 - Louis S. Thompson is a Railways Advisor for the World Bank where he consults on all of the Bank's railway lending activities.
 - Martin Wachs is the Director of the Institute of Transportation Studies at the University of California, Berkeley and he holds faculty appointments in the departments of City and Regional Planning and Civil and Environmental Engineering at the university.

Appendix II: Related GAO Products

Transportation Infrastructure: Alternative Financing Mechanisms for Surface Transportation. [GAO-02-1126T](#). Washington, D.C.: September 25, 2002.

Highway Infrastructure: Preliminary Information on the Timely Completion of Highway Construction Projects. [GAO-02-1067T](#). Washington, D.C.: September 19, 2002.

Marine Transportation: Federal Financing and a Framework for Infrastructure Investments. [GAO-02-1033](#). Washington, D.C.: September 9, 2002.

Surface and Maritime Transportation: Developing Strategies for Enhancing Mobility: A National Challenge. [GAO-02-775](#). Washington, D.C.: August 30, 2002.

Highway Infrastructure: Interstate Physical Conditions Have Improved, but Congestion and Other Pressures Continue. [GAO-02-571](#). Washington, D.C.: May 31, 2002.

Highway Financing: Factors Affecting Highway Trust Fund Revenues. [GAO-02-667T](#). Washington, D.C.: May 9, 2002.

Transportation Infrastructure: Cost and Oversight Issues on Major Highway and Bridge Projects. [GAO-02-702T](#). Washington, D.C.: May 1, 2002.

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**Economy, Community, and Law: The Turnpike
Movement in New York, 1797-1845**

Daniel B. Klein

John Majewski

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Daniel B. Klein

John Majewski

Turnpikes promised a solution to the problem of bad roads, but private management of highways was a startling innovation. Some people opposed the idea of turnpikes as exemplifying two *bêtes noires* of the post-Revolutionary period, the “private corporation” and “aristocracy.” Much of the controversy, however, was rooted in local disputes over legislative concessions to turnpike protesters. The legislature both expressed and responded to turnpike protest by writing laws favorable to local users and injurious to the financial viability of the companies. Partly in consequence, the turnpikes were unprofitable. Landowners, merchants, and farmers struggled to finance turnpikes, not so much in hopes of company dividends but in hopes of improved transportation, stimulated commerce, and higher land values. Many turnpike projects failed to be constructed, and those that were constructed carried on in a condition that reflected their precarious financial state.

If stockholders and the legal authorization to pay dividends define the business corporation, then the business corporation underwent great change during the 19th century. By the end of the century, business incorporation was understood to be a freely available device by which private individuals could pursue their private interests. At the beginning of the century neither was the corporate form freely available nor was the desire for profit adequate cause, or even the primary cause, for granting a corporate charter. What’s more, “[t]he purposes of the individual investors,” as economic historian Carter Goodrich (1948:306) observed, “were by no means always confined to the expectation of direct return on their investment,” and to

Cartography: Christopher Baer, Hagley Museum and Library, Wilmington, Delaware.

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modern eyes a disproportionate share of the aggregate stock in the early corporations was unprofitable. At its origin, say Oscar and Mary Handlin (1945:22; cf. Hurst 1970:15), "the corporation was conceived as an agency of government, endowed with public attributes, exclusive privileges, and political power, and designed to serve a social function for the state. Turnpikes, not trade, banks, not land speculation, were its province because the community, not the enterprising capitalists, marked out its sphere of activity." But how did the community mark out the corporation's sphere of activity? What restrained the enterprising capitalists from using the corporate form toward more rapacious ends? And what attracted investors in spite of the community's claim on turnpikes?

Turnpikes are indeed a good place to look for answers. In New York, between 1800 and 1830, one third of all business incorporations were for turnpikes (the share goes up to 43% if you exclude companies organized under the general manufacturing law of 1811). Throughout the Northeast, turnpikes were the leading type of business incorporation (Table 1). And no other type of business corporation was more embedded in the community, both figuratively and literally. Compared to a canal or railroad the turnpike offered easy access—too much so, in the eyes of gatekeepers—and any sort of private vehicle could make use of the route. All manner of business would bring people on the turnpike, which may have been laid over a former highway or even over the traveler's land. If laid over a former public highway, the turnpike may not even have been seen as providing a service discretely new and different from what had been enjoyed prior to its formation.

Table 1. Turnpikes as a Percentage of All Business Incorporations, by Special and General Acts, 1800-1830

State	All Incorporations	Turnpike Incorporations	% Turnpikes of All Incorporations
New York	993	339	34
Pennsylvania	428	199	46
New Jersey	190	47	25
Maryland	194	54	28
Connecticut	234	77	33
Rhode Island	127	34	27
Massachusetts & Maine	880	104	12
New Hampshire	304	51	17
Vermont	177	41	23
Total	3,527	946	27

SOURCE: For all states through 1800, Davis 1948:vol. 2, 22-27, 216; for New Hampshire, Vermont, Massachusetts, and Rhode Island, Taylor 1934:339-44, 346; for Connecticut, *ibid.*, pp. 338-39, and Reed 1964:75; for New York, New Jersey, and Maryland, Evans 1948:12-17; for Pennsylvania, Miller 1940:158-59.

The turnpike shared another feature of many early corporations—unprofitability. By 1810 or so turnpike stock had become notorious as an unremunerative asset. Hence, when subscriptions had to be filled to bring improved roadway to the community, more than plain investment incentives had to be brought to bear on potential contributors. The stick of the community would try to supplement the puny carrot of profit.

In our story of the New York turnpike movement, turnpike opposition and protest play a significant role. Not only were objections raised, but they were politically effective. Protest elicited legal restraints that hamstrung turnpikes. Thus the passage from the Handlins raises another matter: Did the ways in which “the community, not the enterprising capitalists,” came to mark out the corporation’s sphere of activity in fact best serve the community? In the tug of war between the community (protesters) and enterprising capitalists (turnpike supporters), would the material benefits have been greater for all classes if the legislature had awarded more ground to the enterprising capitalists? We suggest that the New York legislature was too sensitive and too accommodating toward turnpike protesters.¹

Among the studies of law and government policy in the early republic we may identify, in summary fashion, three schools. The Progressive historians, notably Charles Beard, found law and government policy as arenas of class conflict, with Jefferson and Jackson representing the common man in battles against the privileged and powerful (see Wilentz 1982). Consensus historians found an America rather free of class struggle, populated by go-getters who sought to use law and state government to promote their entrepreneurial interests. The leading representatives of this school are the Commonwealth scholars (Handlin & Handlin 1947; Hartz 1948, 1955; Heath 1954; Taylor 1977 [1951]; on internal improvements, see Lively 1955). A third school is made up of leftist historians who renew Progressive themes of class conflict but focus on the details of institutional settings of social, legal, and economic interaction. They often find the affluent and powerful oppressing the poor and powerless, who resisted the transformation to

¹ For the early history of the corporation, New York’s experience with turnpikes rises in importance since it was the state with the most turnpikes. For research, however, New York is among the most frustrating. Appendix 1 describes the variety of the sources on turnpikes in New York.

The secondary literature on the toll roads of the 19th century is rather sparse. Durrenberger (1931) remains the most cited work. The work is pleasant and fruitful reading but brief and somewhat nostalgic in style. The New England turnpikes were catalogued by Wood (1919) and given an excellent general treatment in P. Taylor (1934); see also G. R. Taylor (1977 [1951]), Parks (1966), and Reed (1964). The most satisfactory state study is Hunter (1957) on Virginia, out of which came two journal articles. Jones (1990) offers a valuable Rhode Island study paralleling this one in some respects.

an acquisitive and commercial society (Horwitz 1977; Henretta 1978; Prude 1983; Clark 1990).

To use a distinction made by J. H. Hexter (1979:241–42), our story of turnpikes plays the rascal known as the “splitter,” who complicates and upsets the courageous efforts of the “lumpers” to impose order on the past. Contrary to Horwitz and several social historians, we cast doubt on the proposition that protest was class-based. Although anticommercial ideology played a role in general opposition to turnpikes, we interpret local protest largely as an opportunistic means to acquiring concession for local users. In this respect, the turnpike episode fits well with the views of Consensus historians, among them Louis Hartz.² Furthermore, whereas Horwitz (1977:xv, 253–54) and others suggest that the noncommercial interests were forsaken, we show that the protesters were not powerless. Protesters were often successful in getting the legal authorities to satisfy their demands. But their victories were a social bad as often as they were a social good, in that legal concessions significantly hindered the construction and upkeep of many turnpikes. In line with Horwitz and Hurst (1956:3–4), we find turnpike legislation serving to release productive energy, but we qualify this point by showing that the release was more limited than it might have been.³

I. Why Turnpikes? Why Then?

To American fortune seekers, the ratification of the Constitution was like the “bang” of a starting gun. The Constitution built an interstate framework for financial, legal, and political affairs (Hurst 1956:10; North 1966:50–51), signaling to anticipative runners that a race was afoot—a race to capture the trade of the interior, to develop western lands, to expand population, to build the leading entrepôt. During the 1790s the steamboat was still in an experimental phase, canal construction was hard to finance and limited in scope, and railroads were yet to be spoken of. Better transportation meant, above all, better highways.

The Town System of Road Care

In basic structure, local road care in New York remained nearly constant throughout the colonial period and well into the 19th century. That structure is depicted in Figure 1.

² E.g., Hartz (1948) demonstrates that considerable interest group struggle influenced the Pennsylvania legislature, but the groups were primarily regional, not class-based. In this sense Hartz, like us, sees much opportunism in the protest that existed.

³ Horwitz argues the pro-development tendencies of the judiciary, whereas our focus is the legislature.

Although the town highway commissioners are shown as second in command, they had most of the responsibility and authority for local road management—hence the capital letters. The tier above the commissioners was often shifting and finding new definition, as county configuration was changing almost yearly.

County officials lend guidance now and then

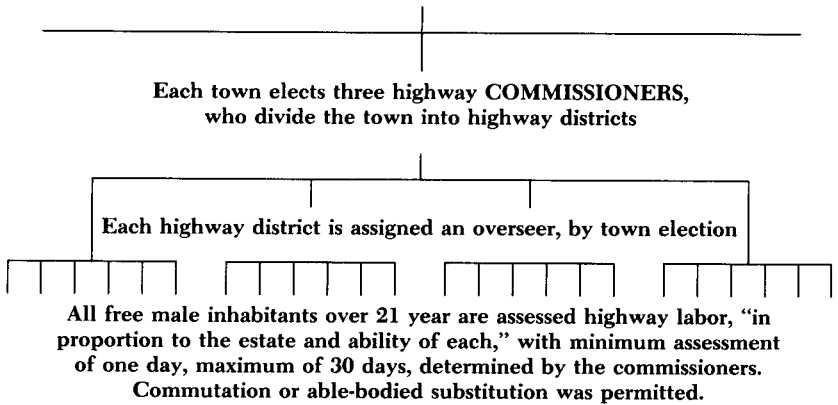


Figure 1. Town Management of Roads in New York, circa 1800.

The general highway law in 1801 determined many details that would last for decades.⁴ Eligible men in the town were assessed an average of at least three days of road work. The inhabitants could commute this assessment at 62.5 cents per day. Whether a substitute could be persuaded to take one's place at a lower rate we do not know.⁵ The teeth of the system lay in the fines. At virtually every step of the program a fine was specified for failing to carry out a task, including a fine of \$10 against the overseer for failure to collect fines from the laborers. Should anyone fail to appear or "remain idle or not work faithfully, or hinder others from working," the fine was \$1, which applied pro rata for fractional offenses. Scant evidence indicates that the fines were effective in getting people to work the roads. In his study of Beekmantown, New York, White (1979:198–99) finds that labor assessments generally were fulfilled.

⁴ The 1801 general highway law is much like the 1797 law, except that it downplays the role of the county superintendents of highways.

⁵ Other matters addressed included the assessment of animals and equipment to be used in road work, the assessment of newcomers to the town, remedies for insufficient assessments having been made, the coordination with other towns for intertown connections, the laying out of new roads and procedures for determining damages, prohibitions against obstruction and maltreatment of roads, and various details on matters of fallen trees, guideposts and milestones, and swinging gates on roads that traversed someone's pasture. Labor assessments could be augmented by up to one-third the original assessment and a levy of up to \$250 from the inhabitants was permitted. 1801 N.Y. Laws ch. 186, secs. VII & XXIII.

Although residents throughout New York, like those in Beekmantown, may have fulfilled their basic obligations, there was no difference of opinion about the ineffectiveness of the local road care system. In 1796 Governor John Jay spoke of the need to make the road laws "more effectual." For decades the system remained the butt of invective. Governor Throop said in 1832 that the road tax is "generally looked upon as a burthen, and is worked out with as little fidelity in labor, or regard to time, as the laws and indulgent overseers will permit." Two years later Governor Marcy echoed these remarks (Lincoln 1909:vol. 2, 385; vol. 3, 376, 468). A report on roads undertaken for the 1836 New York Internal Improvements Convention said "the public roads in this state have not visibly improved for years. . . . No epithet, however strong, can properly characterize their wretched state."⁶

The ineffectiveness is not hard to understand. As with public works of any kind, incentives were weak because the chain of activity could not be traced to a residual claimant. The laborers were brought together in a transitory, disconnected manner, preventing them from developing the appropriate skills and pride in the job. As the Handlins (1947:118) say of the similar system in Massachusetts: "It was one thing to vote assessments in town meeting and another to get farmers to sweat out their shares." Since overseers and laborers were commonly farmers, too often the crop schedule, rather than road deterioration, dictated the repairs schedule. Except in cases of special appropriations, financing came in dribbles deriving mostly from the fines and commutations of the assessed inhabitants. Commissioners could hardly lay plans for decisive improvements. When a needed connection passed through unsettled lands, it was difficult to mobilize labor because assessments could be worked out only in the district in which the laborer resided. Because work areas were divided into districts, as well as into towns, problems arose because the various pieces were not working together.

Knowing that the local road system was incapable of providing roads in sparsely settled areas, lawmakers cast about for alternative in road management. In 1790 the state allocated 1,000 pounds to the land office to lay out roads and authorized another 400 pounds in 1791.⁷ In 1792 the state took the more

⁶ J. Blunt (Chairman), "Report on Roads," p. 1, presented at the Internal Improvements Convention, 1836 (bound with item 385 N559 at New York State Library); cf. Taylor 1977 [1951]:16.

⁷ New York State appropriation for highways, 13th sess., ch. 53 (1790); 14th sess., ch. 53 (1791). Much of the money was to go to road building between the Susquehanna and Hudson rivers.

For the period covered in this article New York statutes regarding highway appropriations and matters relating to toll bridges and turnpikes (including charters, land acquisition, maintenance, location/relocation, shunpiking, and rates) are cited in text

decisive step of dividing the state into four districts and making appropriations amounting to 20,000 pounds.⁸ In 1797 (20th sess., ch. 60) and 1803 (26th sess., ch. 59) the state authorized lotteries to raise \$45,000 and \$41,000, and the state continued to invest in road building well into the turnpike era. It is hard to say whether these state efforts piggybacked on the local system or operated parallel to it.⁹

Historians have suggested that a feeling of futility suffused the road care system. Joseph Durrenberger (1931:29) goes so far as to say: "Under this policy of making only temporary repairs the labor and money devoted to highways were largely thrown away." The state lacked the funds and administration to improve matters significantly. The idea of a turnpike company, with responsibility, authority, and financing for the entire route under a board of directors, held out great promise of remedy, and at a time when remedy was urgently needed.

Regional Rivalry and the Onward Spirit

The need to upgrade road care was strong in the 1790s. A stimulus was competition with other states. The most dramatic competition in the state concerned the sparsely settled areas west of the Hudson Valley. Would trade from these counties flow southward through Pennsylvania on the waters of the Susquehanna and the Delaware? Or would dependable overland routes connect these counties to the waters of the Mohawk and the Hudson? Another focus of state rivalry was the east bank of the Hudson, as turnpike roads in Connecticut and Massachusetts were drawing trade eastward into New England.

Turnpike promoters in New York seized upon the spirit of rivalry. Elkanah Watson, a life-long enthusiast for improvements of many kinds, was the state's shrewdest and most active voice for turnpikes, although he never held public office. Between 1795 and 1805 he wrote a dozen substantive newspaper articles on turnpikes, including two debates with turnpike critics, as well as many shorter pieces.¹⁰ All are pasted into his *Commonplace Book*, where he often scribbled messages along-

and notes only by legislative session, chapter, and year. All may be found in the appropriate year in N.Y. Laws.

⁸ New York appropriation for highways, 15th sess., ch. 60 (1792). Each district was to be supervised by named commissioners, and work was to be done by contract whenever possible.

⁹ Plummer (1925:45-46) makes such a distinction in discussing road policy in Pennsylvania. As with turnpike chartering, Pennsylvania outflanked New York in state road building. Its first authorization for state road building was in 1785, and its first lottery for road building was authorized in 1782; *ibid.*, pp. 43-44, 26-27.

¹⁰ Watson's scrapbook (his "Commonplace Book") is a juicy source of contemporary debate and rhetoric. Elkanah Watson, *Commonplace Book* (manuscript scrapbook, Watson Collection, New York State Library). Watson never used his real name. For more on Watson see Lord (1942).

side the clippings. In nearly every article Watson alludes to the “enlightened” exertions of other states, “ever jealous of our progress and competition with them.” In one case he quotes at length a speech from 1796 of Pennsylvania Governor Mifflin that described how Pennsylvania’s actions have “excited in one of our sister states [New York] . . . an emulation so active as to demand” further improvements from the Pennsylvania legislature. Watson warned his fellow New Yorkers that Pennsylvania is “extending turnpike roads, up to our very borders,” with “a steady eye fixed on the trade of our Western counties.” “Most fortunately,” he disingenuously exclaimed in 1801, “we are awake: the spirit of turnpikes has generally diffused itself, and the most effectual counter-current to their views will be to branch out turnpike roads from the [Hudson] river.” At Watson’s behest, a newspaper printed a “letter from a gentleman travelling in the Western counties,” which dwells on how the “race of competition between the Commercial Cities of this State on the one side, and Philadelphia and Baltimore on the other, cannot fail [to be] of infinite importance to our Western Counties, who are the immediate objects of this competition” (Commonplace Book, 41, 43, 45).

Benjamin De Witt wrote a well-circulated article in 1807 that described the progress of turnpikes in New York. The author exclaimed that “every State may be considered, in relation to matters of this kind, as a distinct country and people.” He expressed his hope that his summary report would be useful to the legislature, although “it may have a tendency to excite emulation of our sister States,” and concluded by expressing his hope that through turnpike construction New York would attract more of the trade of New Jersey, Pennsylvania, Connecticut, Massachusetts, and Vermont.¹¹ Official documents also show the preoccupation with competition between states.¹² A striking case is in the *Assembly Journal* (1808:91), where a committee supporting a petition asking for a turnpike charter notes with alarm that “wealthy and influential citizens in Pennsylvania, aware of the local advantages of our state, are exerting themselves with zeal . . . to turn . . . the produce of our western country, to the Philadelphia market, by opening different turnpike roads, between the Delaware and Susquehannah rivers,

¹¹ De Witt’s article was included in U.S. Treasurer Albert Gallatin’s 1808 report on canals and roads to President Jefferson. De Witt counts as built some turnpikes that were not in fact built at the time.

¹² New York State legislative journals and compilations of documents cited here are identified by year and page number. The four sources are New York Legislature, Assembly, *Journal of the Assembly of the State of New York* (“Assembly Journal”); New York Legislature, Assembly, *Documents of the Assembly of the State of New York* (“Assembly Doc.”); New York Legislature, Senate, *Journal of the Senate of the State of New York* (“Sen. Journal”); New York Legislature, Senate, *Documents of the Senate of the State of New York* (“Sen. Doc.”).

and the line of this state.” The proposed turnpike “promises to [make] the city of New York, . . . by means of the villages on the Hudson, . . . a successful competitor with other cities in the union, for supplying Pittsburgh, and other places on the Ohio and Mississippi rivers, with goods and merchandize.”

If state rivalry was a rallying point for legislative approval of turnpiking, it was *local* rivalry, pitting New Yorker against New Yorker, that fired the wills of those seeking turnpike charters. Here again Watson stoked the restless souls of New Yorkers, especially the people of Albany. To animate support for a turnpike between Albany and Waterford to the north, Watson asked if there was any man “so blind” as not to feel the need of Albany to be “on a fair footing of competition for . . . the Northern trade with Lansingburgh and Troy, who, by most laudable efforts, are endeavoring to monopolize” that trade. “If we cannot divert, we can at least divide with them this important growing commerce” (Commonplace Book, 46).

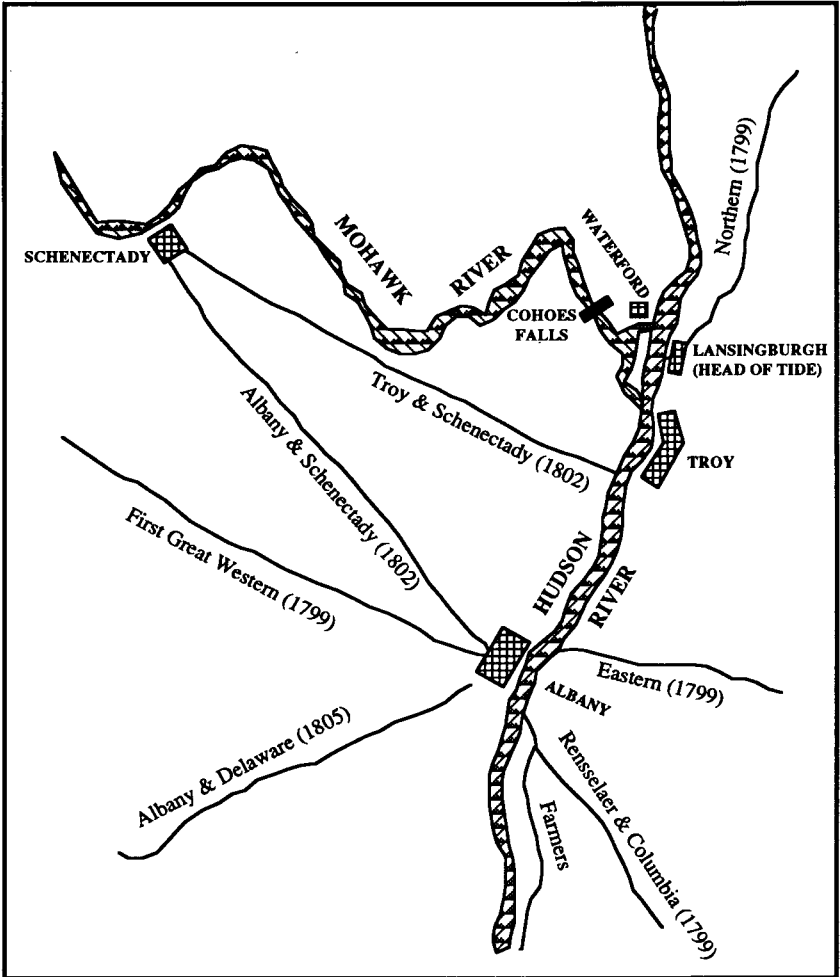
Watson’s master stroke is told of in an unpublished diary of a man named Jones who knew Watson.¹³ Albany and Troy were beginning a bitter commercial rivalry (Map 1).¹⁴ In the late 1790s the organizer of a turnpike between Albany and Schenectady despaired to Watson about the failure to interest investors in the project. Watson told the organizer “to hold himself in readings to take advantage of what might occur.” The Jones 1821 (p. 22) diary entry continues,

A few days after there appeared in one of the Troy newspapers a communication adressed [*sic*] to the People of that place pointing out to them the great benefits which would accrue to them from the Western trade and urging them . . . to build a turnpike road from Schenectady to Troy. No sooner did this piece appear than the Albany folks took the alarm.

Watson’s Troy article and his follow-up published in an Albany newspaper are both pasted in his scrapbook. The Troy article speaks of diverting the western trade “from Albany to this place.” In the follow-up, addressed to the people of Albany, Watson warns of the plans of the “persevering and enterprising Trojans”: “when we see and feel the effects of rivals, constantly rising to divert [trade] from this natural emporium, . . . [with the] competitor under our very noses, and within sight of our city, surely we must awake from our dreams of security.” Beneath this article in his scrapbook Watson scribbled gleefully, “the above was a . . . publication before the Trojans dreamt of a

¹³ Jones Diary, unpublished type copy, Schenectady County (NY) Historical Society, 1821.

¹⁴ In 1788 Watson presciently wrote of the rise of the new town of Troy (then called Vanderhyden) and predicted its eclipsing of Lansingburgh (then called New City); see Watson 1856:276. On the contest between Albany and Troy, especially in the railroad days, see Ellis 1943.



Map 1. Albany-area (NY) turnpikes chartered by 1805. Construction usually lagged several years behind the charter dates (shown in parentheses).

Turnpike—it awakened the Jealousy of the Albanyans—and the next year produced the Schenectady Turnpike Association” (Commonplace Book, 37, 38). As the Jones diary account accurately finishes, “the Stock was apportioned between the inhabitants of Albany and Schenectady . . . and the present road was built.”

The incident illustrates the deeply rooted anxiety and rivalry that consumed localities. The restless quality of Americans was well noted by foreign visitors, as when Michel Chevalier wrote: “An American is always on the lookout lest any of his neighbors should get the start of him. If one hundred Americans were going to be shot, they would contend for first

place.”¹⁵ New Yorkers were immersed in the effort to build and grow wealthy, and improved transportation figured prominently in their plans. In this period of rapid settlement, small advantages at the start could indeed decide eminence in the future.¹⁶ Simply “sitting out” of the commotion was not a viable option for a town, because the forwardness of neighboring towns would imply, both psychologically and materially, a retrogression.¹⁷ To some extent improvement boosterism was, like cola advertising today, combative rather than developmental.¹⁸

A Legal and Organizational Innovation

In spite of the growing interstate and local commercial rivalry, the earliest public attitude toward turnpikes was reluctance, if not resistance. In November 1796 Watson scribbled in his scrapbook (p. 29): “I have laboured a Long time to bring forward Turnpikes in this State—without any success—the current of public mind begins to be in favour of the Object.” The data in Table 2 come from Davis (1917:vol. 2, 216) showing that, except for New Jersey, New York was the last of the eastern states to try the turnpike idea. In toll-bridge chartering, which began about five years earlier than turnpike chartering, New York was dead last, chartering its first in 1797 (*ibid.*, p. 188). Although some of the most important New York turnpikes were chartered by 1800, none were completed by then. New York’s full adoption of the turnpike plan came only with its 1807 general turnpike law.

The turnpike idea was an old one. Britain first authorized a toll road in 1663, with “turnpike mania” prevailing in Britain from about 1750 to 1772 (Pawson 1977:151). The British turnpikes were organized as trusts—not-for-profit organizations fi-

¹⁵ Here Chevalier (1961 [1836]:271) is quoting “a man of sense” he met on his travels in America in the 1830s. Chevalier offers many biting and delightful images in this regard. Alexis de Tocqueville (1945 [1840]:vol. 2, 144–45) gives a more searching discussion of how Americans are “restless in the midst of abundance.” The restlessness Harriet Martineau (1962 [1837]:246–53) zeros in on was that arising from the Americans’ “servitude to opinion” or conformism. (Tocqueville, of course, had plenty to say here as well.) Martineau (p. 253) doubts whether anywhere in the Old World “there is so much heart-eating care, so much nervous anxiety, as among the dwellers in the towns of the northern States of America, from this cause alone.”

¹⁶ See Arthur 1988; Carlos & Fulton 1991, which argues that the “dominance of Toronto was the result of the chance location of the provincial capital there.”

¹⁷ Psychological experiments show that prospective setbacks will impel response more than prospective gains. See Kahneman et al. 1990.

¹⁸ In 1830, Massachusetts Chief Justice Parker said in his dissent in the *Charles River Bridge* case (which permitted a competing bridge): “The whole history and policy of this county from its first settlement furnish instances of changes and improvements, the effect of which has been to transfer the adscititious value of real estate in one town . . . to another.”

Table 2. The Earliest Turnpike Charters

	1792	1793	1794	1795	1796	1797	1798	1799	1800	Total
New Hampshire					1			2	1	4
Vermont					1	1		3	4	9
Massachusetts					1	2		3	3	9
Rhode Island			2						1	3
Connecticut				4		6	6	2	5	23
New York						1	2	5	5	13
Pennsylvania	1		1		2		1			5
Maryland					1		2			3
Virginia				2					1	3
Total	1	0	3	6	6	10	11	15	20	72

SOURCE: Davis 1917:vol 2, 216.

nanced by bonds.¹⁹ Americans never tried the trust method of turnpiking, but some commentators said in retrospect that the trust method would have proven more satisfactory than the company method.²⁰

In America, Virginia in 1785 and Maryland in 1787 authorized tolls on public roads initially constructed with tax money (Hollifield 1978:2). Connecticut in 1792 twice mixed the grant of toll collection with the grant of a lottery for public road building (Taylor 1934:6, 86, 122–23). In each case these efforts met with small success. In 1792 Pennsylvania chartered America's first turnpike company, the Philadelphia and Lancaster, 62 miles long and \$300,000 in capitalization (later raised to \$450,000). Two years later the completed road was admired for its magnificent construction (Plummer 1925:47). Although not all early turnpikes had such an auspicious beginning, the sluices were opening. As Harry Scheiber (1975:97) says, "[a]n initiative by one state would immediately raise the possibility of either competing or emulative responses by others."

The turnpike was to be the transportation innovation of a

¹⁹ Despite some fundamental variation, Americans patterned much of their turnpike law after the British model; see Szostak 1991.

²⁰ An insightful commentator said in 1819 that since the trust method preserves a public image and seeks to make specified payments on monies advanced, opposition will be diminished. "[T]he public[,] neither liable nor suspicious of imposition, . . . will cheerfully acquiesce in general regulations promotive of the improvement of the system, which would not perhaps be submitted to if emanating from an authority regarded with so much jealousy as the private incorporated company." "A Communication from the Comptroller, Transmitting a Report of Philip Church and Sylvanus Russell, Esqrs., Relative to a Road from Angelica to Hamilton: Together with a Petition of Sundry Persons" 14, 16 (bound with the New York State Library copy of New York Legislative Docs., 50th sess., 1827) ("Angelica-Hamilton Trust Proposal").

In one respect the company plan was more community oriented than the trust plan. Since the obligation to service a bond is much stronger than the obligation to make dividend payments on stock, bonds would have been much less suited to pitching turnpike financing as a public-spirited contribution to a community improvement. Hunter (1957:14) remarks on the irony of unprofitable companies in America and profitable trusts in Britain.

generation. Unlike the steamboat and the railroad, the timing and appeal of the turnpike cannot be explained by a technological breakthrough or, as in the case of the canal, by the opening of the state's purse. What made the turnpike a superior method of road care were its *organizational* advantages, and what made those advantages materialize was not some inspired vision but mere legislative *authorization*—authorization to lay out roadway and to demand tolls.²¹ Whereas appeal and timing are coincident for an unfettered technological innovation, for the turnpikes the appeal is explained by organizational innovations and the timing by legal innovation.²²

Compared to the public system of road care, the turnpike company is seen to have many organizational advantages. To obtain financing, turnpike organizers could reach beyond their town and concentrate on individuals most susceptible to their appeals. Turnpikes connected multiple towns, so management transcended the commissioner-overseer-laborer hierarchy in each town. Turnpike officers were free to hire contractors who bid competitively to do clearly defined jobs. The tollkeeper, who usually resided in a tollhouse, gave turnpike companies a man on the scene. In unofficial but important ways the tollkeeper would act as security guard, custodian, handyman, representative, and conduit to the turnpike directors of information and sentiment from the public.

But the most radical organizational innovation of the turnpike is that it charged users. Once 10 miles were constructed, the directors were authorized to call for the turnpike inspectors and, if satisfactory, a tollgate would be authorized, ensuring a flow of revenue. This lent a new willingness to undertake road construction and changed the obligations for road improvements. As Watson (*Commonplace Book*, 29) said in 1795: “no tax can operate so fair and so easy, as that of paying a turnpike toll, since every person is taxed in proportion to the benefit he derives from a good road, and all strangers and travellers are made equally tributary to its support—What can be more just?” Although not everybody was to agree with Watson, user fees meant that in road provision supply could be better matched to demand and that money would be available for maintenance or dividends. What Hurst (1956:23; cf. p. 26) says about the corporation in general can be well applied to the case of turnpikes: They served “to encourage the volunteer muster not only of capital but also of promotional and managerial talent.”

²¹ In viewing the early business corporations, Hessen (1989) nicely emphasizes the centrality of legislative *permission*.

²² Albert (1983) portrays the British turnpike trusts as an “administrative innovation.”

Early Turnpike Charters

Annual turnpike incorporation in New York is shown in Figure 2. About 5% of the charters were recastings of companies that had been previously chartered, and *between 60% and 65% of turnpike projects*²³ *never constructed enough roadway to justify a tollgate.* Although the incorporation count from 1797 through 1846 comes to 449, the number of those turnpike companies that actually built roadway and collected tolls was more like 165.

The charters of the 10 companies chartered in 1799 and 1800 provide a picture of the legal structure of the earliest New York turnpikes. These 10 charters are quite uniform.²⁴ Each opens with a listing of the petitioners and a general statement of the purpose and powers of the company. Subscription procedures are specified, including the price per share (usually \$20 to \$50), the down payment on shares, and the total number of shares. Once some specified portion of the whole had been subscribed, the stockholders were to elect directors, who in turn were to elect a president.²⁵ The directors would decide when calls would be made, and the stock was freely transferable.

Compensation to landowners was made for two distinct acts: taking acreage and entering lands. For turnpikes that were to follow preexisting roadbeds, the takings procedures were at one with the entry procedures. In the other cases the corporate officers were to lay out the road and settle with landowners along the route. When negotiations were deadlocked, or when the owner was "feme covert, under age, or non compos mentis, or out of the country," the company officials would apply to a common-pleas judge who would in some cases have the county sheriff assemble a jury of 12 "indifferent" men and in other cases himself appoint 3 freeholders not being residents of the towns through which the road was to pass.

Procedures for entering adjacent lands were specified because nearby stone, gravel, sand, and earth were used in constructing the turnpike. In entering lands workmen were to give advance notice, to do "as little damage . . . as possible," to re-

²³ We define "projects" by the route and the ensemble of organizers, not by charters. For example, the "Albany and Columbia" was chartered in 1798 and the same operation was rechartered the next year as the "Rensselaer and Columbia." We count this as two charters but one project. Usually we count as one project any series of charters for the same operation enacted within seven years of the first.

²⁴ Three prior charters of 1797 and 1798 were nonstarters. The 10 companies being examined were chartered by the following acts: 22d sess., 2d mtg.: chs. 30, 59, 73, & 79 (1799); 23d sess.: chs. 78, 79, 102, 105, & 121 (1800). These 10 proved to be of robust birth; segments of 9 were operating in 1850 and segments of 3 were operating in 1900.

²⁵ Stockholder voting was progressive. The most common formula was one vote for 1 share up to 10 and no additional voting rights beyond 10.

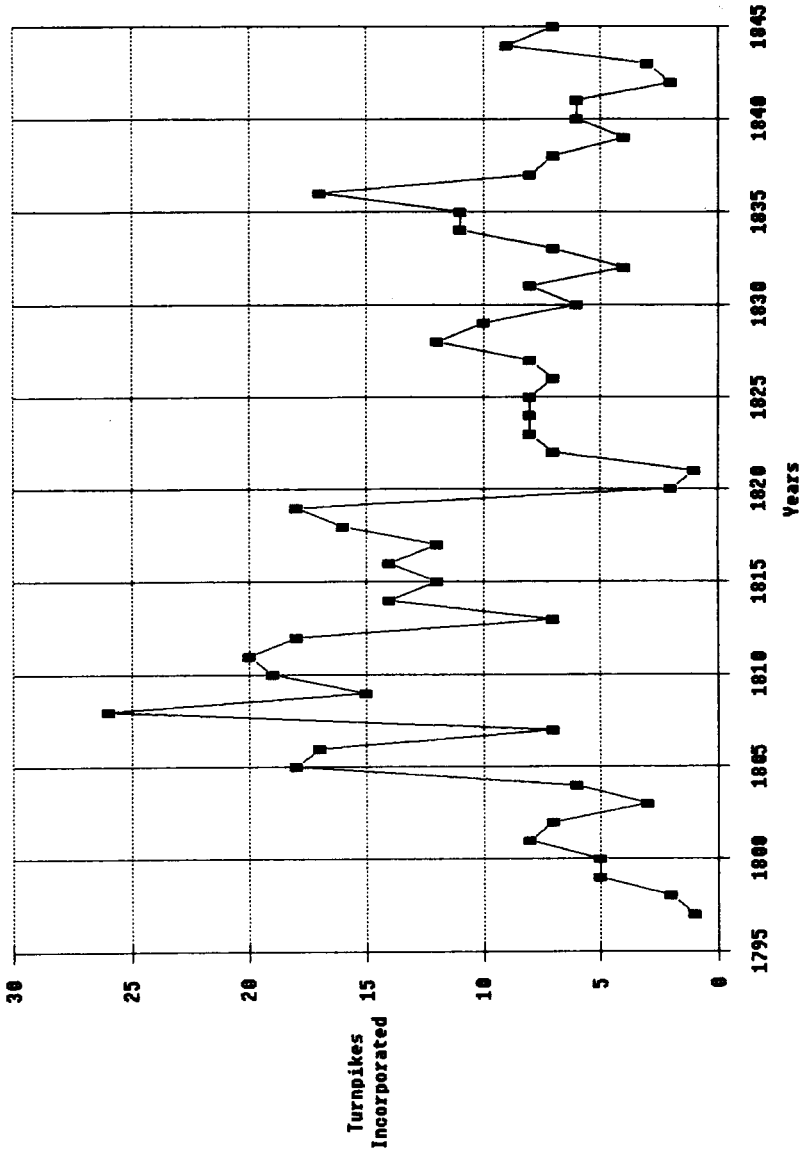


Figure 2. Turnpikes incorporated in New York State 1797-1845. Source: Evans 1948:17.

pair “any breaches they make in the enclosures thereof,” and to make amends “for any damage that may be sustained.” Disagreements were to be arbitrated by three “indifferent” freeholders chosen by the parties or by a justice of the peace should the parties disagree in choosing the arbitrators.

Construction specifications were brief. The specified width of the clearing was usually four rods (66 feet), with 24 or 28 feet bedded with a hard substance, shaped in a convex manner to give a “solid foundation.” Guideposts and milestones were to be erected. Once 10 miles of the road had been completed, the governor, upon notice, would appoint three “skillful and judicious” persons to inspect the construction and make a recommendation. On approval the governor would grant a license to erect a tollgate and to take toll. Usually gates were to be at least 10 miles apart.

The toll rates (Table 3) remained nearly constant throughout the turnpike movement. Since the passenger vehicles—sometimes referred to as “pleasure carriages”—paid significantly higher rates, the toll schedule discriminates against wealthier travelers.²⁶ Everyone was obliged to pay unless explicitly exempted. The typical list of exemptions for these early charters was those traveling “to or from public worship, or to or from his common business on his farm or to or from any mill.”

Table 3. Standard Toll Rate Schedule for a 10-Mile Gate on the Turnpikes of New York

	Cents
Chariot, coach, or phaeton (sometimes referred to as “pleasure carriages drawn by two horses”)	25
Sulkey, chair, or chaise (sometimes referred to as “pleasure carriages drawn by one horse”)	12.5
Wagons and all other four wheeled carriages drawn by two draft animals (3 cents for each additional animal; sometimes carts drawn by 2 animals were rated separately and at a lower rate)	12.5
Cart (drawn by 1 draft animal)	6
Sleigh (drawn by 2 draft animals) (2 cents for each additional animal)	4–6
Horse led or ridden	4
Score of cattle (pro rata)	12–20
Score of sheep or hogs (pro rata)	6–8

Like the public system of road care, turnpike charters specified fines for misconduct. For damaging turnpike property the most common fine was \$10; for evading the toll (or “shunpiking”), the most common fine was threefold the toll due

²⁶ Since the “pleasure” categories included mail and passenger coaches, perhaps the differential rates represents some price discrimination. In 1834 the legislature began dropping the “pleasure” travel differential, specifying coaches rates at the lower wagon rates.

(although for two companies it was \$10); for unreasonable delay by the tollkeeper, the most common award to the traveler was \$2 (although in one case it was \$25).²⁷

The turnpike companies were authorized to declare half-yearly dividends and were required to file annual reports to the state comptroller, although there is no evidence that any sizable portion ever did.²⁸ Usually the final item on the charter provided for dissolution of the company. If toll revenues ever repaid “all monies . . . expended in purchasing, making, repairing and taking care of [the] road together with an interest of fourteen [sometimes 12 or 10] per centum per annum,” then the road was to become state property. No turnpike ever met its end this way. On the bleak side, the charter would be forfeited if construction did not commence within two years of the charter date or if the road was not completed within seven years of the charter date. Many turnpikes failed to meet these deadlines but were readily granted extensions.

The most notable general feature of the turnpike charters is that, although heavily regulated, from a strictly legal viewpoint these creatures look like “business corporations”—that is, enterprises set up to earn and pay dividends. The basic legal form—a stock-financed franchise corporation with eminent domain powers, governed by construction standards and fixed toll rates—would remain for over a century.

But the following features of the early charters quickly became sore points with turnpike remonstrators and would be altered in subsequent legislation:

1. Company officers rather than public authorities laid out the road.²⁹
2. Construction standards were vague and, more important, except in two cases, no upkeep enforcement was specified (23d sess., chs. 78 & 105 (1800)).
3. Exemptions were vague and did not cover all the cases thought to be appropriate.
4. Gate location was largely at the discretion of the company.
5. There was no provision requiring that those petitioning the legislature for a charter give public notice of their intentions.³⁰

²⁷ 23d sess., ch. 79 (1800). Sometimes the various fines also carried cost of suit.

²⁸ The general turnpike law of 1807 instructed owners to file financial reports, but “only a very small proportion” did so, according to a circular of the state comptroller (ca. 1834; Third Great Western Turnpike papers in the New York Public Library). Any reports filed have since perished.

²⁹ In 1802 the Assembly saw to it that all future turnpike charters specified that state-appointed commissioners lay out turnpikes, and amendments were passed for existing charters (Lincoln 1909:vol. 2, 511).

³⁰ The general turnpike law of 1807 (p. 57) required that public notice be printed

Even after all these features were changed in favor of "the public," many folks still found plenty to complain about.

II. Dispute and Resolution

Turnpike Protest

It was by virtue of organizational novelty that the turnpike plan promised better roads, but the organizational features were starkly new and somewhat frightening. The introduction of a turnpike road through town immediately affected many inhabitants. The most visible impact was the strange new obligation of paying a toll. Modern researchers find a "status quo bias" for proposed changes; to the individual the losses involved in the change loom larger than the gains (Kahneman et al. 1990). As Oliver Wendell Holmes said in 1897: "It is in the nature of a man's mind. A thing which you enjoyed and used as your own for a long time, whether property or opinion, takes root in your being and cannot be torn away without your resenting the act and trying to defend yourself, however you came by it" (quoted in *ibid.*, p. 204). Turnpike protest thus found an easy foothold.

Turnpike protest can be split into general and local. The first kind is general opposition to the very idea of turnpiking or to the common guidelines that regulate turnpikes. The second is specific objections to local proposals. For example, inhabitants remonstrated against a turnpike bill because it did not make adequate concessions to the frequent and customary users of the road. Local and general protest naturally drew from each other.³¹

General opposition or, at least, reluctance to turnpiking is evident in frequent rejections of turnpike petitions before 1807. The legislative journals document this reluctance with elliptical remarks stating that "it would be improper and impolitic" to incorporate such a turnpike at present, or that few people along the proposed route have signed the petition (*Assembly Journal* 1806:236; *Sen. Journal* 1803:54, 75). Wrangling over turnpike bills was common, especially in the Assembly. Bills are often engrossed for revision, votes are often called, and sometimes second votes were taken. (The general turnpike law of 1807 would settle most of the common battles

for four weeks in a local newspaper before application be made. The Assembly (*Assembly Journal* 1807:294) passed a resolution requiring that six weeks' notice be made for any petitioning pertaining to a turnpike company, but it never became law.

³¹ The New York experience of turnpike opposition seems to have paralleled the experiences of other states. See Plummer 1925:49-51; Durrenberger 1931:81-82; Davis 1917:vol. 2, 216, 219, 220; Taylor 1934:113, 118, 121-22, 200, 283-87; Parks 1966:182-85.

and make turnpike chartering more of a rubber-stamp procedure.)

We get some insight into the party lines on turnpikes from a piece of correspondence from 1802 between two Federalists. The writer, John Radcliffe, is evidently an organizer of the Dutchess Turnpike and the recipient is Ebenezer Foote, a state senator. The charter of the Dutchess Turnpike was receiving final approval at the time of the letter. The letter opens: "I feel highly gratified in the success of our turnpike—It was more than could be expected considering the opposition and general dislike to such bills in the lower house."³² Radcliffe then reports on recent party meetings. The Federalists, Radcliffe says, are likely to nominate Foote for another term in the state Senate. The letter also reports on the Republicans' meeting, where Abraham Adriance was nominated for the same seat. Radcliffe expresses his hope that the Republicans would split over Adriance: "Adriance will be much opposed . . . —They are much disgusted with his conduct about turnpikes and carry their resentment so far that I am in hopes it will defeat his election." Presumably Adriance was a violent opponent of turnpikes.³³

There is a smattering of evidence from New York and other states that Federalist were, relative to Republicans, friendly to turnpikes.³⁴ It is difficult to know, however, to what extent there was political alignment on turnpike issues. An investigation of legislative voting in New York would be arduous because votes were called irregularly and, for the period in question, there is no ready record of party affiliations. We doubt that there was a rigid political alignment on turnpike issues, and if there was, it is quite doubtful that it persisted more than 10 years. There is almost no sign of party alignment on the issue in the plethora of contemporary materials pertaining to turnpikes. Many Republicans strongly favored government encouragement of internal improvements (Nelson 1987:125). John Brooke (1989:287–88), who studied Worcester County, Massachusetts, noted that turnpikes received support from both prominent Federalists and Republicans. Turnpikes were, at bottom, a local affair, or even a multitude of local affairs.

³² John Radcliffe to Ebenezer Foote, 3 April 1802 (item 11633, New York State Library). The next sentence is intriguing: "I feel myself under many obligations to you for your assistance and friendship in this business and shall be happy in the opportunity of making a return."

³³ Radcliffe concludes the letter by promising his support in Foote's campaign. As it happens, Adriance won Foote's seat. Foote served in the State Assembly 1792, 1794, 1796, and 1796/97 and in the State Senate 1799–1802. Adriance served in the State Assembly 1798/99–1802 and in the State Senate 1803–6.

³⁴ Fee 1933:144–47; Jones 1990:24–25. In Connecticut, in 1801, a political farce was performed: "Federalism Triumphant in the Steady Habits of Connecticut Alone, Or The Turnpike Road to a Fortune" (by Leonard Chester; available from Huntington Library, San Marino, CA). The play is full of contemporary private jokes and snipes at turnpikes.

The best examples of general opposition to turnpiking can be found pasted into Elkanah Watson's *Commonplace Book*. During the winter of 1801–2, Watson carried on a lengthy debate with an opponent who wrote as "Civis." In a margin of his scrapbook Watson comments:

this Civis was a member of the Legislature[,] a Doct[or] M[oses] Younglove from Columbia County—a man seeking popularity—he found means to prejudice 2/3's of an ignorant Legislature who were opposing Turnpike incorporations . . . —at length t'wards the Close of the Session . . . they gave way to Reason & conviction & several turnpikes were incorporated.

Younglove ("Civis") was an assemblyman during 1802; his party is unknown but presumably Republican. Although Watson shrewdly used the pen name "A Republican," he had significant Federalist sympathies, although he berated "the party spirit."³⁵ The debate between Watson and Civis is a fascinating sample of the period's struggle for and against social and economic change. For the most part, the present authors view Watson as an informed and pragmatic voice for progress and good sense.

Civis's four articles are classic examples of early American egalitarian protest against corporations.³⁶ We hear that turnpiking is "hostile to sound republican maxims," that it "evinces a transition . . . from freedom toward despotism," that turnpikes "encourage unfair speculation," that "the opulent will generally become the stockholders": "to them the more numerous and less wealthy must pay toll, and they must have double interest; thus [turnpikes] tend to make the rich richer and the poor poorer; to divide the community into two orders of opposite interests, payers and receivers." Another general opponent of turnpikes, writing as "A Friend to the Poor," argues forcefully that turnpikes pit the haves against the have-nots: "the poor, the farmers, and the mechanics will be grievously oppressed."

Civis raises the specter of corporate privilege against turnpikes, saying, "it is not turnpike corporations only that excite my apprehension. . . . [W]e are continually incorporating companies of various description, of a combined interest, distinct from the general interest of the people, and in some cases probably opposed to it." Civis continues: "In this we follow the monarchical monopolizing plan of Britain. . . . Our fathers, and

³⁵ Watson's attacks on "the party spirit" are themselves characteristic of Federalist thinking. According to his memoirs, Watson was a close friend of John Adams and a strong supporter of protective tariffs, the hallmark of the Federalist economic program. See Watson 1857:398.

³⁶ For a concise dissection of anticorporation rhetoric see Hurst 1956:30–49. For a view of anticorporation sentiment more respectful than Hurst's or ours, see Harvard Law Review 1989; Prude 1983:119–20.

we, have heretofore done without them—and I had rather enjoy LIBERTY and EQUAL RIGHTS in the old plain way, under some inconveniences, than sacrifice them at the shrine of Monarchical improvements.”

In answering Civis, Watson distinguishes different types of corporations. He concedes that “certain corporations have become powerful instruments in the hands of statesmen,” but, he says, to argue that “therefore all corporations have a dangerous tendency, is a sort of reasoning truly puerile.” (Watson says that such indiscriminate condemnation of corporations is “not very uncommon.”) He mentions incorporation of “religious societies, the founders of libraries, [and] the ladies of New-York, who have associated for charitable purposes.” He then derisively quotes Civis on incorporation leading to despotism. Watson’s argument is really a bit tricky, because, unlike the corporations he mentions, turnpikes were set up to pay dividends.

Watson says that most people invest in turnpikes for the indirect benefits, and he notes that, if dividends are the main concern, monied men have much better ways of investing their wealth. He ridicules “speculation” as a “scare-crow” and says that by this accusation “there are few employments that cannot be proved to be criminal.” He mirthfully describes the speculative nature of several occupations, running down to the minister and the chimney sweep. If turnpikes were a speculative plan, Watson notes, “there are few men in the country too poor to partake of the spoil.” The down payment on turnpike stock was typically \$5.

Rarely do the general opponents of turnpiking make specific criticisms. Civis complained that the labor needed to construct turnpikes may “render labourers scarce and dear—to the . . . injury of the agricultural interest.” Civis also suggests that the exemptions from toll have not always been adequate and that turnpikes “forcibly” take private property for private corporations. In response Watson says that no turnpike charter is “without special provisions interwoven in them to guard against every abuse of privilege,” and he extols turnpikes for shortening and improving roads. The improvements reduce travel time, permit larger loads, permit greater safety and comfort, and reduce wear and tear. Furthermore, a turnpike company relieves the inhabitant of road taxes. Rather than the poor inhabitant being called to work on the roads, “every distant traveller is made tributary to support the road.”³⁷

³⁷ Commonplace Book, 36, 42 (1), 45 (1), 39 (1), 37 (1), 44 (3), 44 (4), 41 (3), 42 (2), 44 (2), 37 (1). Watson and his opponents were not entirely opposed. Civis supports turnpikes that would “gather so much toll yearly as to be soon exonerated from the debt, and then be free, or else become a source of revenue to the state.” (Incidentally, turnpikes were not debt financed.) Watson, by a similar token, says, “[a]lthough a warm and decided advocate for Turnpikes, I am no advocate for the abuse of the privilege.”

Watson would have us believe that “[s]trong prejudices have been excited against Turnpikes . . . by a few leather-heads.” Turnpikes were vulnerable to “frightful phantoms” of the day, notably those based on wealth and occupational distinctions (*Commonplace Book*, 48 (4)). Indeed, underlying much of the turnpike hostility was the idea that if turnpike stockholders were getting richer, then someone else must have been getting poorer. Consider the following remark of Horatio Spafford, the author of two New York State gazetteers: “[T]his description of incorporations [turnpikes] has done less harm than any other, because the property invested has been less productive.” (Spafford 1981 [1824]:605, 263 shows similar thinking in a diatribe on usury.) On specific questions about specific turnpikes (Who shall be toll exempt? Where shall the gates be placed? How will upkeep be assured?) inhabitants voiced meaningful and justifiable concern. But these issues were shrouded in a popular hostility arising in no small part from resentment and distrust.

Turnpike opposition may also be ascribed to philosophical disposition. Lance Banning (1978) argues that many Jeffersonian Republicans used the language of civic republicanism to express their fears that growing commercialization would corrupt American virtue and independence. However, the impetus of the turnpike movement—small communities competing for commercial advancement³⁸—casts doubt on the proposition that the majority of people, whether Republican or Federalist, harbored anticommercial feelings.³⁹

Many distrusted corporations because they were granted special powers and smacked of privilege. Hendrik Hartog (1983:126–27) points out, for example, that Republicans identified the Montgomerie Charter, the document that gave New York City corporate status, with “aristocracy” because the Federalists used its provisions to bar many Republicans from voting in city elections. To get around the Montgomerie Charter, Republicans argued that the state legislature was the only legitimate repository of government power. This line of thinking tended toward strict legislative control of the turnpikes by charter provisions.

Signs of local turnpike protest are rife in the legislative

and he often discusses the need for proper checks. *Ibid.*, 44 (4), 48 (4), 41 (1), 44 (2), 49 (1).

³⁸ Hurst (1956:10) emphasizes the idea that the impetus for commercial development came from the local community, not the central state: “Corporation law has always been an instrument of wants and energies derived from sources outside the law; it has not been the prime mover.”

³⁹ Rothenberg (1981) describes the commercial orientation of early American farmers; in a similar vein see Lemon 1980. For the pro-market aspects of the Republicans, see Appleby 1984. See also the exchange in 43 *William & Mary Quarterly* (1986) between Banning and Appleby.

journals during the first decade of turnpike chartering. The journals state only the gist of committee reports dealing with petitions and remonstrations. For example, remonstrators against the Westchester Turnpike beseeched the legislature “not to establish by law the road so altered, and to declare the . . . draw bridge a nuisance” (*Sen. Journal* 1803:74). Unfortunately the journals do not elaborate reasons. The petitions themselves have perished (as explained in Appendix 1), so discerning the real contentions is mainly guesswork.

Evidence of local protest can be seen in other contemporary sources as well. Objectors to one turnpike advertised their efforts to “evade and stop . . . the unjust plan of erecting a Turnpike Road” (*Poughkeepsie Journal*, 7 Dec. 1802, p. 3). In litigation involving the New Windsor and Blooming Grove Turnpike, the turnpike’s counsel requested a change in venue on the grounds that “from the prejudices of the county against turnpike roads, an impartial trial could not be had” (*New-Windsor Turnpike v. Wilson Road* 1805:127). A few years later the same turnpike sought legislative redress to problems arising because local inhabitants “make so great opposition . . . that the object cannot be effected” (*Assembly Journal* 1808: 215). A different indication of hostility is an 1805 resolution of the Albany and Schenectady Turnpike Company: “if any Toll Gatherer shall be molested, injured or prosecuted by any person or persons for truly & faithfully executing the Duties enjoined on him,” the company will assume any damages.⁴⁰

We suspect that some people felt a need to express publicly disapproval for turnpikes while harboring a secret appreciation for the idea.⁴¹ The seemingly public role is almost invariably that of siding with the assumed downtrodden, even when the egalitarian charges appear dubious, as they largely did in the case of turnpikes. Perhaps we detect a hint of this public role playing in the following Assembly report (*Assembly Journal* 1806:225) on a petition to organize a turnpike: “the committee believe that turnpikes do not advance the public good, yet they are of opinion, that the present application is as free from imperfections as any which have been presented to this house” and support the petition.

The following sections on upkeep, concessions to local users, and toll evasion provide further evidence of general opposition and local protest to turnpikes.

⁴⁰ Albany and Schenectady Turnpike Company, Minutes Book, 7 Sept. 1805 (manuscript, New York Historical Society).

⁴¹ Timur Kuran (1990) explores the ideas of one’s outward preferences being at variance with one’s private (or true) preferences.

Peremptory Upkeep Law

Since turnpike companies were often granted existing (though crude) roadbeds, and since they typically enjoyed a monopoly position, upkeep guidelines were in order. In the charters of 1799 and 1800 there were quality standards for the initial condition of a new turnpike, but *upkeep* standards and procedures were either nonexistent or extremely elliptical.⁴² The 1801 charters contain elliptical remarks to the effect that the company is to “maintain and keep the [road] in good order,” but procedures are not specified.⁴³

The vagueness surrounding upkeep was a leading sore point for turnpike opponents. In 1803 Governor George Clinton said that although new turnpike charters specify that turnpike commissioners handle disputes about turnpike operation, “no remedies were extended to the imperfections” of the earlier charters. In these earlier charters “no mode is prescribed to exact a compliance from the companies with the intentions of government.” He suggested establishing public positions to deal with the matter (Lincoln 1909:vol. 2, 527). Similar concerns are evident when Elkanah Watson (Commonplace Book, 49 (1)) describes the need to guarantee that the public would not be charged if the road were out of repair. “Should this evil be remedied, every opposition would be silenced.”

It is likely that the outcry over inadequate upkeep specifications arose not because companies were actually demanding tolls on bad roads but because there were no guarantees against such practices. There simply were very few turnpikes operating in 1803. It usually took one to three years to open a turnpike. Furthermore, there were standards for the initial condition of the road, so it is unlikely that in these early days many turnpike companies had the opportunity to demand toll for a shoddy product (not that they wouldn’t, given the opportunity).

Following the governor’s suggestion, an upkeep law governing all turnpikes was passed in 1804 (27th sess., ch. 81). The state appointed county turnpike commissioners to hear complaints. If the commissioners found the road out of repair, they would notify the company, which was to open the gate until

⁴² See charters for Mohawk Turnpike & Bridge Co., 23d sess., ch. 105, 561 (1800); Columbia Turnpike Road Co., 22d sess., ch. 59, 379 (1799); Seneca Road Co., 23d sess., ch. 78, 528 (1800).

⁴³ Charter for Union Turnpike Rd. Co., 24th sess., ch. 118, 272 (1801). In 1802 we see greater attention to upkeep, as charters designate that three commissioners, appointed by the state, would hear complaints, examine the road, and order the gates open if they found the condition wanting. Toll-taking privileges would be returned when satisfactory repair had been made; see in 25th sess. (1802) charters for Troy and Schenectady Turnpike, ch. 95, 106; Hudson Branch Turnpike, ch. 96, 112; Dutchess Turnpike, ch. 111, 130.

repair was made. If the company failed to open the gate, the commissioners appealed to the district attorney to prosecute the company. Penalties for noncompliance are not specified.

This law did not allay hostility to turnpikes. In 1806 an Assembly committee introduced a revision of the law, arguing that “incorporations of this kind generally tend to aristocracy; and if their privileges are not well defined, probably may lead to anarchy. . . . [T]he restrictions in the [1804] act . . . are not sufficiently coercive to meet the encroachments made by those corporations, on the rights of persons travelling their roads” (*Assembly Journal* 1806:225). After considerable wrangling, a more peremptory law emerged in 1806 (*ibid.*, pp. 285–87; turnpike upkeep law, 29th sess., ch. 160, 600–601 (1806). It gave commissioners power to order the gates open and specified a \$5 fine for every instance of toll taking after the commissioners’ order was received. Thus the new law cut out the buffer of the district attorney and specified a heavy fine.

The Council of Revision⁴⁴ vetoed the 1806 law, saying:

The order of the commissioners is to be peremptory in the first instance, and requires instantaneous obedience. The bill therefore vests in these commissioners an arbitrary power over the interest and property of individuals, which is unknown to the constitution, and if carried into effect, would become in a high degree injurious and alarming. . . . [T]he rights vested in the stockholders of a turnpike company, incorporated by law, are as sacred and as much entitled to protection, as any other private rights, and the stockholders cannot be constitutionally deprived of them, by the mere allegation of a forfeiture without a trial.

The veto was overridden.⁴⁵ The language of the veto indicates the tension between viewing turnpikes as public highways, as judges often insisted, and viewing them as a species of private property—a tension that endured until the last turnpike was shut down.

A memorial of the First Great Western Turnpike Company beseeched the legislature to amend the new law. The memorial says the law shows bad faith in that turnpikes are enormous and highly uncertain undertakings that provide roads for the state. The law is “pregnant with effects ruinous to their interests.” There is no guarantee that fair-minded commissioners shall be entrusted with the new peremptory powers.⁴⁶ “[I]f in one instance a Law can be made, which in any way changes the origi-

⁴⁴ New York’s 1777 constitution joined the chancellor, the supreme court judges, and the governor as the Council of Revision to review legislation.

⁴⁵ *Assembly Journal* 1806:356, 360. The Assembly’s override vote was 54 to 15.

⁴⁶ The Prattsville Turnpike beseeched the governor to replace the local turnpike inspector because of “his avowed hostility to the . . . Prattsville Turnpike Road which is located in his neighborhood.” Undated letter (probably late 1840s) from Alvin Bushnell, Durham Center Museum, East Durham, NY.

nal tenure of a property, vested by Charter, there can remain no confidence that future encroachments will not be made on it and continued to its final annihilation." The memorial claims that the company would not have been undertaken if the new terms had been known in advance and invites the state to take over the company by a full reimbursement of the stock (Legislative doc. 1807, not numbered). The memorial had no apparent impact. The 1806 upkeep law was incorporated into the 1807 general turnpike law (p. 58), with the continued toll-taking fine upped to \$10.

Concessions to Local Users

Just as the natural-monopoly aspect of turnpikes called for upkeep regulation, so too did it call for concessions to local and frequent users. All recognized the injustice in routinely demanding toll from someone living a half-mile from a newly erected gate. The problem was how to adjust duties from the various users. How would distinctions be drawn and how would they be enforced? One goal was to prevent unjust toll taking, another was to prevent unjust free passage. The practical trade-off between these goals was considerable. Keep in mind that those living along a turnpike were its greatest beneficiaries. As with upkeep regulation, the laws were far more sensitive to the goal of no unjust toll taking than to the goal of no unjust free passage.

One means of permitting free travel was spacing tollgates at great distances. Normally tollgates had to be at least 10 miles apart, permitting some traffic to use the road without encountering a gate. Also, gates were not permitted near town centers. In later years, when the financial distress of the companies was manifest, companies were often permitted "half-houses," 5 miles apart, demanding half the specified rates.

The most basic form of concession was the toll exemption. As noted above, the earliest charters typically exempted travel to or from public worship, a mill, or on "his common business on his farm." Even the most unambiguous exemptions face the problem of proof,⁴⁷ but the "common business" exemption is particularly fuzzy. No doubt strife was common.⁴⁸

The general turnpike law of 1807 created standard exemptions for anyone traveling for the following purposes:

⁴⁷ The historian of a New Hampshire turnpike notes that "ungodly sinners evaded the payment of toll by claiming that they were passing . . . to or from 'public worship,' when they never intended to attend anything of the kind in any sense known to the religious world" (Shirley 1881:430).

⁴⁸ Litigation over exemption disputes include *Jones v. Estis* 1807; *Conklin v. Elting* 1807; *Hearsey v. Pruyn* 1810; *Hearsey v. Boyd* 1810; *Chestney v. Coon* 1811; *Stratton v. Hubbel* 1812; *Stratton v. Herrick* 1812; *Bates v. Sutherland* 1818; *Newburgh & Cochection Turnpike Co. v. Belknap* 1819; *Norval v. Cornell* 1819.

- public worship
- a funeral
- a grist-mill for the grinding of grain for family use
- a blacksmith's shop to which he usually resorts
- a poll or town meeting to vote
- a physician or midwife
- jury duty or to give witness in court
- military service
- and no toll shall be taken at a gate from anyone residing within one mile of the gate.

Also, toll was adjusted to wear and tear on the road in that wagons with wheels 6 inches wide paid half toll, with wheels 9 inches wide paid quarter tolls, and with wheels 12 inches wide paid no toll (p. 56). After 1807 the general law became standard reference for turnpike charters.

It is likely that some of the protest was a means to obtaining specific concessions. In his study of the New England turnpikes, Parks (1966:81) says: "What New Englanders most resented about turnpikes undoubtedly was the impingement upon their pocket book in the form of tolls. Opposition often was abandoned once favorable concessions had been secured." Durrenberger (1931:81) and Davis (1917:vol. 2, 219) make similar remarks. We see a hint of negotiation in the effort of the Mohawk Turnpike to undo the toll exemption on sleighs. A Senate committee reports: "At the time this company was incorporated [1800], there were so few in existence that the want of experience and the novelty of the measure, produced much opposition among the people, and some of the restrictions peculiar to this company [namely, the sleigh exemption]" (*Sen. Journal* 1814:62). Concessions granted to remonstrators against the Watervliet Turnpike provides another illustration. An Assembly committee explains that in 1827 a petition to form the turnpike "was resisted by the farmers of Watervliet. . . . During the succeeding season it appears that a compromise was effected, by which some of the farmers of Watervliet were induced to withdraw their opposition, under a stipulation that they should forever be exempt from the payment of toll" (Assembly doc. no. 154 (1828)).⁴⁹

The legislature's handling of concessions had two notable features: first, it sought to resolve matters of a local and *sui generis* nature by laying down guidelines from the state capitol; second, it chose guidelines that were more sensitive to the traveler's plight than to the turnpike company's.⁵⁰

⁴⁹ Assembly doc. no. 154 (1828). The next year, however, the exemption was repealed, and afterwards the farmers of Watervliet fought in vain to restore it. See amendments to charter of Watervliet Turnpike, 51st sess., ch. 141 (1828), and 52d sess., ch. 258 (1829); Assembly doc. no. 92 (1831).

⁵⁰ It seems to us that the concession issue might have been better handled by delegating it to local authorities in touch with local conditions. In rare instances we see

Toll Evasion

Perhaps the most serious problem for turnpikes, again of a particularistic nature, was toll evasion. The main form of toll evasion was "shunpiking." It was quite easy for horses and high-mounted vehicles to take a small excursion through farmland or wilderness to avoid the tollgate. In a short time a trail would emerge. A common penalty for shunpiking was \$5 dollars plus cost of suit. Toll evasion also took the form of falsely claiming toll exemptions. Tollkeepers found it costly to hinder travelers and were forced to adopt a lenient attitude. Finally, towns often laid out common roads that served as shunpikes (*In re Flatbush Avenue* 1847).

In part, toll evasion was another expression of animosity toward turnpikes. The 1807 memorial of the First Great Western Turnpike says: "As is usual with novel institutions, the [turnpike] companies had and still have to contend with the prejudices of many people whose conduct towards them is governed by a spirit of settled hostility, evinced in numerous and too frequently successful efforts to evade payments lawfully due."⁵¹ By evading toll, malcontents could administer their own justice as well as save a nickel.

The undying nature of shunpiking is evident in a committee report on the Dutchess Turnpike: "[S]oon after the erection of that Gate, the first shunpike was made going round. . . . [A] law was passed authorizing the removal a short distance East. After this alteration two new shunpikes were made."⁵² The committee recommended the erection of a half-house. An 1810 amendment (33d sess., ch. 120) to the Dutchess charter increased the fine for shunpiking and specified that the burden of

resort to this approach. With concessions decided locally and individually, it would be possible to reduce the trade-off between no unjust toll taking and no unjust free passage. One problem with the delegation approach could have been the potential for extreme views of justice. Turnpike companies might have preferred the blunt blows of the legislature to the possibility of mortal stabs by local decisionmakers.

A good way to deal with local users would have been what economists call a *two-part tariff*. Rather than simply exempt local users, the legislation could have employed the following pattern: "Any inhabitant living within X miles of the tollgate may elect to pay a semiannual fee of Y dollars that entitles him to a $Z\%$ discount off the normal toll at the gate in question." For example, residents living within two miles of the gate would be permitted to pay a flat fee of \$5 every six months and enjoy a 75% discount at the gate.

Such a two-part tariff (instead of exemptions) would have extracted payments from the local users—usually the chief beneficiaries of the road—without seriously interfering with low-valued marginal trips (because the marginal cost to the traveler is heavily discounted). If $Z=0$, no trips at all would be discouraged. The legislation could have stated separate options for those residing at various distances from the gate.

⁵¹ Legislative doc. no. 2 (1807). Jones (1990:27) also notes the connection between toll evasion and hostility.

⁵² New York Committee on Roads, Bridges, and Incorporation of Turnpikes, undated manuscript, reporting on application of the Dutchess Turnpike (in papers of the Dutchess Turnpike, New York State Library).

proof lay with the traveler. Regarding a petition by the Farmers Turnpike, a report reads: "Your committee are . . . of opinion, that abuses have been practiced by persons travelling said road, in claiming exemptions . . . when they were legally liable to pay, [and] . . . by persons leaving said road . . . [and] entering upon said road, after having passed the gate" (Legislative doc. no. 140 (1825)). Although the committee introduced a bill for relief, none was passed.

Reports concerning the Schoharie Turnpike indicates how serious the shunpiking problem could be. In 1843 the company sought permission to relocate one of its gates because "from one-half to two-thirds of travel for some years have passed around the gate." The committee favored the company, noting that it "had always shown itself lenient and liberal towards these inhabitants in their exactions of toll" and "that the company have never made a dividend since the construction of its road" (Sen. doc. no. 65 (1843)). Two years later the company was still seeking redress, and a committee report in support of the company noted that "since the erection of the gate in question, . . . there [have] been many layings and discontinuances of roads and pieces of roads in the vicinity of said gate, by which means the greatest or larger share of travel goes . . . around the gate" (Assembly doc. no. 103 (1845)). The final document on the matter is the report of the company's treasurer, responding to the Assembly's inquiry of how much in penalties the company had collected from shunpikers during the previous 10 years. The treasurer said that the amount collected during that time had been between \$25 and \$50. The treasurer had "no hesitation in saying" that this amount "would not half pay the cost, expense, and trouble" expended in prosecuting shunpikers during that time. The treasurer concluded:

The penalty for passing round a gate . . . is five dollars . . . [S]ay that only ten [offenses] occur daily, as on an average for ten years, (and the undersigned verily believes that there has been more,) the penalties would amount to one hundred and eighty-two thousand five hundred dollars, for ten years. (Assembly doc. no. 113 (1848))

Despite the many documents and the sympathy of the investigating committees, the legislative record shows no relief for the company.

Shunpiking seems to have plagued turnpikes throughout the Northeast.⁵³ Fisher Ames, who was president of a Massachusetts turnpike company, estimated that his company's earnings would be almost 60% greater if not for shunpiking (Parks 1966:78). In New York the pervasiveness of shunpiking was re-

⁵³ Parks 1966:154 says of New England: "Schemes for avoidance of toll payment were widespread and furnished one of the most difficult problems in turnpike operation." See also Durrenberger 1931:78-79; Taylor 1934:200-204.

flected in the frequent requests to relocate or multiply tollgates or to increase the fine for shunpiking.⁵⁴ It was also reflected in the litigation involving charges against shunpikers and property owners who permit (and even encourage) shunpiking through their property.⁵⁵ In one case where a traveler was fined for shunpiking, Chief Justice Spencer said it did not matter “that other persons have been in the habit of doing so” (*Carrier v. Schoharie Turnpike Road* 1820:55).

The general turnpike law of 1807 seems to leave the initial location of gates to the state-appointed turnpike commissioners (p. 54), but *relocation* seems to have been the province of the legislature.⁵⁶ Although the legislature often permitted companies to combat shunpiking by relocating gates, often they did not. A legal case involving the Columbia Turnpike resolved that once a company had erected a gate pursuant official instruction, it could not relocate the gate “without some strong and manifest necessity to warrant it” (*Griffen v. House* 1820:397). To obtain permission to relocate a gate, a company would have to petition the legislature. The courts would be left to decide such details, for example, as whether a gate was to be erected “near the dwelling-house of John van Hoesen.”⁵⁷ As we saw in the case of the Schoharie Turnpike, even after wrestling with procedures, relief was not assured even in desperate circumstances. Turnpike companies needed flexibility and timeliness in combatting shunpikes, which could proliferate like mushrooms.

Finally, it is possible that the refusal to adopt effective statutory remedies for shunpiking—reflected in the long distances between gates, the sluggishness and uncertainty of multiplying or relocating gates, and the inadequacy of penalties against shunpikers—was yet another way in which the legislature made concessions to local users. It is interesting to note that the typical toll-evasion penalty on turnpikes was \$5, while the typical toll-evasion penalty on toll bridges, which faced much less evasion, was \$10 (cf. 25th sess., ch. 42, 75 (1802); 26th sess., ch. 12, 261 (1803); 27th sess., ch. 92, 518 (1804).

⁵⁴ Some examples of gate relocation include 32d sess., ch. 81 (1809); 34th sess., ch. 9 (1811); 41st sess., ch. 29 (1818); 42d sess., ch. 199 (1819); 53d sess., ch. 121 (1830); 55th sess., ch. 176 (1832). Examples of increasing the shunpiking fine include 33d sess., ch. 120 (1810); 35th sess., ch. 29 & ch. 233 (1812); 36th sess., ch. 190 (1813). Many acts authorized the multiplication of gates.

⁵⁵ Court decisions ordering that shunpikes on private lands be closed include *Croton Turnpike Rd. v. Ryder* 1815; *Newburgh & Cohecton Turnpike Rd. v. Miller* 1821. A case brought against a shunpiker is *Carrier v. Schoharie Turnpike Rd.* 1820.

⁵⁶ In Massachusetts relocation of gates was handled locally; 1805 Mass. General Turnpike Law ch. 79, 651.

⁵⁷ In 1836 an amendment to the Revised Statutes authorized county judges to decide the location and relocation of turnpike gates; sess. 59, ch. 284, 399 (1836).

III. The Unfolding of the Movement

Unprofitability

As in other states, turnpike companies in New York were generally unprofitable. Much contemporary opinion supports this view. An impartial source said that in conflicts over turnpike management, "in a vast majority of cases, the turnpike companies are the great sufferers."⁵⁸ Turnpike foe Horatio Spafford (1981 [1824]:605) indicated general turnpike unprofitability. In a tract on roads Bloodgood (1838:97) said of the New York turnpikes: "Generally they have never remunerated their proprietors, nor paid much more than the expense of actual repairs." In 1840 Chief Justice Nelson made the sweeping statement that of all types of franchise corporations—which were an unprofitable lot—none had been "less gainful to the corporators" than turnpikes (*People v. Kingston & Middletown Turnpike Road Co.* 1840:345). Although there is no way to bolster this impression with systematic data, the tidbits from contemporary documents are consistent with the general contemporary perceptions of unprofitability. Reports of various companies, for example, stated, "the stock at present is considered of no value," "the toll will by no means keep [the road] in repair," "no dividend has ever been made on the stock," stockholder return has been "less than three-fourths of one per cent per annum," the stock "has been wholly unproductive," and "the road [is] indebted . . . and no dividends of course made."⁵⁹ Less dismal remarks are also found, but not many and not much less dismal. Nearly all turnpikes were returned to the public domain by abandonment or condemnation, without stockholder compensation.

The legislature's attitude seems to have been that an existing turnpike should be kept alive but not healthy. Very rarely were toll rates increased. To what extent companies even petitioned for increases we do not know, but it appears to have been little.⁶⁰ Turnpikes may have realized the futility of seeking rate increases. In the Minute Book of the Albany & Schenectady Turnpike, for example, an entry from 1819 speaks of the company petitioning the legislature for toll increases, but the rates were not increased during the ensuing decade.⁶¹ In addi-

⁵⁸ Angelica-Hamilton Trust Proposal, p. 14 (cited in note 20).

⁵⁹ Assembly doc. no. 219 (1834); 40th sess., ch. 11, 9 (1816); Assembly doc. no. 256 (1831); Assembly doc. no. 155 (1832); Assembly doc. no. 113 (1831); Hamilton & Skeneateles Turnpike Company (incorporated 1806) Records, stockholder list dated 26 July 1825, last page (manuscript, New York State Historical Association).

⁶⁰ Examples of acts increasing toll rates include 25th sess., ch. 84 (1802); 29th sess., ch. 41 (1806); 31st sess., ch. 70 (1808); 35th sess., ch. 29 (1812); 43d sess., ch. 133 (1820); 49th sess., ch. 29 (1826).

⁶¹ Albany and Schenectady Turnpike Company, Minutes Book, entry of 5 Jan.

tion, toll evasion may help explain the absence of rate increases. In increasing price any firm faces a trade-off between more revenue per unit sold and fewer units sold. But the turnpikes also faced a margin in toll evasion. Higher toll rates might have induced greater toll evasion. (In 1989 when the Garden State Parkway increased its tolls from 25 cents to 35 cents, the evasion rate increased by about 70% and remained there until policing was stepped up (Wyckoff 1990; New Jersey Highway Authority 1990)).

Financing in the Shadow of Unprofitability

Although dividends were meager, the community benefits arising from a turnpike were copious. Benjamin De Witt (1807:215) said that turnpikes “encourage settlements, open new channels for the transportation of produce and merchandise, increase the products of agriculture, and facilitate every species of internal commerce.” All these advantages would generate higher land values. Contemporary sources of all varieties show a foremost concern with the local benefits to be derived from turnpikes. Also, turnpikes were a prime implement of competition in the rivalries between towns and regions.

Turnpikes were enormous undertakings. They were commonly between 15 and 50 miles long and cost about \$1,500 per mile. Such projects were too large for a coterie of affluent citizens to bankroll. We have stockholder counts for only six New York companies; the lowest is the Owego & Ithaca Turnpike, with 28 subscribers, and the highest is the Third Great Western, with 183.⁶² Since turnpike stock was recognized as unremunerative (particularly after about 1810), turnpike supporters faced a grave free-rider problem. The prospective beneficiaries of a turnpike numbered in the hundreds, and buying stock was much like making a charitable contribution to a community improvement (or public good). Once stock subscriptions were sufficient to construct the road, there would be no way to withhold the benefits from those who did not contribute. Free riding, in the form of not buying stock, was a tempting option.

To secure financing, turnpike organizers had to marshal more than the usual investment incentives. Various tactics were used to animate public spirit for turnpikes, including town meetings, correspondence, person-to-person solicitation, and newspaper articles. Thus social pressure was used to surmount

1819 (manuscript, New York Historical Society). The rates were increased by 56th sess., ch. 168 (1833).

⁶² T. F. Leilich, “The Owego & Ithaca Turnpike Co., 1807-1840,” p. 6 (unpublished manuscript, 1915, available at Tioga Co. (NY) Historical Society); Third Great Western Turnpike (manuscript papers, New York State Historical Association).

the free-rider problem. An 1820 newspaper article encouraging support for the New Paltz Turnpike indicates the nature of these efforts (*Poughkeepsie Journal*, 12 July 1820, p. 3). The article says that “the *interest* if not the *reputation*” of Poughkeepsie depends on raising the needed money:

[I]t can only be done by the stock being distributed very generally among the inhabitants of the village—each finding a motive to take a little, not from an expectation of its being productive (though it no doubt would pay something) but from an expectation that the investment would be returned with treble interest, in the addition which would be made to business and the value of property.

The editor of the newspaper prefaces the article by saying that “[i]t will really be a matter of most serious regret, and we had almost said indelible disgrace, if our village cannot raise 3 or 4000 dollars to effect an object of such great and lasting importance to its prosperity.” Klein (1990) details similar examples of moral suasion (including items from Elkanah Watson).

The effectiveness of community boosterism is remarkable given the bleak financial prospects of turnpikes. From 1810 through 1845 between 75 and 95 New York turnpike companies were chartered and successfully constructed. Each such company represents a successful case of the voluntary provision of a public good.

But for present purposes it is the failures that concern us. Of about 440 projects initiated in New York through 1845, between 60% and 65% failed to construct enough roadway to justify the opening of a single tollgate. The problem was a deficiency of willing investors, resulting from the bleak prospects of the stock (and the less than compensating efforts at community boosterism). In addition to this high failure rate, we may wish to contemplate the increased demand for charters that would have existed if turnpike stock had been more remunerative. On the other hand, a charter might have been a device for discovering the interest of the community in such a project. A failed company might simply be the artifact of testing the waters when genuine need for the project was small.⁶³

The Effectiveness of the Turnpike Plan

The organizational advantages of turnpike companies relative to public road care did indeed translate into better roads. The ever suspicious gazetteer Horatio Spafford (1981 [1824]:17, 125) concedes grudgingly that “if evils or inconveniences have been found in the speculating extent of the turnpike system, that system has also done much good.” Elsewhere

⁶³ We are grateful to Charlie Calomiris for this point.

he remarks that turnpikes have been "an excellent school, in every road district, and people now work the highways to much better advantage than formerly." In case law, judges said that turnpikes were "valuable and meritorious enterprises" and that they further "the advancement and prosperity of the commercial, manufacturing, agricultural and social interests of the community."⁶⁴

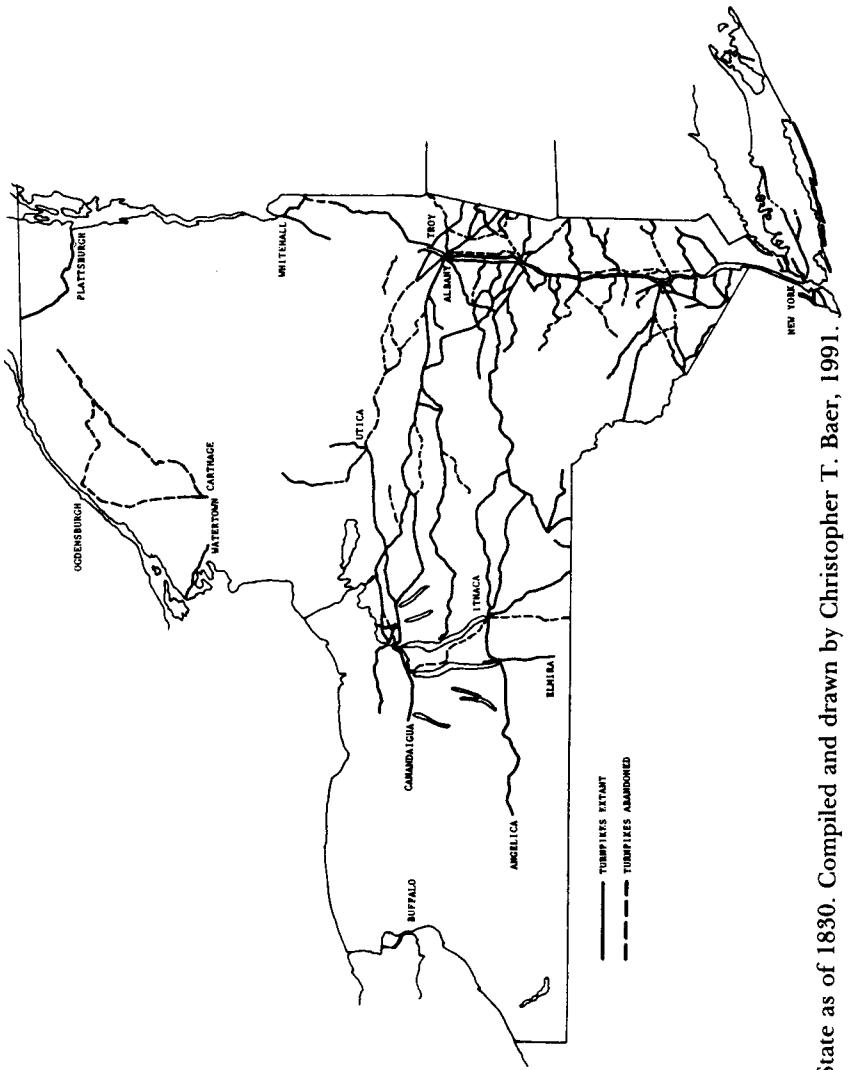
The extent of the system is reflected in Map 2, which shows the turnpikes that existed up to 1830. In 1831 an Assembly committee remarked fairly that turnpikes "have become so numerous as to intersect every portion of the State" (Assembly doc. no. 332 (1832)). One can see that the turnpikes of the time were mainly either routes to the Hudson Valley or components of the major arteries reaching into the western counties. Of the turnpikes charters through 1845, roughly 165 had been built, partially or wholly. Although turnpikes were a marked improvement over the alternative, people continued to complain about their condition. British writers, for example, were "unanimously unimpressed" with New York turnpikes (Haydon 1982:15). In part people held turnpikes to a higher standard, but in addition most turnpikes were cash-starved and simply could not keep the road in respectable shape. Perhaps company officers shaded too much on upkeep in order to make dividend payments, as some insinuated. Flagging conditions often attracted the gaze of the turnpike inspector, who would order the gates open, pushing the company into further financial hardship.

Turnpikes were indeed a community improvement. They were markedly more effective than alternative methods of road care, and their benefits redounded throughout the community. Had turnpikes been more profitable, the movement would have been enhanced both in quantity and in quality, benefiting more communities. Inasmuch as turnpikes merely redistributed rather than created wealth, grounds for remorse are undermined. It is hard to assess this factor, but we are inclined to think of it as a minor countervailing point. And if, from the statewide viewpoint, turnpike construction should have been dampened, making all turnpikes unprofitable hardly seems like the appropriate way of doing so.

The Continuing Struggle to Build Roads

The first decade of the turnpike movement in New York set the broad terms for toll-road operation for the entire movement. A fascinating petition from 1819 says that the public insists on "the proper formation and maintenance of the road,"

⁶⁴ Chief Justice Nelson in *People v. Kingston & Middletown Turnpike Rd. Co.* 1840:193; Justice Gridley in *Benedict v. Goit* 1848:467.



Map 2. Turnpikes of New York State as of 1830. Compiled and drawn by Christopher T. Baer, 1991.

although from the inadequacy of toll revenue, “such a result . . . is utterly impracticable.” They explain that a turnpike is necessarily monopolistic, so regulation is in order, but the petitioners are pessimistic about the legislature’s ability in “justly graduating the tolls of the different companies to the exigencies of the case, arising out of the unbounded varieties of climate, soil, distance of materials, price of labor, and other innumerable local circumstances.” Hence there arises “a ceaseless strife between the public and those corporate bodies,” and “in a vast majority of cases, the turnpike companies are the great sufferers.” The petitioners develop an argument that merits quotation:

It by no means, however, follows [that] because the companies are, in these majority of instances, losers, . . . the public has been a gainer. As soon as the tolls fail to produce a sum sufficient to repair the wear and tear of the road, the road will be neglected, although it may not become impassable. It is true, the legislature has attempted . . . to force them to open their gates whenever their roads are out of repair. Yet, from the nature of the law, it is one not very likely to be strictly executed; and even if strictly executed, only affords the traveller the poor consolation of passing over a bad road, without payment of toll. . . . [T]he law passed for his protection is only an additional evidence of the impossibility of forcing an expenditure of money, where there is not a prospect of an adequate return.⁶⁵

Throughout the 19th century toll-road companies relied on community boosterism to get off the ground, and once launched they carried on in a state of financial hardship.

In 1825 canals began killing off many of the turnpikes. Railroads joined in a bit later. In 1838 the legislature amended the turnpike law (61st sess., ch. 262, 254), stating that whenever a turnpike company is dissolved, the road shall become a public highway. Between 1825 and 1845 turnpike mileage dropped considerably. At the same time, however, the canals and railroads stimulated new demands for shorter toll roads that would serve as feeders. Chartering continued, but building and maintaining these roads was a struggle.

The frustration with cash-starved turnpikes helped set the stage for the plank road mania (1847 to about 1853). A plank road was a toll road surfaced with wooden planks. People hoped that this new surfacing would answer their prayers for affordable roads, but those hopes were dashed when it was found that the planks wore out twice as quickly as experts claimed (Majewski et al., in press; Klein & Majewski 1991). Plank roads were abandoned or converted into turnpikes. Dozens of short turnpikes persisted until the turn of the century,

⁶⁵ Angelica-Hamilton Trust Proposal, p. 15 (cited in note 20).

when a new public sector effort, associated with the Good Roads Movement, closed down the remaining turnpikes.

IV. Conclusion

Sorting Out the Pieces

We have investigated three questions:

- Why were turnpikes unprofitable?
- Why did people invest in turnpikes?
- Were the turnpikes wisely regulated?

We do not have simple and definitive answers to these questions. Let us consider each in turn.

Turnpike unprofitability can *in principle* be explained in four distinct ways:

1. Turnpike officers did not seek profit. They viewed the turnpike as a philanthropic cause, even a symbol or monument to the community. They may have felt, as others surely did, that it was unseemly to profit from turnpike stock and therefore desisted from actions that would have enhanced profitability.
2. Travel demand was insufficient to repay turnpike investors.
3. Shunpiking was rampant and unavoidable; even under the most favorable laws for combatting shunpiking, toll evasion would be widespread.
4. State regulations hamstrung the turnpikes. Turnpikes labored under the peremptory upkeep law, rigid toll rates, inadequate countermeasures to toll evasion, considerable concessions to local users, and a "settled hostility" at the many edges of turnpike operation.

Our feeling is that each of these explanations plays an important role. We cannot say that one in particular was the "real" cause of unprofitability. Explanation 1—community-oriented control—probably deserves the least weight. We know that in at least a few cases in the northeastern states people were willing to garner profits when they could. Explanation 2—insufficient demand—certainly applied to many projects, but we must ask why so much effort would be put into projects that could not pay for themselves even hypothetically. Explanation 3—shunpiking—certainly played a role, but it is hard to say how large. Explanation 4—regulatory hamstringing—is quite plausible, but whether it accounts for one, two, or three quarters of the explanation we are not prepared to say.

Two distinct reasons can be given for continued construction of turnpikes:

1. People believed that turnpike stock would pay. This hope may have been hometown foolishness or, for certain turnpikes, failure to foresee the devastating competition that would arise from canals and railroads.
2. People put money into turnpikes mainly to effect a local improvement. Improved transportation would facilitate trade and increase land values. The individual contributed out of social pressure, the participatory ethic, or public spiritedness.

Again, both explanations deserve significant weight. The first, however, is limited by the continued chartering of turnpikes after unprofitability was manifest and by the fact that unprofitability was typical even before the canal era.

The answer to the third question—Were turnpikes wisely regulated?—hinges on the answers given to the first two. Since we do not have pat answers to the first two, again we must be vague. Inasmuch as overly stringent regulation caused turnpike unprofitability, in turn leading to fewer socially desirable turnpikes, regulation was unwise. We are inclined to see this dynamic as playing a substantial but not overwhelming role. We are not saying that zero regulation would have been best, only that regulation went too far in serving the turnpike remonstrators, whose interests were visible, immediate, and politically sensitive. In contrast, the bad consequences of overregulation—roads that were decrepit or never built—were diffused, delayed, and attributed to other causes.

The Economy, The Community, and the Law

The turnpikes serve as the outstanding example of the early American public service business corporation. In community embeddedness, financial performance, and sheer number, they exemplify the Handlins' "commonwealth corporation." The turnpikes were born of economic ambitions. They far surpassed the public system of road care in organizational effectiveness, and these benefits were realized at a time of eager aspirations. They are prototypical of Hurst's idea of the corporation as an advanced form of contract designed to marshal private capital and managerial effectiveness, combined with special state-given powers. But much of the community was unprepared for the idea of private companies demanding toll for road travel. The mere term "corporation" struck an unfriendly note, and prejudices against turnpikes were excited in

public debate. The reality was a social setting of suspicion and occasional hostility.

A citizen with antiturnpike sentiments could bring them to bear in a variety of ways. Official actions included petitioning the legislature to act against a turnpike, remonstrating against a turnpike petition, being an assessor in a land settlement, being a juror on a case involving a turnpike, complaining of the turnpike condition to the turnpike inspectors, and speaking against turnpikes in town proceedings. Unofficial actions included evading tolls, opening a shunpike through one's property (or permitting a shunpike to emerge), and writing or speaking against turnpikes in public. Public officials—including legislators, state officials, justices of the peace, judges, turnpike inspectors, and town commissioners of highways—all had their opportunities to express antiturnpike sentiments in official actions.

Many voices were heard on turnpike issues. Some can be lumped together and styled as "the community," some as "the economy." It is a coarse and problematic distinction—sometimes both voices would emanate from the same larynx. But history is messy. We have suggested here how the economy and the community interacted in the creation of law.

Parts of our story are at variance with the stories of other scholars. The Handlins portray the early public service corporation of Massachusetts as a rather placid, consensual organization wisely sculpted by the regulatory powers of the responsive state. "In internal improvements," they say, "incorporation spread rapidly and without serious conflict."⁶⁶ Yet we have found that New Yorkers often disagreed over turnpikes and regulation seems to have been overly severe, to the detriment of turnpike profitability.⁶⁷

Morton Horwitz (1977) recognizes conflict in early national legal innovations. He uses a distinction, made earlier by the Handlins, between subsidizing economic development through the fiscal system and subsidizing through the legal system ("such as monopolies and franchises"). The latter, of course, was the norm in that day. Horwitz (*ibid.*, p. 100; cf. p. xv) says, "it does seem fairly clear that the tendency of subsidy through legal change during this period was dramatically to throw the burden of economic development on the weakest and least ac-

⁶⁶ Handlin & Handlin 1947:120; cf. pp. 55, 76, 78, 97. In discussing the Massachusetts turnpikes and their unprofitability, they say (p. 120): "[C]alls for aid rose up to the legislature. Again the Commonwealth benignly smoothed the way by enacting special laws regulating passage, by permitting changes in route, in construction, and in the location of gates, by extending building time, by adjusting tolls, and by allowing the roads to abandon unprofitable sections." We doubt that the Massachusetts lawmakers were as benignly responsive to turnpikes as the Handlins make out.

⁶⁷ Throughout the country turnpikes were usually unprofitable; see Klein 1990:791-93.

tive elements in the population.” He goes on to impute regressive motives to the choice of subsidization through the legal system. Our story of turnpike companies—the leading form of business corporation of the day—suggests that turnpike opposition was not only voiced but was effective in restricting turnpikes and exacting liberal concessions. If anyone felt “the burden of economic development,” it would seem to have been those who poured thousands into worthless turnpike stock.

The fact that liberal concessions were made to the local users runs contrary to Harry Scheiber’s point (1975:99) that “rivalistic state merchantilism tended to militate against effective regulatory policies that would have placed firm controls, for well considered and defined ‘public interest’ objectives, upon private enterprise.” We have suggested that the regulation of the New York turnpikes may indeed have failed to serve the public interest, but if so it certainly was not for a want of firm controls.

Anticorporate ideology and cumbersome, inflexible regulation help explain, though only partially, the nature of many of the early American business corporations—namely, public service organizations operating under financial distress.

Appendix 1

Source Materials for the New York Turnpikes, 1797–1845

Records pertaining to the turnpikes of New York are rather incomplete. Unlike some states (such as Pennsylvania, Virginia, and Ohio), New York State did not invest in turnpikes, so turnpike records were not official public business for archival preservation. Except for the odd surviving item, those petitions and financial records the state did gather from turnpike companies have since perished, probably in the State Library fire of 1911. When a turnpike sought permission to erect tollgates, state commissioners would file inspection reports and the governor would issue a license to companies that passed muster, but again no such records have survived.

The richest source of information is the Session Laws, from which much can be inferred about the progress of a turnpike project. Other legislative sources include the *Journals* and the *Documents* volumes. Even the New York State Library is missing many of the volumes in these series. The *Journals* are extremely terse and badly indexed (when indexed at all).

Case law from the New York Supreme Court is enlightening both for general observations and for information about specific turnpikes. Other sources that help to determine whether a chartered turnpike was in fact constructed are state gazetteers (1813, 1824, and 1836), city directories, and contemporary maps. Other contemporary sources include pamphlets, periodicals, miscellaneous reports, letters, diaries, and scrapbooks. Extensive company records have survived for only four or five companies. These records are found in the New York State Library (Albany), the New-York Historical Society and the New York Public Library (both in New York City), the New

York State Historical Association (Cooperstown), and the Columbia County Historical Society (Kinderhook).

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THE FEDERAL ROLE IN SURFACE TRANSPORTATION

**A REPORT OF A PUBLIC POLICY FORUM
DECEMBER 2002 WASHINGTON, DC**

ENO FOUNDATION

prepared by

**Steve Lockwood
Parsons Brinckerhoff**

**Damian Kulash
Eno Foundation**

THE FEDERAL ROLE IN SURFACE TRANSPORTATION

I. PURPOSE AND HISTORICAL CONTEXT

Purpose and Approach. As the federal aid program enters the 21st Century, it is appropriate to consider issues of change vs. continuity in the role of the federal level of government in highway transportation as it evolves to meet current and future needs. Important economic, geographic, social and environmental developments are taking place that imply a continuing vital federal role – but one that must adjust to the changing context. The Federal Highway Administration (FHWA) Office of Policy seeks to anticipate forces that may require such changes and sponsored this study to suggest opportunities where policy research can assess the need for new or modified federal roles in the federal-aid highway program.

The study uses illustrative emerging issues to identify topics that might warrant increased focus in future FHWA policy development.¹ The body of this report is based on a one-day forum in which 20 high-level professionals with diverse interests related to surface transportation considered the changing context of transportation and challenges that the future might bring. To make these discussions manageable, an extensive set of potential issues was developed prior to the forum and used by the participants to narrow the discussions to a few representative ones. This short list was then used to prime a wide-ranging discussion and to extract possible areas where research might assist future policy assessments.

Changing Context of the Federal-Aid Program. Because transportation is essential for economic activity and social interaction, governments have a strong interest in seeing that it adapts to changing needs, that all citizens share its benefits, and that it reinforces public policies in economic, social, defense, environmental, and other areas. As national priorities shift and as technological capacity and demographic conditions evolve, transportation needs to adjust to meet new circumstances.

The national transportation system is a partnership with key private and public sector components. The private sector plays a dominant role in vehicle production and in the actual carriage of goods and people. Public sector organizations -- state and local governments -- build, own, and manage roads and many other facilities. In this context of shared private and public responsibilities, the federal interest is inextricably intertwined with state and local governmental interests and with private sector interests of

¹ This report was prepared for the Federal Highway Administration by Stephen Lockwood of Parsons Brinckerhoff and Damian Kulash of the Eno Transportation Foundation drawing upon discussion with the panel of experts listed in Appendix B. This Report was prepared in 2002

many types. These interconnected, shared interests pervade every sector of economic and social activity. Within the American governmental tradition, the federal interest has focused on key concerns of an inter-state or national nature (economic development, defense), issues of common general concern (health and safety) or problems of efficient and equitable use of public resources. The continuing evolution of what constitutes economic development, sustainable environment, national security and mobility needs and the appropriate federal role in transportation requires adapting historic roles to embrace the special implications of current social and economic trends, new technological potential, and other emerging developments.

Evolving Federal Role in Federal-State Partnership. As times change, it is necessary and appropriate that the federal role in surface transportation be adjusted to accommodate new developments and pressing needs of the day. What are the current priorities compared to the needs and developments that lay over the horizon as we try to focus on them in 2003? What are the emerging issues and trends during the next 10-20 years to which the federal aid program should respond? Are there inherited programs that are outdated in light of current developments? Should the respective roles of the Federal Highway Administration, state and local government, the private sector or other entities be adjusted in light of changing issues and intergovernmental capacities? Are the instrumentalities of the federal role (grants, regulations, oversight, professional capacity building, research) still relevant? What about the federal aid financial relationships and how funds are distributed and administered? How do these questions fit within a host of legal, policy, and political considerations? Such broad questions can never be fully and finally answered, but actions that are taken now must take account of them insofar as this is possible.

Beyond Reauthorization: Policy Research. As a practical matter, the “big questions” governing the directions of surface-transportation policy get addressed, albeit only indirectly or incrementally, when the nation reauthorizes its surface transportation programs every five years or so. At these periodic intervals transportation programs are typically revised – usually reactively – to reflect the altered stakes of key players and emerging issues that must be accommodated. Consideration of the broader issues mentioned above is difficult as legislative specifics are being drafted to deal with pressing immediate issues and as diverse stakeholders compete for attention.

To come to terms with the larger questions, it is helpful to begin by looking further out -- five to ten years -- and ask if the federal role as it is currently structured is well suited to anticipated future needs. Are there areas where changes might be appropriate? What objective and instrumentalities might be adjusted or added? How might changes in priorities, program, relationships and financing affect the effectiveness and the varied objectives of transportation programs? How can such issues be best addressed within the existing institutional context? To support a future dialogue on such issues, background policy research can be conducted now to help inform policy makers as they consider possible realignment of the federal role in future legislative cycles. This is the approach applied in this study.

In doing this, it is useful to begin by looking back at how the federal role got to where it is today, and then to focus on current issues and where the federal role may go tomorrow.

Federal Role Rationale. The Federal Government’s role in surface transportation, as in other areas, has evolved through a continuous series of steps, each of which responded to specific needs or various prevailing conditions. The tradition of “federalism” that prevails in the United States has deep historical roots. It can be traced to the U.S. Constitution, which sets out the rights and responsibilities in very broad terms. With respect to most transportation matters, this tradition reserves strong decision-making and ownership responsibilities in the hands of state and local governments. As the nation grew, the interconnections between transportation and economic development, regional integration, national unification, and defense have led to the articulation of an increased number of areas in which the federal government has an appropriate interest. The general principles that evolved regarding interstate commerce and national defense and general welfare, have been interpreted and reinterpreted repeatedly over the years as times have changed.

Historic Evolution of the Federal Role. Key aspects of the current division of federal and state roles in surface-transportation matters began early in the twentieth century with the Federal Aid Highway Act of 1916 and have persisted since. Three of these key features shape the framework of surface transportation legislation today:

- The federal government provides financial assistance for certain surface-transportation programs.
- The federal government also sets out institutional requirements that a state or local government must meet to be eligible for its financial assistance.
- State and local governments own surface transportation facilities and are responsible for planning, designing, constructing, maintaining, and operating them, in some cases with federal financial assistance and oversight.

Legislation in the mid-1950s added important additional dimensions to the framework. The Federal-Aid Highway Act of 1956 created dedicated funding for the Interstate Highway System. Responding to defense needs that became apparent during World War II and to the emerging need for improved interregional connections, federal assistance for Interstate routes was tied to specific, legislatively predetermined routes. Legislation that same year established the Highway Trust Fund, which created a link between highway program expenditures and receipts from highway user fees. The modern set of surface transportation programs includes formula distribution of federal financial aid in categories designed to focus on evolving national systems priorities and on maintaining equity, combined with requirements or incentives designed to foster a range of federal objectives in safety, efficiency, and environmental quality. In addition to program finance, the principal roles of the federal level in this intergovernmental context have been program oversight; facilitation of uniformity of geometric, signing, and operational practices; technical support in engineering, planning, research and professional capacity

development; and adaptation to safety and environmental priorities. The balances of Federal, state, and local transportation roles that prevail today reflect a transient equilibrium in this chain of evolution. The evolutionary process has never stopped, and there is every reason to suspect that it will continue to change. It has changed to serve varied national objectives, been linked to different modes of transportation, and has been applied through a range of administrative mechanisms, as illustrated by the selected key milestones shown in Table 1.

Table 1: Selected Milestones in the Evolving Federal Role in Surface Transportation

Program	National Objectives and Federal Role
Zane’s Trace (1796)	Issued land warrants for military and westward expansion
Cumberland Road (1806)	Appropriations for westward expansion
Gallatin Report (1807)	Planned routes and proposed funding to achieve political and economic integration
Development of rivers and canals (1809-30)	Made land grants and appropriations for economic integration
Transcontinental Railroad (1850-71)	Made land grants for westward expansion and political integration
Office of Road Inquiry (1893)	Research and promotion to improve metropolitan quality of life
Highway Acts (1916 on)	Made financial grants and encouraged institution building to improve rural economy
Highway Acts (1920s -30s)	Made financial grants to interconnect urban areas and regions
Public Works Administration (1930s)	Made grants for roadbuilding to create employment during the Great Depression
Interstate Highway System (1954)	Planned and financed highways for economic integration and national defense
National Environmental Policy Act (1969)	Established regulations to give priority to environmental objectives
Transit grants (1970s)	Increased flexibility of highway grants and made new grants to improve metropolitan quality of life
Economic Deregulation of Interstate Trucking (1982)	Eliminated regulations to improve efficiency, competitiveness of highway freight
Support for Intermodal Projects (1991)	Made financial assistance eligible to support integrated multimodal network
National Highway System (1991)	Expanded definition of core highway networks following completion of the Interstate Highway System

The Federal Role in the Future As apparent from the history of the federal aid transportation program, the federal role in surface transportation is dynamic and adaptive. It is anchored in Constitutional provisions and philosophies of government, but it has been very flexible in serving evolving government objectives, in reflecting changing times, and in addressing cyclical economic and political contexts. Where will this evolution lead next? Many directions are possible, driven by changing policy priorities, new technological opportunities, economic expansion, population shifts and growth, interconnected shifts in other forms of transportation, ups and downs in budgetary and employment cycles, and a host of other considerations. Only time can tell what the future will require, but it is useful to explore potential changes in the external context that might occur and how intergovernmental relations might shift. This exploration can help to anticipate and plan for the future; to ferret out future needs that must inevitably be addressed, to weigh program changes that might be desirable, or to map possible future stages in the evolution of the federal role. It can help responsible agencies be better prepared to serve tomorrow's demands.

II. POSSIBLE CHANGES IN THE FEDERAL ROLE ON THE HORIZON IN 2003: FOUR ILLUSTRATIVE ISSUES

As a first step in exploring key future forces that might reshape surface transportation, a large number of issues were postulated, all of which were matters receiving particular attention in transportation-policy discussions. Through an interactive screening process (detailed in Appendix A) the four illustrative issues shown in Table 2 were selected from a long candidate list for detailed discussion. These four issues were the focus of a day-long forum whose results are summarized in this report. The illustrative issues were chosen because they reflect important economic, social, operational, and environmental concerns and illustrate a variety of questions concerning federal roles and responsibilities in different surface transportation program areas. Clearly other profoundly important issues also affect the future of surface transportation; similar analysis of them might also identify useful areas of research.

Table 2: Four Illustrative Issues Examined in this Forum

A.	The need for increased capacity and improved interregional connectivity for long distance movement of goods and people in the post-Interstate era
B.	The importance of improved operations and management to make most efficient utilization of existing highway capacity
C.	The enormous social cost and public acceptance of persistently high automotive crash and fatality levels.
D.	Inconsistent federal interdepartmental policies that impose program delays and costs, particularly inconsistencies between mobility and environmental interests.

By focusing on a few selected issues there was ample time during a day-long forum for twenty diverse leaders to discuss them in depth. This discussion addressed the nature of possible changes to the federal role in each area suggested by each issue, the potential implications of such changes, the common themes they suggest, and ways that policy research can enlighten further consideration. The following four sections describe the illustrative issues that were selected to prime the forum discussions.

Issue A: The need for increased capacity and improved interregional connectivity for long distance movement of goods and people in the post-Interstate era. The Interstate Highway System program grew out of a national consensus in the 1940s and early 1950s that interregional connectivity was important for the collective good – in terms of providing a uniform level of interregional connectivity for an increasingly nationalized economy and national defense. Because the federal interest in the Interstate System was so much greater than in other State highway systems receiving federal aid at the time, major changes to traditional federal-aid highway program procedures were made in planning and constructing the Interstate System. These included a formal process to designate routes that would be on the Interstate System, development of

consistent design standards for those roads, funding the system on a cost-to-complete basis to assure funding would be proportionate to the estimated system cost in each State, creation of the federal Highway Trust Fund to serve as a dedicated and reliable source of funds to finance construction of the Interstate System and other federal-aid highway improvements, establishment of a 90 percent federal share of the cost of the Interstate System, and many other specific program features. This founding purpose has proven valid as recent economic analyses have documented the huge productivity gains and substantial rates of return that have come from this public investment. Although the system represents less than one percent of the nation's highway mileage, it now carries about one quarter of national highway traffic. However, the Interstate System is not serving all of the nation's concentrations of activity. Dispersal of population and regional economic development, growth of a decentralized service economy, and other factors have resulted in a distribution of economic activity and population that is now significantly different than when the Interstate Highway System was planned. Major flows of interstate commerce have emerged in corridors not served by the Interstate System or by other major state highways. Global economic shifts such as the globalization of production and trade and creation of the North America Free Trade Agreement have added traffic to new corridors and points of intermodal interchange such as ports, airports, border crossings and major terminals. These changes have been creating flows of goods in places that lack adequate transportation capacity to carry them. At the same time, Interstate Highways in and around metropolitan areas are becoming increasingly congested and concerns are growing about how the existing system will accommodate traffic growth projected for the next 20 years and beyond.

In recognition that the Interstate System no longer was adequate to efficiently handle the diffused patterns of interregional passenger travel and interstate commerce, the National Highway System (NHS) was created as part of ISTEA. While NHS goals of promoting interstate commerce and facilitating interregional travel were similar to those for the Interstate System, the level of federal interest, as evidenced by specific NHS program attributes, was much lower. No higher matching ratio was provided, no special or consistent design standards were specified, and in general there were few incentives for States to make improvements they would not otherwise have made except for the categorical program funds that were earmarked for the NHS. While the NHS program has, indeed, targeted federal funds at a limited system of national significance, it has had nowhere near the impact of the Interstate System. In general it does not function as an attractive alternative to the Interstate System except when service on an Interstate Highway is severely degraded.

In an increasingly global economy where-just-in time intermodal logistics is an important component of productivity, the lack of connectivity and the delays caused by congested corridors and nodes reduces the competitiveness of U.S. industry and becomes an issue of national concern. Is there a long-term need for a new, augmented, national interconnected network? Is the Interstate to be the "final" national system? States, through the NHS and other highway programs, confront the problem by dealing with pieces that fall within their borders, but such solutions may not mesh with the plans of other states, nor with

those of localities along the way. More importantly, these efforts have largely failed to provide the kinds of alternatives and augmentations to the Interstate System required by interregional passenger and freight traffic. If it is indeed a national priority to serve such traffic, does this warrant a stronger federal role, what should that role be, and what specific requirements and incentives would be required? While there appears to be a broad consensus on the national importance of this issue in light of the apparent inadequacies suggested above, how can a serious national dialogue on this issue be conducted?

Issue B. The importance of improved operations and management to make most efficient utilization of existing highway capacity. Our time-conscious society places an ever-higher premium on speed and reliability of travel, both for personal travel and especially for just-in-time freight transportation. However, the performance of the highway systems in metropolitan areas continues to deteriorate as congestion increases, spreads over more facilities and extends over longer periods of the day. Counteracting this deteriorating service through capacity additions is becoming more difficult as increased densities of land development, rising construction costs, heightened environmental sensitivity, and community concern about new construction have constrained widening and extending existing highway systems.

Furthermore, analysis shows that as much as half of the current delay is not due to permanent capacity shortfalls, but is temporarily lost because of incidents, construction, weather, signal mistiming, or other non-recurring or correctable operational features. This indicates substantial unrealized potential to improve performance without new construction -- by using the existing systems more efficiently. Indeed, new “systems operations and management” concepts supported by Intelligent Transportation Systems (ITS) technology suggest that we can “take back the capacity” lost to these non-recurring causes through improvements in systems operations and management. However, state and local governments have not yet effectively capitalized on this potential.

The institutional, programmatic and technical barriers and opportunities associated with improved systems operations and management are not well understood. This has not been an area of strong federal leadership. Unlike supporting the construction and preservation of interregional and other highways, there is no long-standing federal role in the operation of transportation facilities. To the contrary, until recently operations was considered to be strictly a State and local responsibility and federal funds could not be used to support many operational activities. Placing increased priority on the operation and management of existing systems thus represents a major departure for the federal-aid program that has traditionally focused on financial and technical assistance for construction of new highways and physical preservation of them. The traditional federal emphasis and its associated institutional orientation may inadvertently contribute to institutional fragmentation. Further, it may encourage states to focus on agency “outputs” measured in provision of physical resources rather than customer-related “outcomes.”

Meanwhile, private sector vehicle and electronics product producers are installing new vehicle-based telematics improvements that suggest significant potential payoffs in both safety and performance. Many of these improvements can benefit from interaction with highway infrastructure and its owner-operators. However, these national industries cannot be expected to deal with the many individual highway owner jurisdictions. Beyond research, a federally led partnering effort is an essential component to capitalize on the potential payoffs. In this, Europe is already ahead of the U.S.

As congestion has increased and as other countries have begun to demonstrate the potential of ITS and other system operations, there has been a growing recognition that the federal government does have a role in operations. Clarifying the appropriate place of operations in the federal-state partnerships and its legitimacy as a use of federal resources is a logical point of departure. This may include demonstrating that federal funds are even more effectively invested in operations than in the costs of infrastructure. The physical systems development orientation of the federal aid program history has led to a focus on “outputs” rather than “outcomes”. As traditional constituencies have historically rallied around capital investments, there has been a reluctance at the federal and state level to signal significant adjustments in priorities. Performance monitoring and measurement are weak in this tradition, despite the increased general government emphasis on accountability.

Federal leadership in institutional and technical development may be needed to overcome the absence of operations in program and organization that have developed around the historic emphases of the federal aid program. The full extent of that role is still being debated, however. Key constituencies – freight and passenger -- need help in recognizing their self interest in the provision of maximum service levels on existing facilities. Should special steps be taken, such as offering states incentives to demonstrate the full potential of integrated ITS deployment and operations? Given the role of public safety agencies in highway operations, what is the appropriate level of federal encouragement and support of greater interjurisdictional cooperation? To capitalize on advances in telematics, is federal leadership essential in developing new approaches to intelligent vehicle-highway infrastructure cooperation?

Issue C. The enormous social cost and public acceptance of persistently high automotive crash and fatality levels. With more than 40,000 highway deaths each year and huge numbers of injuries, transportation ranks among the nation’s top causes of death and disability. Similar casualty figures from war or crime would stir massive public outrage, yet the public puts up with the immense toll of fatalities, injuries, and property damage as one “price” of highway travel. This acquiescence is all the more surprising in the face of potential opportunities to improve safety by a more aggressive and integrated approach.

Enforcement efforts are now being aided through new technology now available to address some safety problems such as red-light running or speeding, but public reactions have often taken the form of resistance to use of those technologies. Engineering

innovations to improve safety have been a major focus of design for freeways, but as these become increasingly congested their traffic is being diverted to less-safe arterial highways. In-vehicle crash avoidance technologies promise to reduce key causes of crashes but federal cooperation with vehicle manufacturers in such developments is modest. Public education has been invoked, but accident rates among the young are the highest. Technical fixes at the level of voluntary compliance or individual market transactions are clearly inadequate. The US is no longer the international leader in reduced fatality rates.

Should such a situation be considered acceptable? Should we have more aggressive targets? Where should leadership come from? Is this a technical, political or cultural problem?

At the national level --where safety concerns have been declared top priorities for years in highway policy -- leadership and coordination are lacking. Programs focusing on infrastructure, vehicles, enforcement, and human factors are dispersed among several agencies, policy is decentralized and federal targets have been modest. States and local governments, which are closer to the citizens and ultimately have to implement federal policies to improve safety, often feel the political pressure more than the federal government and may be unenthusiastic about or outright opposed to pursuing politically unpopular programs. Many states still lack primary seat belt laws and motorcycle helmet laws despite their demonstrated efficacy. Courts have exerted little appetite for the imposition of stiff penalties for traffic violations, even if those violations are recognized to be contributing factors to high traffic fatality rates. The relevant professional communities have not mounted campaigns equivalent to their support for combating diseases with lesser mortality implications. The public at large is not energized by leadership or the media on this issue as in the case of other public health areas of significantly lower proportions,

Fragmented, the current modest levels of engineering, enforcement and education are clearly not enough where apparent trade-offs with personal freedom or institutional prerogatives are at stake. In particular, institutional fragmentation – while responsive to separate political and bureaucratic constituencies -- may have undercut the synergy and impacts among the array of programs that aim to improve safety. Perhaps new forms of collaboration among public agencies in the transportation, enforcement, medical, and social-services fields and among private motor-vehicle manufacturers, insurers, carriers, and other industries may be needed to reach new safety plateaus. Some countries have even altered or combined the roles of public and private sectors in highway safety: could these signal avenues that could have promise in the United States?

The central challenges therefore seem to be both political and cultural. Perhaps the policies, practices, and their results in other countries need to be researched for lessons suggesting possible paths for the United States. How have other countries framed the risks and related social issues to their publics? What kind of visibility and priority has highway safety been given with in various institutional media, public and private? Have

the relative risks of motor vehicle-related fatalities been sufficiently framed as a medical problem in today's increasingly health-conscious society? What should be the expected source and mechanism to provide leadership on this issue?

Issue D. Inconsistent federal interdepartmental policies that impose program delays and costs, particularly inconsistencies between mobility and environmental interests. Even as the mobility objectives of national highway development have been pursued the environmental costs of highway transportation have increasingly become a dominant issue. Highway-induced environmental damage is demonstrably tied to road use and road construction. Environmental sensitivity in many areas has advanced in recent years and highway-development policy has increasingly been tied to policies focused on environmental and community priorities. Major strides have been made in many areas such as noise, air quality, aesthetics, preservation of wetlands, and protection of biodiversity. Nevertheless, in some cases, the separate objectives of environmental and transportation programs have come into direct conflict, reflecting divergent program focus and constituencies. While the public expresses its support for both better transportation and a better environment, achieving a working balance in complex situations is difficult. Many transportation and environmental laws trace from separate legislative origins and statutes. Constituencies are often non-overlapping.

Inconsistencies in legislative intent and agency regulations have resulted in uncoordinated and burdensome federal agency regulatory procedures that must be followed if new facilities are added. There are six federal cabinet departments and three independent agencies involved in administering at least 65 separate laws that impact highway development – not to mention separate state level regulations. Program complexities imposed by conflicting federal interdepartmental policies, uneven levels of devolution to state agencies and administrative inconsistencies have further delayed projects and increased their costs. Project opponents have occasionally used environmental regulations as weapons to delay or discontinue projects; project proponents have sometimes turned to approvals from previous eras or the availability of funding to force through projects without patience for environmental reconsideration.

Many states have greatly improved their capacity to serve as effective environmental stewards but the various environmental statutes in place have been interpreted and reinterpreted in courts with the result that multi-agency federal provisions apply even to small projects. These can lead to delay and inefficiency in good circumstances and to paralysis in others. Federal agencies with conflicting missions and adversarial approaches may not be the most effective way to balance mobility and environmental objectives. Yet no clear mechanism appears available at the federal level to resolve such conflicts that both preserves the importance of clear process and does so in a timely manner. In the late 1990s Congress directed a streamlining initiative that did not survive the rulemaking process but has resulted in further clarification of thorny issues. While a recent Executive Order on Streamlining has taken key steps to focus on streamlining for

major projects and is supporting a variety of state efforts, the larger issues of federal interjurisdictional cooperation, devolution of responsibilities, distinguishing among significant and minor environmental impacts remain. Can research assess the potential of focusing more coordination and decision forcing authority within the US DOT while at the same time devolving more responsibility to the state level?. Clear process separation of problematic projects from those with little or no environmental concern reduce schedules and costs?.

III. KEY THEMES AND RESEARCH THAT MIGHT HELP ILLUMINATE THEM

The implications of the four emerging issues sketched in Section II revealed a set of major themes with broad implications. Rather than recount these discussions in an issue-by-issue fashion, this section summarizes them in eight themes that stood out prominently during these discussions. They tended to be general concerns or developments that spanned several of the specific illustrative issues. This section discusses these themes and explores possible ways that research might help address them. The eight themes are introduced briefly in Table 3.

Table 3: Key Themes Resulting from Forum

<p>1.</p>	<p>High costs and uneven distribution of major network upgrade projects</p> <p>With the completion of the Interstate Highway System states and localities increasingly face large, complex, one-of-a-kind projects that do not fit neatly within the established categories of federal-aid assistance and which are too expensive to complete using only the amounts distributed by formula within these categories. These investment needs are concentrated in a limited number of geographic areas but the benefits of improvements extend to broad regions of the country.</p>
<p>2.</p>	<p>Using public funds on projects whose benefits are concentrated on particular beneficiaries</p> <p>As surface transportation needs become more varied with many site-specific issues, projects involving public private partnerships that benefit particular subsets of people or businesses are becoming more common, This is particularly for intermodal improvements were federal credit assistance supports private investments . Public assistance to such projects must be structured in ways that are equitable and that do not distort competition between regions, modes, or carriers.</p>
<p>3.</p>	<p>Evolution of new, adaptive institutions</p> <p>During earlier years of surface transportation development, states and localities had numerous projects within their respective jurisdictions and federal assistance for surface transportation flowed to organizations whose reach was appropriately matched to the needs. Proposals to finance specific key corridors, to develop Intelligent Transportation Systems, and to take on major intermodal projects have shown that new organizations are sometimes needed to go beyond established jurisdictional boundaries in order to address the needs.</p>

4.	<p>Reconciling competing mobility and environmental objectives</p> <p>As surface transportation has matured from its developmental stages and environmental concerns have gained increased national priority, a body of environmental statutes has grown up surrounding transportation projects. The regulatory process that has emerged is cumbersome and inefficient, very procedurally oriented, and insufficiently able to distinguish routine situations from those where special handling is required.</p>
5.	<p>Inability to make quantum leaps in improved safety</p> <p>Sustained attention by policy makers, numerous government agencies, and a host of other organizations has produced important gains in safety. Nevertheless, more than 40,000 lives are lost on U.S. highways year after year. Despite pronouncements about the high priority given to improving transportation safety, the U.S. does not appear to be as aggressive in pursuing improved highway safety as some other countries.</p>
6.	<p>Incentives for improved performance</p> <p>Surface transportation assistance in the United States has generally evolved in a needs-based fashion. Funding formulas implicitly reflect needs rather than how effectively or efficiently funds are being administered and spent.</p>
7.	<p>Economic importance of freight</p> <p>Global trade and industrial innovations such as just-in-time production have rekindled awareness of the economic importance of reliable and efficient freight transportation. As economic growth and international trade continue to advance, the nation's surface transportation system may be hard pressed to provide the capacity and inter-connectedness that will be required.</p>
8.	<p>Future role of national network</p> <p>The Interstate System was planned 60 years ago. Economic development and population growth are becoming increasingly dispersed and existing highway networks are not serving demands for interregional transportation efficiently or effectively.</p>

1. High costs and uneven distribution of major network upgrade projects

During the development of national transport networks, whether rail, post roads, aviation, or Interstate Highways, many states and localities shared very similar needs for new transportation facilities and a desire to be interconnected regionally and nationally. From the initial years of annual federal financial assistance to surface transportation in 1916 to a decade or so past the financing of the Interstate Highway System in 1956, similar needs and conditions were the norm in surface transportation: right of way was available; facilities designs were more or less standardized; federal technical assistance was available; and environmental and community impacts were perceived as minimal. In these years access considerations tended to outweigh the problems associated with nearby facilities, and there were numerous proposed additions of a similar nature.

Starting during the 1970s, as major parts of the Interstate Highway System were completed and environmental concerns grew in intensity, this picture changed significantly. While there were still many needs for new capacity, many were not matters of regional connectivity but could more accurately be characterized as relief for major bottlenecks in the existing network or extensions to it. That situation still exists today. While a number of states have identified key corridor improvements to provide improved connectivity required for efficient freight movement and economic development, many more have a backlog of major interchanges and other chokepoints on their priority improvement lists. There is a substantial federal interest in eliminating many of these bottlenecks because they impede interstate commerce as well as local traffic.

Solutions to these bottleneck problems may be quite complex and require balancing transportation, environmental, and urban or regional development considerations. The resulting projects are often very expensive. They have widely-distributed benefits that may extend throughout the national network, but their costs are concentrated at a specific location or link. This makes them difficult to program using constrained, formula-based funding sources. Some regions have worked out plans to reconcile these controversial matters and have projects ready to go; others have not.

Unlike previous eras when federal financial assistance could be spread by formula among states for similar types of work, large portions of current and future federal financial assistance requirements are for a small number of very high cost projects. This makes it more difficult to maintain a broad consensus on national transportation priorities. It also confounds the notion of a “fair” distribution of resources among states and regions. The traditional formula based program is designed to spread federal assistance across the fifty states. It is implicitly predicated on each state having a mix of projects that are somewhat similar in scale from state to state. This model does not address today’s emerging “lumpy” needs very well. Increasingly, policy makers face the situation where a few states have potential projects with very high price tags, while others have none.

If many states face investments that can be met using their apportioned share of federal-aid funds, then formula-based distribution of federal financial assistance can be effective and fair. If instead a significant portion of available federal funding would be consumed by a few large projects, formula-based distribution can become inappropriate. States without large projects would be left out if some category of funds went only to huge-scale projects. Yet more broad-based, “equitable” distribution of funds to all states would make it impossible to focus funding efficiently on the special needs of such mega-projects. To be both fair and efficient, the federal role might be restructured to be that of a banker. States that need disproportionately large allocations to meet the needs of mega-projects might, in effect, receive federal “loans” and pay them back through foregone future program grants or some similar mechanism.

The case for a federal “banker” role is further strengthened by the fact that large scale transportation projects are often parts of larger developmental packages. As a result, widely different proportions of the overall project budget may be the result of non-transportation community improvements from one project to another. Such multi-purpose development is in keeping with good planning practices, but the nation’s transportation interest in different projects varies. Keeping federal assistance equitably distributed and focused on transportation priorities in such circumstances involves case-by-case consideration. While it is desirable to make the federal share of project costs somehow proportional to the national transportation interest in them, there is no ready, automatic way to do this because each project poses a unique mix of local, regional, national, carrier, and shipper costs and benefits.

Does the federal role need be redrawn to deal with these complexities? Difficulty in raising the necessary funds can delay or defeat states and communities planning large-scale projects. Yet such projects can be critical to the performance of national networks. Should some additional form of federal financial assistance be available so that certain large-scale projects, which are otherwise outside the reach of federal assistance, become possible? If direct federal grants are inappropriate or inefficient for this purpose, can a loan program provide the incentives and assurances needed? If only a few states are able to obtain federal loans at any particular time, are there realistic ways to offset this apparent inequity? For example, it may be possible to make assurances of similar access to financing to other states downstream, or by somehow computing the estimated net federal contribution to the project and charging this against a state’s share in formula-based programs.

Policy research could be useful in:

- Developing tools to estimate the national, regional, corporate, and other interests (both benefits and costs) in expansion of corridor capacity and alleviation of bottlenecks.
- Reviewing case history with state infrastructure banks to identify features that led to heightened use of available resources and features that may have deterred investment.

- Documenting the extent to which the administration of contract authority and obligations has been sufficiently flexible to keep up the needs.
- Identifying the number and improvement costs associated with major interstate bottlenecks, perhaps expanding upon the list already put together for the Highway Users Alliance.

2. Using public funds on projects whose benefits are concentrated on particular beneficiaries. The increasing importance of intermodal transportation in the nation's economy introduces additional complexities into the traditional federal aid financial context. Freight transportation improvements bring benefits to specific private shippers, transport companies, and special purpose self-supporting authorities. When such projects are undertaken, some competing carriers, shippers, terminals, and regions will be made better off and some may be placed at a competitive disadvantage. While transportation improvements have always affected different parties to different degrees, traditional federal assistance programs have been so broadly based and the resulting projects serve such general purposes that their effects on carrier competitiveness have not been a key concern. This is not the case for many intermodal projects.

Innovative financing applied to freight related improvements are being based on public – private partnerships in which the private partners and utilizing revenues from the jointly funded improvements. In effect, the public sector is subsidizing improvements that can bring substantial advantages to a few identifiable carriers and may place their competitors at a distinct disadvantage. For example, improvements to a major freight corridor – facilitated through federal support -- might benefit one or two railroads or barge operators and a small number of shipping lines whose traffic moves in that corridor; other railroads, barge operators, and shipping lines might become less competitive in the process. Such distortion can be unfair and inefficient. To avoid undesirable competitive impacts, it is essential that the costs of the projects be fairly distributed among the beneficiaries. While the effects on all of affected concerns usually will be equal, it is nonetheless important to recognize and address this set of concerns when financing terms are drawn up. In the case of intermodal projects, this may mean partial reliance on special user fees and issuance of bonds against that revenue stream.

In addition to very pronounced effects on transportation companies, intermodal projects may have distributional consequences that differ sharply from conventional system improvements. If an intermodal investment improves service through a particular port, terminal, or rail line, some communities may benefit from the extra jobs or business that are created while other communities may suffer the disruption of more traffic passing through their community without any of the associated benefits. Unlike traditional transportation investments, where construction is welcomed because of its associated local benefits, intermodal investments may be resented by communities that are, in effect, being asked to pay the price for benefits that are going elsewhere. One way of offsetting such inequities is to add project features that diminish them or compensate for them. Such features typically add to overall project costs, and further confound the difficulty of sorting out local, regional, and national benefits.

There is no simple, single way to resolve all the complications of intermodal projects. Given the diversity of beneficiaries, investment vehicles, cost-recovery techniques, and impacts, innovative approaches are needed to combine targeted federal and state support with private and local investment in tailor-made packages that are equitable and efficient. Such techniques may include federal loans or credit support so that project beneficiaries can gain access to the necessary capital while leaving the ultimate financial burden on the companies and communities where it most appropriately belongs. Financial self-sufficiency may rely on future payments of user fees, so that the carriers who benefit from a project are kept on a level playing field with competing carriers whose route networks do not include the improved corridor. To date such federal participation in innovative finance of this sort has been limited to a few large-scale custom-designed projects.

Efficient transportation by all modes is a federal concern. In particular, an integrated, multi-modal national transportation network is essential to interstate commerce, a clear federal interest. Numerous policy announcements from DOT leaders and transportation

study commissions have recognized this federal interest, but it has been difficult to harness in action. Much of the “national transportation network” is in the private sector and there has been little enthusiasm about a federal role in planning it. Starting with the Intermodal Surface Transportation Efficiency Act of 1991 federal policy seized upon intermodal projects as a way to broaden a familiar federal role – highway project financing – to address a subset of the “national transportation network” where the need for federal involvement appears is generally accepted. In spite of their increased eligibility for federal assistance, very few intermodal projects have actually been funded using the expedient. Progress toward the underlying national purpose – an efficient, integrated, multi-modal transportation system – may be hastened by adapting the federal role to anticipate and help overcome the unique challenges of such projects. At the heart of these challenges are innovative financing tools that appropriately reflect the interest of transportation companies, different levels of government, communities that benefit, and communities that suffer adverse effects.

Redrafting the federal role to meet the needs of improved intermodal transportation entails several complex dimensions. The role might be adapted to increase the priority for this sort of work, to increase financial-underwriting capacity, to boost coordination among affected interests, or to provide guidelines or technical assistance in dealing with special features like user fees or amelioration of community impacts. There will continue to be a gap between policy pronouncements and program accomplishment until the federal role is refined to address the exceptionally complex demands of intermodal projects.

Policy research could be useful in:

- Assessing the feasibility of establishing a separate quasi-governmental corporation (like Fannie Mae, Freddie Mac, or Sallie Mae) that has the resources and mission to engage in innovative finance capabilities like a private-sector organization.
- Reviewing experimental uses of innovative financing to extract guidelines that help assure that expanded federal participation of this sort will promote overall efficiency and not create problems in assuring the equitable distribution of support.
- Developing guidelines for determining whether public investments in specific bottlenecks or corridors will lead to distortion of competition. This is particularly an issue for intermodal projects. For example, improving access to one airport hub may affect the profitability of airlines serving competing hubs. Similarly, improving access to one port places that port – and the railroads and trucking lines serving it -- at a competitive advantage relative to others. The risk that public investments will distort competition can be reduced if appropriate shares of the cost are borne by the businesses directly affected, either through user fees or some other device. Guidelines that anticipate this potential problem could facilitate consideration of a fuller range of intermodal projects.
- Developing a set of model agreements that can be used as starting points in projects where states anticipate dealing individually with large numbers in individual public and private players.

- Developing more attractive approaches to determining the risk of federal subordinate loans. Reviewing experimental uses of innovative financing to extract guidelines that help assure that expanded federal participation of this sort will promote overall efficiency and not create problems in assuring the equitable distribution of support. This research would include investigation of a broader range of federal guarantees and indirect financial support capitalizing on a wider range of revenue sources
- Considering options that can simplify dealing individually with large numbers of individual public and private players and establishment of institutional mechanisms to facilitate repayment of private and government loans (state and federal) and repayment mechanisms
- Developing more attractive approaches and methods to determining the risk of federal subordinate loans to minimize the cost-burdens of borrowers as well as risk-related costs as assessed within Congressional and Executive Branch budgetary procedures.

3. Evolution of new, adaptive institutions. When its primary focus was to create a basic network, the federal-state partnership provided an appropriate framework for the similar challenges faced by each state. More recently, the focus of highway service improvements (passenger and freight) has increasingly focused on improvements that involve multiple jurisdictions or modes. The “Systems” being addressed do not end at local or state boundaries; improvements in areas like operations cannot function if they are constrained by such boundaries. Even the “boundaries” between public and private sector must be bridged in many instances. The need for an inter-jurisdictional focus occurs at several scales:

- Metropolitan highway and transit operations logically extend beyond the borders of local governments and other constituted authorities.
- Interregional corridors as the focus for major operations coordination may occur at the multi-state level
- Multimodal improvements may involve a combination of state and local governments, private corporations, and regional bodies

In such cases ad hoc arrangements are often established to bridge the needs of multiple jurisdictions and provide a broader focus. These arrangements often depend on informal and temporary relationships and tend to be awkward and ineffectual. Political leaders in the component jurisdictions may have divergent goals and priorities, and the established transportation agencies serving those jurisdictions may be reluctant to delegate their powers and resources. While occasional corridor associations or other multi-jurisdictional organizations have successfully found sufficient common purpose to overcome such differences, others never get off the ground. They may get bogged down if any of the component jurisdictions are reluctant to cooperate, if the jurisdictions cannot agree on how to delineate their responsibilities and those of agencies already established, or are unable to gain sufficient legal and financial stature to be eligible to receive federal financial assistance.

Recognizing that there are situations where the intrinsic scope of transportation problems does not match the boundaries of the agencies trying to address it, the federal Government might help fill the gap by encouraging the creation of special, multi-jurisdictional organizations that are better aligned to the needs. Such encouragement might be provided with different degrees of assertiveness, ranging from federal technical assistance, providing financial assistance to help support the operations of such multi-jurisdictional organizations, or making certain planning or construction funding available only to organizations of this sort. Similar forms of encouragement have been offered to stimulate the creation of Metropolitan Planning Organizations and a few multi-state entities such as regional planning entities and corridor coalitions.

Federal steps to formalize new non-state organizations are highly controversial. They may require substantial rebalancing of established roles, and federal persuasion here can be awkward as such institution building is interpreted by some as federal meddling in state or local matters. However, MPOs in place are the creatures of the federal aid program and federal transportation objectives. As this program evolves so too, should MPOs to take up or foster the taking up of new responsibilities. Furthermore it is clear that in many metropolitan areas, a significant proportion of travel is inter-jurisdictional and some of the resources for both capital development and operations are federal. On major routes at least, the failure of adjacent agencies to improve coordination is an impediment to interstate commerce environmental compliance and general welfare. There is a direct federal interest in seeing that the reach of institution is consistent with the national needs that they will be called upon to serve.

Policy research could be useful in:

- Reviewing the experience of ad hoc sub-national or sub-state coalitions to extract best practices and to set out organizational templates for possible application in other regions.
- Preparing a planning guide that describes how existing forms of federal support can be used to conduct activities that can build inter-jurisdictional cooperation.
- Examining the legal considerations and constraints to sub-federal entities such as metropolitan scale operating entities for highways (like transit authorities), multi-state operating entities (like the existing corridor coalitions), toll authorities, and multi-state ports and airports.
- Reviewing the current experience of ad hoc coalitions at the multi-state, sub-state and cross-sectoral level with regard to the issues that generated their formation, their objectives, operations, institutional structure and apparent effectiveness. Are such entities a growing need?
- Considering the types of federal support that might be supplied and their relative importance to such new entities. Most of them focus on systems operations and therefore have planning and operations resource needs. However, the work they do raises issues of capital investment by their various members
- Examining the legal and political considerations and constraints to new institutions. These will vary by level of government. Multi-state coalitions raise issues of federal-state jurisdiction; new metropolitan or extra-metropolitan

coalitions encounter both federal and state law regarding contractual relationships, and use of federal as well as state funds and possible overlaps with MPOs and other state authorities. Are there useful lessons from other authorities with operating powers and federal aid such as metropolitan transit authorities?

4. Reconciling competing mobility and environmental objectives. Historically, transportation policy has been driven by developmental, political, economic, defense, and social goals that go well beyond mobility itself. But for the most part, these goals have been reinforcing ones that complement the transportation objectives themselves: opening the west, unifying the nation, getting the farmer out of the mud, or allowing rapid defense mobilization all went hand-in-hand with improving transportation. The adverse side effects of transportation were considered of secondary importance through many previous eras, but recent decades have focused on such “negative externalities”. As social and environmental values have become more fully articulated, there have been some major clashes between some transportation programs and environmental and community objectives. A number of federal statutes have been enacted to serve each of the public concerns involved. These are set out in separate legislative frameworks, sometimes in brief provisions that have profound if vague implications.

As legislation is translated into administrative practice, simple laws can lead to complicated practice. The National Environmental Policy Act (NEPA) is only a few lines long, leaving much room for interpretation. As that interpretation is made through administrative rule making and judicial case history, these have grown to fill volumes. By and large the resulting regulations do not set out specific physical or design considerations that must be met, but instead require that certain kinds of information be gathered and considered. Where key details are not spelled out in legislation they end up being defined through court decisions. Over and above the NEPA itself, U. S. environmental laws are not set out in one clear and consistent body: they are attached throughout the U.S. Code to many kinds of legislation and rules. In addition, there is no clear lead environmental agency. Many separate institutions are involved, and agency approvals have been drawn out and complex – even for small projects with no significant impacts. Furthermore, constituencies who do not like the resulting decisions for whatever reason can use the environmental statutes to their own special advantage.

Transportation and environmental aims have separately been the subject of much legislative, administrative, and judicial attention during the past two decades, but project decisions have grown ever more complicated, slow, expensive, and frustrating. Large, multi-billion dollar projects are likely to involve environmental complexities and any reasonable process for addressing these will probably be time-consuming. However, much of the current frustration appears to stem not from large, inherently controversial projects but from smaller, more routine projects. Even when state and local governments are able and willing to take responsibility for these, it is claimed that federal statutes have given birth to bureaucracies and processes that misuse the established protections for unintended purposes. Decisions take too long. The human capital expended on the process is being wasted. A sense of proportionality needs to be restored to the process

Under today’s regulations, everything turns on process. More and more rules have been added to a slate that is already crowded and confused. The result has not been to articulate real milestones but to require numerous steps with respect to analysis, public involvement, or coordination. Critics argue that it is time to wipe that slate clean and replace all these procedural requirements with an outcome-oriented approach. They argue that the problem should be defined at an early stage, and everything that follows should be weighed with respect to its contribution to resolving that problem. Many projects could be dealt with fairly and expeditiously under such an approach, particularly routine local matters that do not appear to warrant federal involvement. For many projects State Departments of Transportation and State Resource Agencies are able to work out resolution of many issues independently, and should do so. Federal assistance in such cases can be counterproductive, and in any case it should be focused exclusively on large complex projects where it is more likely to be valuable in assisting resolution. Towards this end, last years Executive Order on Streamlining ordered USDOT to take the lead in improved cooperation among federal agencies and designate national interest projects for expedited reviews. Other highway groups have suggested that the federal interest should distinguish between major and minor environmental problems and that more routing activities should be delegated to states.

Policy research could be useful in:

- Using case histories to document the timeliness of current processes and to gauge the extent to which they are effective or “misused” by some objective measure.
- Reviewing the applicability of various modes of conflict resolution used in other sectors such as lead-agency approaches, negotiated rule-making, and other approaches.
- Considering regulatory modifications and screening criteria that would devolve minor impact projects for resolution at the state level
- Examining cases to determine whether environmental approvals can be usefully distinguished by project type into categories for differing administrative treatment in light of environmental issue, timeline experience, level of controversy, and the extent to which they are “misused” by some objective measure.
- Considering regulatory modifications that would devolve minor impact projects for resolution at the state level.

5. Inability to make quantum leaps in improved safety The federal-aid highway program stresses safety as a top priority. Three separate agencies focus on different aspects of highway safety: the Federal Highway Administration on infrastructure, the National Highway Traffic Safety Administration on driver behavior and vehicles and Federal Motor Carrier Safety Administration on trucks and other commercial vehicles. The fatality rate per mile traveled has gradually decreased for decades due to continuous, incremental improvements in vehicles, road features, driver preparedness, emergency services, medical advances, and other gains. The federal role here has taken on many forms, including financial assistance for dangerous facilities such as railroad-grade crossings or sub-standard bridges, improvement of geometric and safety features of all

federal-aid routes, encouragement to the states to adopt safety legislation such as safety-belt laws or speed limits, federal motor-vehicle safety standards in many areas, and federal encouragement of state laws to restrict the legal drinking age and to set tough limits on the blood-alcohol levels used in determining drunk driving

Yet despite the many steps taken by the Federal Government and thousands of other interests working to improve highway safety, the number of U.S. highway deaths nonetheless has been above 40,000 per year for every year except one in the past four decades. Highway crashes are the leading cause of death among young persons, representing the equivalent to a major passenger jet crash every day.

The public accepts this phenomenal toll of deaths and injuries on U.S. highways as an unremarkable necessity. They appear supportive of the numerous programs that have been created to improve the safety of vehicles, roadways, drivers, and emergency responsiveness. Indeed, the various initiatives to improve highway safety have resulted in continued progress in reducing the **rate** of highway fatalities per mile traveled. Public attitudes may reflect a widespread assumption that no reasonable stone has been left unturned in the area of highway safety.

Achieving a new plateau in highway safety appears to require something beyond the barrage of past and ongoing initiatives. One possible motivation for this might be our comparatively poor showing in highway safety: the United States no longer has the safest roads in the world. Several countries have aggressive policies, including zero tolerance, and they have overtaken the safety performance of the United States. No single agency or government official has the primary responsibility for anti-crash programs across-the-board. Several agencies have pieces of the problem. Private concerns – motorists, vehicle manufacturers, insurers, and businesses – are integral to change.

There is clearly the need for a new institutional framework – one that responds to both the public-public dimension (federal, state and local) and also the public private dimension. As a nationwide problem it cuts across many different areas and State and local governments. We cannot rely on State and local institutions to organize themselves to address the problem in a comprehensive fashion. While the same arguments hold for the federal government, federal agencies can operate at a scale large enough to address the problem, or at least that part of the problem that depends on financial resources. On the other hand certain aspects such as the court systems are necessarily local. On the public private side, the medical and insurance dimensions indicate the potential for a more synergistic form of partnering. The cultural dimensions of the behaviors that lie behind much of the fatalities dimension (alcohol, belt and helmet use, speeding, etc.) are deeply embedded in other social behaviors and values. They will take a long period to change – but they are not immutable

What would it take to establish a new threshold of progress in highway safety improvements? Is there a need for more aggressive leadership and tougher federal

regulation? Would consolidation of programs be effective? Will more spending on safety research be productive? Or, will reaching a new threshold require more fundamental changes that policy can help to cultivate? Might social marketing engender public determination to make quantum improvements? Do key private interests that now work separately need to cooperate in new ways?

Policy research could be useful in:

- Making systematic comparisons of US safety experience with that of European nations with good highway safety records. By scaling European gains to the US context and by making reasonable assumptions about the transferability of different patterns it might be possible estimates of the possible payoffs of different improvements as a first step in weighing their desirability in the United States.
- Assessing the potential of social marketing. As many of the contributing factors to highway crashes are behavioral, perhaps the problem should be considered a matter of public health – with a stronger emphasis on culture and plain English discussion of impacts and “correct” behavior. The potential of and specific activities to examine within such a drive might be assessed by looking at the success of past awareness-building programs in other areas, such as the anti-smoking campaign. A key part of such a program may be transportation professionals themselves. Little of the standard academic preparation received by transportation professionals focuses exclusively on safety.
- Exploring the feasibility of broader, over-arching programs. Separate programs to improve the safety of specialized facets of highway transportation may fall short of addressing features that cut across the conventional boundaries that are associated with vehicles, roads, enforcement, license administration, insurance, and other system components. Experience in other nations and fields suggests that working alliances between diverse organizational partners can be key in moving to new plateaus of performance. Research could examine instances where this has worked and develop an organizational model for consideration by leaders in highway-safety-related industries and organizations.
- Beefing up factual understanding of driver distraction. Research on driver distraction might be useful in properly managing current and future sources of distraction. While it is difficult to conduct large-scale social experiments on topics like this, the states themselves form a natural laboratory as different states apply different strategies for controlling cell phones and other distractions.
- Accelerating adoption of new technology. In-vehicle crash avoidance technology is within technological reach, but the speed with which such technology ends up in use depends on private-industry judgments about marketability. Can the timetable for this be accelerated? The answer depends not only on Detroit, but also on federal and state governments, the legal system, and insurance interests.
- Strategically reviewing the experience of other countries with respect to highway safety. The United States may profit from experience in other nations that have been able to lower fatality rates or accident rates in general, or that have been successful in reducing specific types of accidents, changing driver behavior,

reducing accident severity, or otherwise contribute to highway safety in ways outside direct U.S. experience.

6. Incentives for improved performance. As demands for transportation investment increase and public resources remain constrained and as the focus on customer service increases, “performance” becomes increasingly relevant. In recent years there has been increased focus within the highway community on performance in two ways:

- Performance can be viewed in terms of how efficiently an agency applies the resources that it spends. This orientation is especially relevant to an environment in which systems improvements and preservation – rather than basic network development are the principal focus on federal aid. The recent asset-management process development reflects this orientation. In this context the inherited “needs-based” distribution formulas may be less relevant as they do not reflect how effectively the funds are being spent.
- Performance can be gauged as “outcomes”. Here the interest is in efficacy rather than efficiency. The relevance of this perspective is reinforced where systems operational performance is concerned, i.e., are investments producing a measurable improvement in terms relevant to customer benefits.

There have been efforts to measure the relative effectiveness of different agencies by comparing asset quality vs. dollars expended. These suggest that the effectiveness of federal assistance might be greatest if it were channeled where it was doing the most to improve system performance measured by efficiency of outputs or qualities of outcomes. The ability to put this principle into effect is limited, however, by both technical complexities and the fact that programs serve multiple objectives. Any distribution scheme that allocates funds in a way that rewards performance must account for the diversity of conditions (population, geography, weather etc) over which the recipient has no control. Thus, any performance measure that makes comparisons across the full range of conditions must somehow compensate for them. While each state invests some of its own funds in surface transportation, there is not unequivocal basis for saying which states are doing “more” in view of the host of complicating factors. Nor is there a solid basis for comparing how effectively each is spending its surface transportation funds overall.

Further, the performance of the transportation system hinges not only on state investments and policies, but on those of other levels of government as well. In the San Francisco region alone, some 20 different organizations have transportation operations responsibilities. The sales tax used to support transit there is parceled out among those jurisdictions – at present some of it going to highways. Many local, metropolitan, and regional groups affect the performance of transportation in this region.

Given the diversity of local conditions and objectives there is a natural resistance on the part of recipients to have their programs judged by some central yardstick that may not match their circumstances or aims. However, even if such comparisons are not utilized for resource allocation, it may still be helpful to encourage practices within each state so that the federal assistance provided to the state is used to preserve or improve the

performance of the system to the maximum extent. Proponents of such encouragement argue that it could improve the effectiveness of federal assistance. Opponents argue its efficacy given the complications listed above, and they also argue that this would represent intrusive federal micromanagement of the states.

Accountability is an issue for agencies at all levels, and many states and localities are in fact measuring their own performance for their own purposes. Many state and local government are providing performance information to constituents relating to outputs per dollar invested, and a few are also reporting on outcomes. While most of this focus is on system physical outputs and qualities, there are some initial efforts focused on customer-related service outcomes as well. In seeking ways to boost performance measurement nationwide, perhaps the natural path is to build on the practices that have already been adopted by the states.

Policy research could be useful in:

- Identifying relevant appropriate performance measures by which agencies can gauge their own efficiency either against some agreed-upon targets or against their own performance measurement over time in terms of continuous improvement. Measures may be those that maximally remove the impact of unique context factors.
- Reviewing the use of benchmarks, performance standards and warrants in related sectors to determine their applicability in highway transportation. There are widely accepted standards in several areas relating to physical performance of assets. Perhaps similar approaches can be extended to operational performance.
- Identifying relevant performance measures with minimum dependency on context-specific influences.
- Examining the data requirements associated with performance measurement. Whatever conceptual advantages may be promised by improved performance measurement, the ability to realize them may be severely hampered by data limitations. As a practical matter, the benefits of applying performance incentives ultimately rest on making substantial improvements in the underlying data.
- Developing possible forms of recipient reporting that provide meaningful performance information recognizing local conditions and recipient objectives.
- Reviewing the use of benchmarks, performance standards and warrants in related sectors.

7. Economic importance of freight. In the later half of the 20th Century, highway freight transportation became increasingly important as patterns of production and distribution were more geographically dispersed and deregulation increased trucking service. More recently, increased global competitiveness has introduced just-in-time production and logistics firms that specialize in supporting it. These advances have increased the importance of highway performance for freight. In the next two decades, the nation's output is expected to increase by 70 percent, freight traffic by 40 percent, and container traffic by more than 100 percent. With truck traffic closely tracking the overall

increase in output, increasing freight flows threaten to overwhelm the available systems capacity, especially at key hubs, and to disrupt local communities.

Freight traffic has several attributes that distinguish it from passenger traffic:

- Freight typically moves long distances, often through several states. Facilities to improve freight flows may impose environmental or developmental stresses in communities that enjoy little direct benefit from the traffic.
- Many motorists see heavy trucks or railroads as obstructions, community noise problems, or safety threats. The nation's economic dependence upon freight vehicles for virtually everything we produce and buy probably pales as a distant abstraction compared to day-to-day experiences with the annoyance of trucks.

State departments of transportation and metropolitan planning organizations have not yet fully come to terms with the implications of current and projected growth in freight traffic in either planning or policy. Some have enacted new processes to get all the modes involved, but this is far from happening nationally. Private-sector shippers and carriers work within planning horizons that do not mesh well with the long-term perspective of public planning. While projects such as public-private terminal development cooperation and exclusive toll-supported truck lanes have been discussed, institutionalized financial cooperation is rare because the working environments and constraints of the parties are not easy to reconcile.

Unless the federal government steps forward and outlines the national importance of freight issues, the diverse interests of each private participant will discourage even high level consensus on problem definition and possible cooperative action. In the highly decentralized freight transportation industry, federal leadership is key to getting issues on the table so that the potentially interested parties can gauge their stake in freight matters and help improve the system. In this regard, nothing gets business attention like money. Providing some resources at the scale of demonstration projects – not earmarked funds but funding available to support creative new coalitions to address freight needs – could be a valuable next step toward a fuller national capacity to address these needs. Indeed, the creation of a new organizational unit to deal with freight transportation issues in the recent reorganization of FHWA promises to offer an important boost to the visibility of freight matters and to insure that they get worked into other FHWA activities. This will be helpful in broadening the FHWA's own focus and as a catalyst in getting state and local agencies to focus systematically on freight issues.

Policy research could be useful in:

- Encouraging more freight partnerships by providing detailed guidance on how to integrate freight into planning including explicit examination of freight benefits in project evaluation.
- Providing training programs that help bridge the gap between private-sector and public-sector needs to build increased mutual understanding.

- Identification of public-private partnerships approaches that permits indirect federal financial support of merit projects without inequitable subsidies to competing private entities.
- Evaluating the economics of exclusive freight facilities and the degree to which they can be self-financed
- Developing of approaches to identify the freight benefits of improved operations that may or may not diverge from general systems operations and management benefits.

8. Future role of national network. The Interstate Highway System was designed in the post WW II period for a developing national industrial, pre-truck, pre metropolitan economy. As the major connected network, it serves important interregional and metropolitan functions. While representing only a little more than one percent of the nation’s highway mileage, it carries nearly a quarter of all the nation’s highway traffic. It has the higher average speeds than any other road system in the country, but nonetheless has the best safety record of any class of U. S. roads. The Interstate Highway System has produced major economic, safety, and convenience benefits.

In recent years the benefits of the Interstate Highway System have been eroded by growth – growth in traffic on the system and growth in economic activities across the country. As a result of these trends, the traffic on Interstate routes is increasingly congested, reducing the convenience and economic benefits of the system. At the same time, shifts in regional development, modern intermodal logistics with attendant truck traffic, north American trade, growth in metropolitan commutation and recreational travel and have introduced new patterns of demand. In addition, more communities and activity centers are locating in locations without good proximity or connections to Interstate routes or other key transportation links. These changes raise the issue of the merits and issues associated with a systematic approach to further development of augmented priority high-level expressway systems.

Any consideration of systematic expansion or additions faces significant constraints. In the half century since the Interstate Highway System began, continued development has made it ever more difficult to acquire large amounts of right of way and heightened public sensitivity to environmental priorities has increased resistance to, and costs of, highway expansion in general and Interstate-type routes in particular. Projects of this sort require substantial economic and environmental justification.

The National Highway System in 1991 introduced a vehicle for working toward a workable consensus on this family of needs. The concept of the National Highway System recognized the limitations of the Interstate Highway System – the fact that its extent, connectivity, and performance were not keeping pace with growth. It initiated a process by which the states would designate a larger system of core routes. It did not characterize these routes as meeting some high-level, Interstate-type standard. These steps appear quite guarded compared to the introduction of the Interstate, which included a specific set of designated routes and design standards that applied to the entire system.

This cautious beginning was intended to give the concept ample room to develop and evolve to meet the various public expectations surrounding it. In fact, a few states have developed plans for major statewide network expansions and there are a series of priority national multistate corridors, often related to trade-based border crossings. However, these activities have not approached a significant level of national network augmentation. The National Highway System has never become more than a category for distribution of federal financial support; the fundamental questions that were left unanswered at its start remain unresolved today. The issues of national economic stakes in such a dramatic improvement have been submerged in the complex concerns of local disruption and financial feasibility.

There appears to be a broad consensus that economic development, population growth, increased globalization of trade, and shifting trade patterns within North America and within the United States create traffic needs that are not being well served by current interregional networks. Such problems will intensify as these underlying forces continue. Resolving these transportation needs involves addressing other areas of public concern as well, and there is little reason to believe that policy in this difficult area will move quickly. There is less reason to believe it will go away. A key challenge is to provide the basis for serious policy consideration.

How might the federal role evolve in response to this set of issues? The highly proscriptive model of the Interstate Highway System seems out of step with today's situation. Any steps taken by the U. S. Department of Transportation and the FHWA in particular could be viewed with suspicion as too narrow or self-serving. Conversely the discretionary "wait-and-see model" of the National Highway System appears to be losing ground as a vehicle for national convergence. Network effects and economies of scale are best perceived from a national interest perspective. It is not clear whether the state disinterest is based on competing values or simply a matter of economics. A key issue from the federal perspective is what it would take to attract state support and cooperation? Would a return to the 90/10 federal assistance for a high standard priority system . For example, the Interstate program offered extremely attractive 90/10 federal assistance for a core system of national routes built to certain high standards. Could favorable matching ratios, together with high performance criteria, prompt consideration of network enhancements of real national value that are politically appealing to state and local leaders? Might this issue be best framed in conjunction with the need for a more accommodating truck network? Or with major intermodal connections? Is there a NAFTA consideration regarding intercontinental trade? To what degree are major network considerations tied up with the questions of user finance and the use of tolls

While there is no clear sense of how the nation will resolve the concerns that center on its increasingly inadequate transportation networks, research on several features of possible federal roles may prove useful as events unfold in the years ahead.

Policy research could be useful in:

- Determine the opportunity costs associated with the circuitry required by the current network on major freight and passenger movement patterns
- Review the ongoing experience with other national network in Europe and Asia that are being developed (using tolls)
- Developing measures of network importance and measures for estimating differences in performance that can be considered as possible thresholds in qualifying key network-extension projects for federal assistance.
- Interviewing leaders who shaped state strategies in identifying routes to include on the system to identify the full range of considerations that went into these designations. The results could be organized and used as the basis of a multi-perspective workshop to explore whether they suggest criteria that could be used to rank routes in terms of their value to the network.
- Reviewing the federal-interest provisions that might be incorporated in public-private partnerships from the private perspective. Are there better ways of protecting the public interest without imposing onerous “strings attached” on private partners?
- Conducting credible “paper studies” of the potential macroeconomic value of substantial network improvements.
- Review strategies for the development of a focus national dialogue on substantive issues, maximally insulated from short-term constituency considerations and involving key stakeholders from both within and outside the conventional constituencies

Summary

The discussions reported here focused on a few illustrative issues, but they suggest several general themes that may alter the future direction of federal surface-transportation policy. These themes reflect pressures that are becoming evident within current surface-transportation programs as well as developments in the economic and social context that those programs serve. It is helpful to identify these forces as they begin to emerge. By exploring their implications for possible future changes, the Federal Highway Administration can assess ways that the federal government can best use its resources to meet future challenges.

The existing set of programs and governmental roles in surface transportation are not always well matched to future demands. They have evolved over the decades to serve a wide range of transportation needs and other public objectives. Further evolution is necessary and appropriate. Forum discussions identified eight key themes that could prove to be shaping the future evolution. These themes suggest areas where programs do appear to fall short of emerging needs, lie outside the scope of current jurisdictions, are unable to alleviate safety or environmental concerns, or may shift in response to resource limitations, technological potential, or new public expectations. These eight themes are:

- Many states and localities increasingly face large, complex, one-of-a-kind projects that do not fit neatly within the established categories of federal-aid assistance. These are often too expensive to complete using only the amounts distributed by formula within these categories. By their nature, they require concentrated funding in a few places. To expedite this sort of work, the federal government may respond by acting more like a specialized investment banker than a provider of conventional savings-and-loan products.
- Surface-transportation projects whose benefits are concentrated on a few identifiable regions or businesses are becoming more common, particularly in the case intermodal improvements. Such projects can be essential for improving the effectiveness of the nation's multi-modal capability, but as they benefit specific companies they may pose a competitive disadvantage to others. Public assistance to such projects must be structured in ways that are equitable and that do not distort competition between regions, modes, or carriers.
- With the completion of the Interstate Highway System, federal attention has shifted from construction of a systematic national network. In the wake of centralized planning of additional capacity, more multi-state regions find themselves facing needs that are bigger than one state can address yet outside the reach of established federal-assistance programs. These may show up as proposals to finance specific key corridors, to develop Intelligent Transportation Systems, or to take on major intermodal projects. New organizations may be required to reach beyond established jurisdictional boundaries to deal with such needs.
- Public concerns about environmental quality have become a key driver of transportation decisions. These concerns have led to important legislative statutes that apply to transportation projects, and to complex case law and procedural requirements enacted to enforce the statutes. The regulatory process that has emerged is cumbersome and inefficient, very procedurally oriented, and insufficiently able to distinguish routine situations from those where special handling is required.
- More than 40,000 lives a year are lost on U.S. highways in spite of the high priority that has been given to this concern by the Congress and numerous agencies. The U.S. has been slipping in highway-safety performance relative to several other nations. Safety improvements in other countries stem in part from aggressive approaches they have adopted; some of these may have promise here.
- Performance is receiving increased stress in surface-transportation programs and government activities generally. Conventional surface transportation assistance programs were designed in an era when widespread development needs were the underlying motivation. Needs-based allocation was an effective way to meet the states' common needs fairly. As the nation moves from a developmental era to a

more mature phase, federal assistance may increasingly be targeted in ways to enhance program efficiency and effectiveness.

- Freight is moving to the center of surface-transportation policy. The importance of freight has been highlighted by the surge in global trade and by advances in logistics and just-in-time production. Global trade is expected to continue to advance, and this will increasingly reshape the surface transportation needed to support it.
- The nation’s core surface-transportation network – the Interstate Systems – reflects planning from half a century back. While economic and residential growth have been concentrated around this system, much growth has occurred in regions where this could not have been anticipated decades ago. Consideration needs to be given to network adequacy in regions where existing highway networks are not serving demands for interregional transportation efficiently or effectively.

All in all, the sense of the forum was that current programs and organizations serve vital functions, but the gaps that they leave are increasingly gaining in importance, and a variety of tailor-made organizations, financing arrangements, and programs are needed to cope with these diverse gaps. The federal government can increase its ability to respond by anticipating future challenges, weighing possible ways to handle them, and strategically building the information and expertise required for sustained federal leadership. As a first step, the forum discussions sketched possible research directions, listed under each theme in section III, that could enhance federal capacity to deal with each of the eight themes identified.

This forum identified key features where federal financial aid, encouragement of innovation, institutional development, or technological assistance will face special challenges. The continued vitality of federal leadership in surface transportation hinges on how policies change to address such challenges. Increasingly, federal policy in this area affects not only state transportation agencies, which have been and continue to be key partners in surface-transportation policy. Meeting future challenges will require agility in working with multi-state regional bodies; with rail, maritime, aviation, and transit operators; with environmental and safety agencies; and others involved in transportation operations. This will reinforce the need for enlightened federal leadership in steering financial and technical support so that they address emerging needs. The core mission of surface transportation agencies will continue. “Special cases” will grow in importance and program share. Mobility and competing social objectives will increasingly be resolved at the project level rather than the program level. In short, transportation projects will increasingly be crafted to meet competing public objectives, adapt to varied geographic scales, and balance public and private financial interests.

As tailored, one-of-a-kind solutions become the norm, standardized design or accounting practices become less important but federal technical and procedural leadership become

vitally important. The federal role will continue to evolve from that of a financial partner in a steady and predictable business to a financial and institutional broker poised to expedite the dynamic and volatile aspects of the business.

APPENDIX A:

FACTORS CONSIDERED AND DETAILS OF THE FOUR SELECTED ISSUES

The forum whose results are reported here focused on the four specific issues set out in section II, Table 2. These were selected as being particularly useful illustrative issues, based on consideration of a far broader range of possibilities.

The scope for this forum began with the drafting of 31 issues for possible consideration. These are listed in Table A.1. Stephan Lockwood wrote sketches for each of these issues. They illustrate the variety of developments that may prove to be instrumental in eliminating obsolete federal activities or in ushering in needed new programs. This list reflects the mainstream of transportation-policy discussions now underway, and it offers a tangible point of departure for agency managers to think ahead and ponder future challenges.

Table A.1: Full Range of Issues Considered for Discussion

1.	Inadequate interregional highway network, given changed economy/geography (adequacy of network, capacity, redundancy, standards for potential future role)
2.	Uneven NHS physical conditions (adequacy of funding, priority to maintain appropriate conditions)
3.	Lack of accommodation to NAFTA and transcontinental trade via establishing/improving continental trade corridors at higher standard for freight
4.	Existence of major urban network bottlenecks (a la Highway Users study of key national interchange projects)
5.	Low system reliability, connectivity, in light of increased importance of highway freight/supply chain logistics (JIT operations, intermodal access links)
6.	Absence of life cycle management of federal aid facilities (institutionalizing asset management)
7.	Poor large scale project cost control (federal project fiscal oversight)
8.	Project delays due to planning, environmental, project management and procurement inconsistencies, conflicts
9.	Highway Trust Fund real revenue reduction (impacts of inflation, evasion, diversion, fuel efficiency)
10.	Failure to adjust traditional tax funding approach to respond to alternative fuels and broader programs
11.	Inequitable highway-related taxation (cost reallocation)

12.	Modest management response to recurring and non-recurring congestions (lack of coordinated operations and management/ITS programs, new regional organizations)
13.	Absence of accountability for system conditions and performance (reporting, benchmarking,)
14.	Inconsistent support for national defense mobilization (fort to port systems)
15.	Modest reaction to domestic counterterrorism threats and highway role in emergency response
16.	Persistence rural crash problem (program focus on facility improvements)
17.	Persistent truck safety problems (FMSCA)
18.	Acceptance of high highway fatality rate (policy targets, program options)
19.	Modest level of safety-related enforcement & tracking (automated enforcement vs. privacy)
20.	Need to accommodate design implications of demographics (aging, immigration)
21.	Low level of innovation in transportation infrastructure related areas. (lack of incentives, resources, longer range views)
22.	Erosion of technical expertise in range of program specialties (location, public vs. private, level, availability)
23.	Modest public support of private telematics breakthrough technology – especially where cooperative approaches essential)
24.	Absence of research on effects of highway service improvements (social, economic)
25.	Lack of coordinated multimodal metropolitan systems (highway program support for transit, operations)
26.	Lack of coordinated multimodal service in congested and disruptable intercity corridors (Amtrak, HSR, etc)
27.	Inequity of service availability (justice of distribution of costs/benefits)
28.	Conflict among policies regarding transportation and economic development vs., air quality compliance, global warming (modification to conformity, standards)
29.	Low level of transportation and land-use coordination (sprawl)
30.	Lack of context sensitivity in highway development
31.	Threat of global warming related to carbon fuels

As suggested by the length of this list, there is a wide range of issues competing for attention and action. Many new issues arise from changes in transportation patterns, governmental financing, regional economic development, new technology, quality-of-life

values, and the like. Other observers might identify additional issues, but even 31 is an awkwardly large number to address systematically. To find a manageable starting point, a panel of experts reviewed the 31 issues and consolidated them into a shorter list of 15. To assist this exercise, each of the issues was described in greater detail, the evolution of the federal role relative to it was summarized, and possible options for future changes in the federal role were enumerated. The examples provided below in this Appendix show the descriptions for the four issues considered in-depth at the forum whose discussions are summarized in the body of this report.

ISSUE/OBJECTIVE	A. INADEQUATE CAPACITY, CONNECTIVITY FOR EFFICIENT LONG-DISTANCE (INTERREGIONAL/INTERNATIONAL) FREIGHT AND PASSENGER MOVEMENT (INTERSTATE COMMERCE)
FEDERAL INTEREST	Interstate Commerce (constitutional responsibility)
EMERGING ISSUES	<ul style="list-style-type: none"> ▪ Movement of interstate commerce in response to long-term developments in regional settlement patterns, contemporary logistics. International (NAFTA) and interstate freight routes. ▪ The current NHS does not provide sufficient capacity, directness, intermodal links or safety. ▪ Increased importance of freight transportation, especially intermodal, port-related, etc. ▪ Is there a long-term need for an augmented national interconnected network – a “system”? ▪ Is the Interstate to be the “final” national system? State level action faces local opposition without stronger federal support, identification of premium system, etc ▪ What is the long-term potential for alternative modes to meet some of the projected growth in passenger and freight transportation? Should changes in the federal role with respect to alternative modes be considered to help achieve this potential?
EVOLUTION OF ROLE AND CURRENT EFFECTIVENESS	<ul style="list-style-type: none"> • Intercity network original impetus • Federal leadership in establishing concept and map • Defense mobilization as proximate justification • Key features included: <ul style="list-style-type: none"> ➤ Cost-to-complete concept ➤ Preferential match ➤ Establishment of HTF and tax support ➤ Federal oversight of construction • Subsequent evolution: <ul style="list-style-type: none"> ➤ Completion of original network ➤ Establishment of NHS as “system of eligibility” (no standards, cost to complete?) ➤ Limited funding support for STRAHNET system/connectors

	<p>➤ Intermodal connectors identification</p> <p>With completion of IS and soft approach to NHS, there is no consensus on an improved national system and no clear direction towards improved interregional connectivity to support growth in “interstate” commerce.</p>
<p>FUTURE CHANGES IN ISSUE THAT IMPLY NEED FOR NEW FEDERAL ROLE</p>	<ul style="list-style-type: none"> • Major increases in traffic, especially truck traffic • Continuing changes in regional settlement patterns • Growth in global/continental commerce in which both scale and patterns (beyond IS) implies need for expanded national network (serving NAFTA trade corridors, etc) • Increased significance of truck freight, JIT Logistics, multimodal/intermodal links • Changes in balance, roles of freight modes • Increasing congestion on Interstate System will divert some traffic to lower-design highways that are less safe than Interstate highways
<p>CURRENT STATE/LOCAL PROGRAM DIRECTIONS AND IMPLICATIONS FOR NEW FEDERAL ROLE</p>	<ul style="list-style-type: none"> • Problems of state fiscal capacity • Difficulties facing state consensus on collectively supported identification of premium system • Limited support for categorically-constrained funding and “requirements” that limit use of funds (unfunded mandates); categorical programs eroded by transfer flexibility and reduced federal oversight; significant flexing of NHS funds • Equity issues limit state/local interest in NHS in many metro areas • Uneven interest in NAFTA and borders and corridors • Some interest in multipurpose interregional corridors (highway/rail/utilities) • Difficulty in implementing new capacity (community, environmental), but some limited regional interest in new corridors <p>Competing state priorities suggest difficulty in reaching consensus on major single “premium system improvements” to serve interstate commerce, especially if benefits accrue primarily to persons and businesses outside the State.. Given the high cost of such improvements, competing priorities of apparent greater parochial significance make it difficult to plan and program investments where the benefits are substantially collective (national).</p>
<p>FEDERAL ROLE OPTIONS</p> <ul style="list-style-type: none"> • Eligibility • Develop map and standards • Categorical funding • Transfer flexibility preconditions • Match rate • Set asides, minimums • Research 	<p>Minimal:</p> <ul style="list-style-type: none"> • Do nothing (maintain NHS as system of eligibility) <p>Modest (options):</p> <ul style="list-style-type: none"> • Modify match to attract state investment or limit transferability by conditions criteria (state initiatives) • Increased federal investment in NHS via category • Equip NHS with special information-based operations “infostructure” <p>Strong:</p>

<ul style="list-style-type: none"> • Standards • Regulations • Financial incentives based on performance 	<ul style="list-style-type: none"> • Identify and fund new premium network (NAFTA?) with standards, • Designation process, program funding • Involve private sector in pricing-based approach
<p>RESEARCH NEEDS</p>	<ul style="list-style-type: none"> • Potential logistics savings and distribution of benefits associated with premium network • Intermodal implications • Multipurpose potential • European toll road experience

ISSUE/OBJECTIVE	B. INEFFICIENT UTILIZATION OF EXISTING HIGHWAY CAPACITY IN RESPONSE TO CHANGING CONDITIONS OF SUPPLY AND DEMAND
FEDERAL INTEREST	Federal investment Stewardship
EMERGING ISSUES	<ul style="list-style-type: none"> • Low level of systems operations in face of +/- 50% capacity loss to incidents, construction, weather, signals, etc. – urban and rural • Increasing significance of systems reliability in “JIT” context for contemporary intermodal freight logistics and for efficient passenger transport • Unrealized opportunities to capitalize on new concepts and technology for improved systems operations and management (“take back the capacity”) • Increasing constraints on adding capacity to improve system performance • General interest in asset management • Institutional orientation/fragmentation undercuts potential program focus on customer-related “outcomes” as distinct from agency “outputs”
EVOLUTION OF ROLE AND CURRENT EFFECTIVENESS	<ul style="list-style-type: none"> • Historic federal role very limited in operations and maintenance which were and are funded substantially out of state and local funds • History of TMS, TDM and CMS suggests limited state interest in federal mandates re: systems operations and management • Systems operations and management became eligible uses of federal aid in NHS act and generally part of statewide and metro planning considerations • FHWA and AASHTO reorganizations to provide systems operations focus • “National Dialogue on Operations” as effort to generate stakeholder interest <p>Federal policy and influence on operations hampered by absence of lack of clear policy on operations and current program categorical focus. Federal role limited to support of on ITS infrastructure and cooperative planning without clear incentives for greater state/local focus on operations performance.</p>
FUTURE CHANGES IN ISSUE THAT IMPLY NEED FOR NEW/STRONGER FEDERAL ROLE	<ul style="list-style-type: none"> • Increases in recurring and non-recurring congestion • Increased challenges to major capacity increases as option • Increased importance of accountability for systems reliability to users • ITS technology offers significant opportunities to improve operations • Private sector investment in telematics, semi automation increases focus on service quality • Increased availability of real time systems status information from private sector

<p>CURRENT STATE/LOCAL PROGRAM DIRECTIONS AND IMPLICATIONS FOR NEW FEDERAL ROLE</p>	<ul style="list-style-type: none"> • Lack of state policy commitment and program/budget alignment to systems operations – but interest in asset management growing • Some increased state focus on systems operations and management in bellwether states, including reorganization • Parallel evolution in asset management <p>Lack of tradition of federal leadership in operations requires states to alter use of federal aid without federal support with traditional constituencies; no clear existing legislative mandates</p>
<p>FEDERAL ROLE OPTIONS</p> <ul style="list-style-type: none"> • Eligibility • Develop map and standards • Categorical funding • Transfer flexibility preconditions • Match rate • Set asides, minimums • Research • Standards • Regulations • Financial incentives based on performance 	<p>Minimal:</p> <ul style="list-style-type: none"> • Consciousness raising and technical assistance <p>Modest (options):</p> <ul style="list-style-type: none"> • Supply financial incentives for operations planning and performance management • Provide targeted funding for operations • Fund equipping of NHS with operations/safety “infostructure” <p>Strong:</p> <ul style="list-style-type: none"> • Establish performance standards (like design standards)
<p>RESEARCH NEEDS</p>	<ul style="list-style-type: none"> • Relationship among user needs impacted by operations and cost-effective strategies (a la F-SHRP) • Analysis of causes of delay and unreliability as related to potential remediation

ISSUE/OBJECTIVE	C. PERSISTENCE/ACCEPTANCE OF HIGH CRASH AND FATALITY LEVELS
FEDERAL INTEREST	Public safety, health and welfare (some dimensions “national” such as vehicles)
EMERGING ISSUES	<ul style="list-style-type: none"> • Policy acceptance of high fatality rate and high accident level despite potential opportunities of significant reductions available by a more aggressive and integrated approach • New technology available to address some safety problems (red-light running, speeding) but public resistance to use of those technologies • Freeway congestion diverting traffic to less-safe arterial highways • Examples of policies, progress in other countries • Relative role of public and private sectors, given potential of new technology.
EVOLUTION OF ROLE AND CURRENT EFFECTIVENESS	<ul style="list-style-type: none"> • FHWA traditional safety role focuses on design issues (geometrics) and roadway physical characteristics • Human factors research began in late fifties and sixties • Recognition of importance of enforcement issues (belts, DWI) but limited political appetite for regulation impacting auto industry • Public private cooperation in crash avoidance/worthiness research • Fragmentation of safety responsibility among FHWA, NHTSA, DMVs, FMCSA, State/local DOTs, GHSRs, law enforcement and public health communities • Congressional focus via incentives/disincentives <p>Lack of federal priority focus at federal level; modest policy commitment in face of competing issues; laissez faire regarding delegation</p>
FUTURE CHANGES IN ISSUE THAT IMPLY NEED FOR NEW/STRONGER FEDERAL ROLE	<ul style="list-style-type: none"> • Increasing intolerance of crash and fatality rates given potential of technology • Stronger congressional interest in performance • Increase in elderly drivers • Examples from zero tolerance policies of other countries • Pace of market-based implementation of crash avoidance, incident response products and services suggesting potential significant impacts of technology deployment • Potential and acceptance of automated enforcement (speed, BAC, etc.)

<p>CURRENT STATE/LOCAL PROGRAM DIRECTIONS AND IMPLICATIONS FOR NEW FEDERAL ROLE</p>	<ul style="list-style-type: none"> • States see safety research as collective or federal responsibility • Fragmentation at state level among enforcement, safety, DMV etc • Fragmentation at federal level • Modest federal support for IVI and public/private cooperative research • Federal/state efforts improve integrate traffic/medical records • Vehicle- oriented efforts seen as “federal” since industry is at national scale • Resistance to federal safety mandates that are perceived to infringe on personal liberties (seat belts, helmets, etc) <p>Tolerance of existing rates and ability to reduce with limited coordination; Aggressive federal role may be resisted by public and private sector as well. Lack of consensus needed on problem significance and belief that effort is worthwhile</p>
<p>FEDERAL ROLE OPTIONS</p> <ul style="list-style-type: none"> • Eligibility • Develop map and standards • Categorical funding • Transfer flexibility preconditions • Match rate • Set asides, minimums • Research • Standards • Regulations • Financial incentives based on performance 	<p>Minimal:</p> <ul style="list-style-type: none"> • Continued support for safety set-asides • Modest federal support of IVI programs <p>Modest (options):</p> <ul style="list-style-type: none"> • Increase in IVI program funding • Increase categorical funding for research and safety programs • Data development to support investment payoffs <p>Strong:</p> <ul style="list-style-type: none"> • Identify relative investment payoffs and concentrate on C/E strategies • Pursue comprehensive approach (coordination of several vehicle technology, infrastructure, behavior modification and enforcement programs) • Programs to engage public action • Target funds for high risk facilities • Develop safety performance standards • Federal level institutional reconfiguration
<p>RESEARCH NEEDS</p>	<ul style="list-style-type: none"> • Potential leverage of new technology • Relative payoffs of vehicle, driver, infrastructure-based approaches • Lessons learned from approaches of other countries

ISSUE/OBJECTIVE	D. PROGRAM DELAYS AND COSTS IMPOSED BY INCONSISTENT FEDERAL INTERDEPARTMENTAL POLICY AND ROLES Despite commitment to environmental quality, uncoordinated federal interdepartmental policies lead to substantial delays and costs in project development
FEDERAL INTEREST	Public safety health and welfare
EMERGING ISSUES	Program delays and costs imposed by inconsistent federal interdepartmental policy, roles, applications and oversight in air quality and 106 compliance, energy policy (CAFE) resulting in uncoordinated and burdensome federal agency regulatory permitting of highway projects (DOT, EPA, COE, etc)
EVOLUTION OF ROLE AND CURRENT EFFECTIVENESS	<ul style="list-style-type: none"> • Development and codification of NEPA requirements by DOT • Increased involvement of environmental agencies in environmental review • Acceptance in policy at state and federal level of general environmental stewardship responsibilities and significant progress in reduced direct impacts • Increase in ability and commitment of states to competently manage environmental compliance and some reduction in DOT regulation and oversight • Inability to achieve effective streamlining as per TEA-21 • Executive Order on environmental streamlining and current follow-up <p>Continued uncoordinated federal oversight and policy priority conflicts regarding transportation investment implications (external impacts) involving several federal agencies</p>
FUTURE CHANGES IN ISSUE THAT IMPLY NEED FOR NEW/STRONGER FEDERAL ROLE	<ul style="list-style-type: none"> • Shift if focus on environmental concerns – new mix re vehicle vs. infrastructure • Changes in relative importance on negative environmental contributions of highway programs compared to other contributors • Increasingly complex technical issues in politicized environment • Increasing burden and frustration at State level with project level requirements and development time frames • Potential of new management approaches (lead agency, schedules) to achieve greater permitting coordination
CURRENT STATE/LOCAL PROGRAM DIRECTIONS AND IMPLICATIONS FOR NEW FEDERAL ROLE	<ul style="list-style-type: none"> • Varies by state with complex interplay of national vs. federal issues and interests • Various experiments with state-driven streamlining approaches • Follow-up to EO on streamlining underway <p>Lack of alignment in federal program objectives; process management may require new structure</p>
FEDERAL ROLE OPTIONS	Minimal: <ul style="list-style-type: none"> • Continuing conflict and sub optimization among federal

<ul style="list-style-type: none"> • Eligibility • Develop map and standards • Categorical funding • Transfer flexibility preconditions • Match rate • Set asides, minimums • Research • Standards • Regulations • Financial incentives based on performance 	<p style="margin-left: 40px;">agencies</p> <p>Modest (options):</p> <ul style="list-style-type: none"> • Cabinet level mediation to streamline • Legislation to reconcile competing interests <p>Strong:</p> <ul style="list-style-type: none"> • Single federal policy
<p>RESEARCH NEEDS</p>	<p>Process options</p>

APPENDIX B: PARTICIPANTS AND OBSERVERS

The Federal Role in Surface Transportation Public Policy Forum

*December 11, 2002
Loews L'Enfant Plaza
Washington DC*

Forum Chairman:

Wachs, Martins
Resources for the Future

Report Co-authors:

Kulash, Damian
Eno Transportation Foundation

Lockwood, Stephen
Parsons Brinckerhoff

Forum Participants:

Campbell, Sarah
TransManagement, Inc.

Deen, Thomas
Consultant

Downey, Mortimer
PBConsult

Gehr, David
Parsons Brinckerhoff

Kathryn Harrington-Hughes
Eno Transportation Foundation

Kassoff, Hal
Parsons Brinckerhoff

Kirby, Ronald
Metropolitan Washington Council of
Governments

Participants, continued:

Lewis, David
HLB Decision Economics Inc.

McDowell, Bruce
National Academy of Public
Administration

Millar, William
American Public Transportation
Association

Norman, Mark
Transportation Research Board

Orski, Kenneth
Urban Mobility Corporation

Pisarski, Alan
Consultant

Poole, Robert
Reason Foundation

Ritter, Robert
Eno Transportation Foundation

Tischer, Mary Lynn
Virginia Department of Transportation

Young, James
Washington Letter on Transportation

Observers:

Ken Adler

Environmental Protection Agency

Susan Binder

Federal Highway Administration

Sue Anna Cellini

Federal Highway Administration

Patrick DeCorla-Souza

Federal Highway Administration

King Gee

Federal Highway Administration

Suhail Khan

Federal Highway Administration

Edward Kussy

Federal Highway Administration

James March

Federal Highway Administration

Ronald Marshall

Federal Highway Administration

Chip Nottingham

Federal Highway Administration

George Ostensen

Federal Highway Administration

Andrea Rogers

Federal Highway Administration

Rolf Schmitt

Federal Highway Administration

William Sears

Federal Transit Administration

David Walterscheid

Federal Highway Administration

Bob Yatzeck

Federal Aviation Administration

Yegor Yurkin

Federal Highway Administration

The Triumph of Pork over Purpose

By David Luberoff

For at least the past decade, it has become increasingly clear that there is no national purpose driving federal highway and transit funding programs. Instead, a variety of special interests -- from contractors and unions to environmentalists and urbanists -- have come to view the national highway and transit program as an opportunity waiting to be tapped. As Democrats begin to think about the reauthorization of federal highway and transit programs in 2003, it may, therefore, be time to take a page out of our history and give states and localities primary responsibility for both funding and building highways and transit systems.

For most of our history, in fact, highways and public transportation were a state and local matter. While the notion of a nationally planned and funded transportation system was first proposed by President Thomas Jefferson's Treasury secretary, Albert Gallatin, it was not until the Eisenhower years, when federal funding spurred the construction of the long-planned national interstate highway system, that the national government made transportation a top domestic priority.

By the late 1960s, however, it was clear that the interstate highway program was skewing investment decisions in urban areas because the federal government paid 90 percent of the cost of planned interstate highways. In accordance with the wishes expressed by big-city mayors and business leaders in the 1940s and 1950s, these roads were to extend into the heart of virtually every major city in the country.

In contrast, there was little federal aid for other highways and no aid for transit, which had been losing riders at a rapid rate since the end of World War II. Contending that the combination of generous federal aid for highways and no aid for transit distorted local spending decisions in favor of unacceptably disruptive roads, a coalition of big-city mayors, transit advocates, environmentalists, and anti-highway activists sought to increase funding for transit and give states and localities more flexibility in how to spend money allocated for interstate highways. Pro-highway forces initially resisted these efforts, but by the mid-1970s key highway advocates came to believe that unless they made peace with transit advocates, the entire highway program might collapse. Consequently, in the early 1970s highway advocates not only backed significant increases in federal funding for transit but also agreed to provisions allowing states to trade in money earmarked for highways to build rail transit instead. (This latter provision helped fund major transit expansion projects in dozens of localities including Boston, Washington, D.C., Chicago, and Portland, Oregon.)

This uneasy alliance has endured for over three decades, and it has proved to be extraordinarily powerful. Indeed, it is so powerful that federal funding for highways and transit generally has risen steadily even though the interstate highway system, which spurred the vastly increased federal role in highways (and indirectly led to the federal transit programs as well), has been virtually complete since the early 1980s.

Post-interstate policies. As the interstate highway program has wound down, federal highway and transit programs have slowly become transformed into a hodgepodge marked by three sometimes conflicting phenomena.

First, funding formulas have been slowly converging on a point where each state's share of available highway aid is about equal to the share of federal gas taxes raised in those states. This is an important shift from the initial interstate legislation, which (in contrast to most federal programs) generally subsidized the construction of interstate highways in Northeastern and Great

Plains states while generally shortchanging Mid-western and Southern ones. To date, however, transit legislation has yet to follow similar patterns, largely because most transit riders are concentrated in a handful of cities. Representatives of many Sunbelt states, however, have been pressing for greater "equity" in the distribution of transit funds -- a fight likely to intensify during the drafting of a new highway and transit act. The measure is generally known as TEA-3, in keeping with the names of its two predecessors, TEA-21 (the Transportation Equity Act for the 21st Century, which passed in 1998) and ISTEA (the Intermodal Surface Transportation and Efficiency Act, which passed in 1991).

Historically, Congress has met the demands for funding equity by increasing total spending -- a phenomenon strongly supported by those who build highways and transit systems as well as by state and local officials who prefer federal to local funding for projects because it allows them to claim credit for projects without having to justify their costs. TEA-21, for example, authorized spending far in excess of the amounts implied in the landmark balanced budget agreement signed by the Clinton administration and leaders of the Republican Congress in 1997. The law then directed most of the new money to the Sunbelt and Midwestern states that historically had sent more to Washington in gas taxes than they received in federal highway aid. (Not coincidentally, many of those states were represented by Republicans, including several in key leadership posts.)

Second, Congress generally has given states increased flexibility in deciding how to spend available funds. This trend was particularly noteworthy in ISTEA, which eliminated many categorical grant programs in favor of a program structure that now gives states great discretion in choosing how to divide funds between highways and transit and in deciding exactly which projects they will fund. (TEA-21 basically retained this structure.) The flexibility, however, still comes with extensive strings -- most notably complex and often confusing rules governing the transportation planning process as well as numerous restrictions on exactly how federal aid can be spent.

Third, the general push toward greater flexibility has been tempered by the fact that members of Congress also like to claim credit for specific projects and programs popular among key local constituencies. Consequently, since the late 1980s, members also have used authorizing and appropriations measures to earmark funding for an increasing number of projects. There were only a handful of such earmarks in the 1982 act reauthorizing highway and transit laws, but the 1987 measure contained funding for about 150 specific projects -one of the rationales President Reagan cited in his unsuccessful veto of that law. In contrast, no one blinked an eye when ISTEA earmarked money for more than 500 highway and transit projects or when TEA-21 included more than 1,800 earmarks.

In addition to earmarking for specific projects, ISTEA and TEA-21 also included a raft of new spending programs aimed to please a variety of constituencies. Most notably, both laws included a "transportation enhancements" program requiring states to spend a portion of their federal aid on cultural, aesthetic, and environmental projects such as the restoration of historic transportation facilities, bike and pedestrian facilities, landscaping and scenic beautification, and the mitigation of water pollution from highway runoff. While the question of whether such projects ought to be a national responsibility is debatable, politically such provisions expanded the traditional coalition in support of highway and transit laws to include a host of new constituencies, such as environmentalists, preservationists, and new urbanists.

Congressional earmarking and the creation of small, targeted programs, of course, are both longstanding traditions and ones that can serve a good purpose if they are used in the service of larger policy goals. Daniel Patrick Moynihan, for example, reportedly secured support for ISTEA's important programmatic changes by agreeing to back the law's many earmarked projects. (Moynihan was no fool, of course. He also made sure many of those projects -- most notably

money to convert the Farley Post Office building into a replacement for Pennsylvania Station -- were in New York state.)

But every careful student of legislatures also knows that money for earmarked projects and special programs is not distributed by need or merit but in accordance with seniority and power. And from Tip O'Neill's efforts to make Massachusetts' Central Artery/Tunnel (CA/T) project eligible for interstate funding to Bud Shuster's securing of funding for dozens of projects in Pennsylvania in TEA-21 (and the many measures that preceded TEA-21), highway and transit legislation has never been an exception to this rule.

More important, the prospect of significant federal funding drives states and localities to build projects that they never would undertake if they had to fund even a significant portion of the costs themselves. For example, the funding strategy for virtually every major rail transit project built in the last three decades -- from Los Angeles' Red Line to Seattle's current troubled project -- has been predicated on securing significant federal funding for those projects because local officials knew that local voters would never have approved local taxes needed to fully fund those projects. Similarly, the CA/T project's advocates candidly admit that they never would have started the project if they thought that Massachusetts would have to pay a large share of its total cost, which has risen from \$3 billion in the 1980s to more than \$14 billion today. (Indeed, the state now has to pay about 40 percent of the project's costs, largely because Massachusetts, which under ISTEA had been receiving almost \$3 in highway aid for every dollar it sent to Washington in gas taxes, was the only state to receive less federal highway aid in TEA-21 than it got in ISTEA.)

Taken together, the press for special projects and programs creates a process that is politically compelling but one that also is far from economically efficient. And that means we either are spending too much on highways and transit or, more likely, that we're not spending the money we have in ways likely to produce significant positive payoffs by either making the economy more efficient or improving the quality of many people's lives.

Returning to first principles. One way to fix the current system would be to seek a national vision akin to the interstate highway program. Some Amtrak advocates have been trying to make the case for high-speed rail lines, but most careful analyses strongly suggest that such lines would attract relatively few riders at extremely high costs. The history of the interstate program suggests, moreover, that over time infrastructure programs marked by a strong national vision will have two important unintended consequences. First, national programs generally aren't flexible enough to respond to local circumstances -- as evidenced by the fact that urban interstate highways generally were much larger and more disruptive than highways local officials sought to build in the 1930s and 1940s, before such roads became part of the proposed national interstate highway system. Second, over time national programs are likely to fall victim to creative lobbying by states and localities for projects that primarily serve local, not national needs.

Use the old road. It may, therefore, be time to take a page out of our history and give responsibility for both funding and building highways and transit systems back to the states and localities. This is not a new idea. Rather, in various forms, it's one that has been embraced in the last two decades by a variety of thoughtful scholars. Most notably, in the early 1990s both Alice Rivlin and Paul Peterson wrote well-received books arguing that we should devolve responsibility for transportation and education (and cut the gas taxes that fund the former program) to the states and localities while giving the federal government primary responsibility for providing an adequate, well-funded social safety net.

The key to this approach is recognizing that states and localities are engaged in fierce competition for economic activity. Consequently, they have tremendous incentives to make investments in areas that will help them compete -- such as education and infrastructure. In contrast, it is much harder for states and particularly localities to fund generous social welfare

programs. Why? Because they are likely to attract those who need such programs and because the taxes needed to fund them could drive away more affluent residents.

Even an ambitious devolution plan should retain a modest federal role, funded by a substantially reduced (but not entirely eliminated) federal gas tax. The primary federal role would be to provide some money so that states maintain those roads needed for a nationally connected highway system. To ensure that the smaller federal program isn't abused, however, states and localities should be required to fund the bulk of the work on those roads. Indeed, even if Congress does not pass a full-scale devolution proposal, it should seriously consider requiring states and localities to pay at least half the cost of all federally aided highway and transit projects to ensure that federal funds are being spent as wisely as possible.

There is also a role for continued federal safety, data collection, and research programs, though the latter, like construction programs, should include requirements for substantial matching funds to ensure that only compelling projects are funded. Again there is historic precedent for such an approach. Before the interstate highway program took shape, the federal Bureau of Public Roads, working with state highway officials, used the modest federal-aid highway program to create a rudimentary national highway system, to set minimal national standards for both new roads, and to both collect important data and conduct a modest national research program on future highway needs.

Though economically compelling, proposals to give states and localities more responsibility for funding highways and transit systems generally have run into three major obstacles. First, many governors and mayors have opposed such plans on the grounds that the federal government is likely to return responsibilities without funding. Such objections, however, can be overcome via program design that carefully links responsibility and funding sources.

Second, some advocates for major projects contend that the approach would lead to lower spending on transportation (which they view as a bad outcome) because states would not raise local gas taxes to replace lost federal revenues. The fact that over the past two decades states have regularly increased their gas taxes to fund highway and transit programs -- and that many of those increases were approved by voters in state and local referenda - suggest, however, that this argument is spurious. Moreover, if the federal government reduced its share of gas tax, states probably would simply keep the tax at its current level and retain the extra revenues.

Third, some environmentalists believe that since federal transportation funds often come with federal environmental regulations, the loss of the latter would lead states to build projects that should not get built. This too is a spurious argument. Many federal environmental laws that limit construction (such as the Clean Water Act's limits on filling or on air pollution) are not directly linked to federal funding, and many states have strong environmental laws of their own. Moreover, if states have to fund roads themselves, they may be less likely to engage in grandiose schemes that require significant displacement or environmental harm. Finally, politicians who advocate such projects run the risk of voter backlash if the voters decide that such projects' social and environmental costs are too high.

In short, TEA-3 offers a fork in the road similar to the mid-1990s "mend it or end it" debates over welfare. On the one hand, Democratic members of Congress can push for a variety of policies and programs that might improve the current programs. To a large extent, doing so would give them the opportunity to curry favor with some key core constituencies such as environmentalists, unions, and big-city mayors. Winning such changes, however, also would require a variety of tradeoffs, such as allowing even more earmarking than the pork-laden TEA-21 legislation.

Such prospects should convince Democrats that it is time to fundamentally change the federal government's role in surface transportation. We should return decisions about investments in

physical capital to states and localities and let the national government take on those issues that it can best address. On first blush, the politics of such a bargain are far from appealing. Yet the issue gives Democrats the opportunity to clearly state that while they believe there are many things that only the federal government can do, there also are many things that it should no longer do. More important, the policy is one that will make life better for the Americans who travel on our roads and take our buses and trains.


David Luberoff is associate director of the Taubman Center for State and Local Government at Harvard University's Kennedy School of Government.

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Legacy of a Landmark: ISTEA After 10 Years

by Ellen Schweppe

When the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was signed into law, it was hailed as a turning point in the history of surface transportation in America. ISTEA was envisioned as landmark legislation that would launch America into the post-interstate era.

Ten years later, has the act with the catchy moniker lived up to its lofty promise?

"ISTEA was indeed a revolutionary act and changed many, many aspects of the highway program and the transportation community," said Thomas Sorel, team leader in the Office of Legislation and Strategic Planning for FHWA. "It has certainly lived up to its reputation."

One of ISTEA's chief goals was to develop a "National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the nation to compete in the global economy, and will move people and goods in an energy-efficient manner."

This was brand new. Instead of focusing on just highway transportation, ISTEA emphasized intermodalism - the seamless linking of highway, rail, air, and marine transportation. The act included many provisions designed to chip away barriers that had separated modes of transportation in legislation and practice for many years.

"ISTEA brought a multimodal thought process to the forefront," said Sorel. "No longer could plans and programs focus only on one modal option. The intermodal

mindset prompted by ISTEA is prevalent today in most transportation agencies."

ISTEA precipitated thousands of changes designed to help fulfill the law's goals - several of them significant enough to be considered a sea change in the way business is conducted in the transportation sector. "Flexibility," "innovation," "involvement," and "collaboration" became the new buzzwords for transportation planning and development.

The \$155 billion act, which authorized federal highway funding for fiscal years 1992 through 1997, transformed the relationship between the federal government and states and localities in terms of funding transportation projects. It restructured the Federal-Aid Highway Program, the vehicle through which states and localities obtain funding for projects.

At the same time, ISTEA gave state and local governments greater flexibility in determining transportation solutions. ISTEA made money available for new kinds of programs, including projects that mitigate traffic congestion, increase safety, and contribute to the attainment of air quality standards. It also opened the transportation planning process to more public involvement than ever before, bringing new players to the table when decisions were being made and increasing collaboration among old players.

ISTEA's successor, the Transportation Equity Act for the 21st Century (TEA-21) built on the key provisions of its predecessor and increased funding for highways, highway safety, and transit for fiscal years 1998 through 2003 to \$218 billion.

New Focus for Programs

Prior to ISTEA, the Federal-Aid Highway Program had been directed primarily toward the construction and improvement of four federal-aid systems - Interstate, primary, secondary, and urban. ISTEA changed that to two - a new National Highway System and the Interstate Highway System.

"ISTEA called for a national reclassification of our highways and a focus on functional classification for eligibility of Federal-Aid Highway Program activities. This was a sorely needed effort in our transportation

systems and simplified the complexity and confusion over functional class and programs that existed prior to ISTEA," said Sorel.

The National Highway System (NHS) was established to focus federal resources on the most important roads in the United States. Its 260,000 kilometers (160,955 miles) include the Interstate Highway System, as well as other roads vital to the nation's economy, defense, and mobility. Although it represents just 4 percent of America's 6.4 million kilometers (4 million miles) of public roads, NHS carries more than 40 percent of the nation's highway traffic.

With the Interstate Highway System essentially completed after nearly four decades of construction, ISTEA shifted emphasis to maintenance rather than wholesale expansion of the highway network. Among other things, it established an Interstate Maintenance Program for resurfacing, restoring, and rehabilitating the Interstate Highway System.



As the word "intermodal" in the title of ISTEA suggests, this bill places a strong emphasis on intermodalism - all modes of transportation working efficiently together. For example, a ferry service transports commuters across San Francisco Bay.



The Bridge Replacement and Rehabilitation Program was continued at a total authorization level of \$16.1 billion. The Veterans Memorial Bridge (formerly known as the Detroit-Superior Bridge) in Cleveland, Ohio, is one of the most significant, historic bridges in Ohio, and it underwent major rehabilitation in the 1990's. (Photo courtesy of the Ohio Department of Transportation)

Directing federal dollars to maintenance was a change in direction, according to Richard Osborne, transportation specialist in FHWA's Office of Legislation and Strategic Planning.

"We're not talking about routine maintenance, such as snowplowing and grass-cutting," he said. "We're talking about preventive maintenance - those activities that can dramatically extend the life of a roadway." That includes such activities as topping a cracked road surface with a seal coat before it deteriorates further, lengthening the time until more extensive and expensive repairs are needed.

"Before ISTEA, funding for maintenance was an anathema," Osborne said.

More Flexibility for States

ISTEA also created the Surface Transportation Program (STP), which brought a new level of flexibility to the funding process. STP dollars can be used for a broad range of highway and transit projects, including federal-aid highways, bridges on public roads, transit capital projects, car-pooling projects, safety improvements, bicycle and pedestrian facilities, and transportation control measures.



ISTEA provided funds for a Scenic Byways Program.

Although STP did not become the block grant-type program originally envisioned, it did open up new categories of projects on which federal dollars could be spent and gave states more leeway in determining where to direct those funds. Under past funding acts, highway funds were strictly for highways and transit funds were for transit. STP changed that.

"Federal highway funds can now be applied to transit projects, such as buying buses and building intermodal centers," said Osborne. "Financing was changed to support the intermodal concept

of eligibility for project funding. States now have a lot more flexibility in deciding how to use funds."

Another ISTEA innovation was the Congestion Mitigation and Air Quality Improvement Program (CMAQ). CMAQ is designed to direct federal funds to transportation projects that help state and local governments improve air quality, a switch from the traditional federal transportation funding goals of mobility and safety. It is central to ISTEA's effort to refocus the transportation planning process toward intermodalism.

CMAQ funds are available for projects ranging from more traditional efforts in traffic flow and transit improvements to projects focusing on the conversion to cleaner fuels for public fleets. Program funds have been used to establish ride-share services, promote employer trip-reduction programs, and support bicycle and pedestrian travel - all with the goal of improving air quality and reducing traffic congestion.

At first, CMAQ funds were available only for projects in areas that failed to meet national air quality standards set by the Clean Air Act. Later, the law was changed so that areas in compliance for air quality standards could use CMAQ funds to stay that way.

"There had been some controversy before the change because if you instituted projects and your area came into compliance, you couldn't get funding anymore," Osborne said.

ISTEA also funded a variety of special programs that states could tap into to accomplish such transportation-related goals as increasing use of safety belts and motorcycle helmets, developing state scenic byways and recreational trails programs, and conducting research and development to resolve highway problems.

"Bottom line, ISTEA meant more money for states and a huge change in programs and program eligibilities," said Osborne.



Kingston Station in South Kingstown, R.I., was built in 1875, and it is believed to be one of the oldest, consecutively used train stations in the country. It was restored to serve as an intermodal transportation center, accommodating bus; bicycle; taxi; automobile; Amtrak, including high-speed rail service; and commuter rail service. The building was renovated to incorporate modern features and conveniences while preserving the building's original appearance and historic character as much as possible. (Photo courtesy of the Rhode Island Department of Transportation)

Guaranteed Funding

While ISTEA gave states more flexibility in deciding how to use federal transportation funds, its successor, TEA-21, offered them a new planning tool: guaranteed funding. For the first time, spending for highways, highway safety, and transit was protected by "firewalls" that kept it from being reduced to increase spending for other discretionary budget programs. This put highway spending in a category with defense and violent crime reduction, which also have firewall protection.

In a major change to federal budget rules, highway and transit programs are now guaranteed a minimum level of spending. Before TEA-21, funding for surface transportation programs was one item among many on a list of priorities for federal program spending in the budget.



Under ISTEA, Transportation Enhancement Program funds could be used for the construction of pedestrian and bicycle facilities, such as pedestrian bridges.

Now, guaranteed amounts for highway spending are linked to actual Highway Trust Fund receipts and can be used only to support projects eligible under federal highway and highway safety programs.

That means a state's obligation limitation - the ceiling on the amount of federal assistance that a state may obligate for transportation projects during a fiscal year - is essentially guaranteed.

Although it has not happened, the possibility exists that Highway Trust Fund tax receipts could drop far enough below projected levels to reduce the amount of funding available to states.

"There's always an exception to the rule," said Osborne. But guaranteed funding provides a mechanism that allows states to plan complex transportation programs in advance and have a reasonable expectation of having the funds to pay for them.

"Guaranteed funding provides predictability. States not only know how much funding they will receive through authorizations, they know how much they can actually spend in a given fiscal year," said Osborne. "This is a dramatic change. It's a whole new way of operating for states that makes it easier for them to plan and

develop transportation programs."

Involving Stakeholders

ISTEA heralded a new philosophy in designing and planning transportation programs - public involvement.

"Highway development had some element of public participation prior to ISTEA, but not to the extent that ISTEA required," said Sorel.

Transportation stakeholders, ranging from the freight community to environmental groups to bicyclist and pedestrian interests, saw the increased array of ISTEA's funding opportunities and wanted to participate in the planning process. As a result, many states revamped their planning and program development processes to accommodate the new demand for stakeholder involvement.

"The processes became more open and responsive to the needs of the myriad of transportation stakeholders, including the general public," said Sorel. And the shifts in the planning and program development processes formed the basis for shifts in other functional areas. "Some states began including public participation in the design process and the environmental process," he said. "It was the new spirit of things."

The Transportation Enhancement Program, part of STP, is one ISTEA program that embodies the spirit of public participation. The program opens up the Federal-Aid Highway Program to new types of activities, such as construction of pedestrian and bicycle facilities, acquisition of scenic and historic sites, rehabilitation of historic transportation facilities, archeological planning and research, control and removal of outdoor advertising, and mitigation of water quality effects from roadway runoffs.

Although not a big-dollar item compared to other ISTEA programs, the Transportation Enhancement Program has had a major impact because of its visibility, according to Sorel. It has attracted considerable interest from many state and local officials because it resonates with constituents.

"The program provided an unprecedented level of access to transportation funding for many groups and members of the general public. Thus, high-level officials had a newly found interest in the transportation concerns of their constituents," he said. "It has turned out to be one of the most competitive programs in ISTEA. States typically have more applicants for programs than they can fund."

Increased Collaboration

In addition to increasing public participation, ISTEA also prompted an unparalleled level of collaboration in the transportation community.

"New players became involved with programs such as transportation enhancements, recreational trails, and CMAQ," Sorel said. "These new players were often very passionate about their interests and demanded to be heard. Thus, a new balance of power in the community was born."

Increased collaboration is a key part of the new intermodal mindset.

"Before ISTEA, highway options were always the first consideration. Any other options, such as transit, were secondary," Sorel said. "ISTEA gave all options equal standing in the decision-making process." The trend toward collaboration has not happened overnight. "Some states are still struggling with this," he said. "Some are better than others."

ISTEA drove organizational restructuring in many transportation agencies because of the new emphasis on intermodalism and public participation and the raft of program changes.

"Many state highway departments weren't set up to administer the new programs," he said. "They actually created new teams to address such things as transportation enhancements, CMAQ, and bike/pedestrian projects."

Not only did ISTEA influence organizational change, it had an effect on many activities beyond the purview of federal oversight.

"Many organizations redefined their entire statewide and metropolitan planning and program development processes to be consistent with ISTEA philosophies," Sorel said.

Originally, ISTEA called for states to establish management systems to set priorities for transportation projects in six areas - highway pavement, bridges, highway safety, traffic congestion, public transportation facilities and equipment, and intermodal transportation facilities and systems. Management systems are designed to help states address transportation needs from a technical standpoint so that decisions are not purely politically driven.

Before ISTEA, many states had in place some management system elements, such as those to manage highway pavement and bridge programs, but for other states, it was a new way of operating. Although ISTEA's requirement for states to create management systems was later modified, it has had a long-term influence on many state highway departments, according to Sorel.

"While this was very controversial because it was perceived as an unfunded mandate, it did prompt a serious discussion about the importance of management systems in the transportation community," he said. "While many states dropped

some of the mandated systems, many have survived and proved to be extremely valuable. In many cases, this would not have occurred if the ISTEA management systems provisions didn't exist."



Transportation Enhancement Program funds could also be used for archeological planning and research. A village settled by Native Americans between 400 and 200 B. C. was discovered by archaeologists conducting a study for the Arizona Department of Transportation in conjunction with the reconstruction of an I-10 interchange near Tucson.

Continuing ISTEA's Legacy

When Congress was considering ISTEA a decade ago, it was asking the basic question, "What is the federal government's role in surface transportation now that the Interstate Highway System is essentially complete?" Congress' answer was a

far-reaching act that, as we can see 10 years later, left a legacy in the way federal highway programs are structured, planned, developed, and financed. ISTEA has broadened federal efforts from a focus on highway transportation to an intermodal mindset. It made wholesale changes to programs, eliminating the Primary, Secondary, and Urban programs and creating NHS and STP as well as a dozen other programs. It has redefined programs eligible for federal funding to include new kinds of transportation-related activities, such as those that contribute to cleaner air and provide facilities for bicyclists and car-poolers.

Also, ISTEA has given states increased flexibility in determining how to spend federal dollars. ISTEA has transformed the transportation planning and development process, giving new stakeholders a stronger voice and increasing opportunities for collaboration among those in the transportation community.

TEA-21 continued the major features of ISTEA, but it is not merely an extension of ISTEA with more funding. It represents an enormous change as did ISTEA but in a different direction. TEA-21 is a budgetary bill that changed the way the Federal-Aid Highway Program exists within the budget of the United States. It focuses on equity - hence, its name - creating the Minimum Guarantee and Revenue Aligned Budget Authority programs and providing guaranteed funding as well.

Work is underway at FHWA on the next round of reauthorization for federal highway programs, slated for 2003. The upcoming round is expected to build on the legacy of ISTEA and TEA-21.

"There's a lot of sentiment to continue along this path," said Sorel. "People are fairly happy with the way it has worked out."

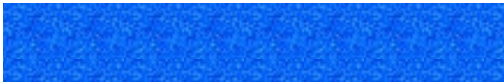
Ellen Schweppe is the president of Ellen Schweppe Co., an editorial and public relations services corporation. She writes occasionally for *Public Roads*.

Other Articles in this Issue:

Legacy of a Landmark: ISTEA After 10 Years

[Creating a Landmark: The Intermodal Surface Transportation Act of 1991](#)

["Put the Brakes on Fatalities" Day](#)



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United States Department of Transportation - Federal Highway Administration

GAO

Testimony

Before the Subcommittee on Highways,
Transit, and Pipelines, Committee on
Transportation and Infrastructure, House
of Representatives

For Release on Delivery
Expected at 10:00 a.m. EDT
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INTERMODAL TRANSPORTATION

Challenges to and Potential Strategies for Developing Improved Intermodal Capabilities

Statement of Katherine Siggerud, Director
Physical Infrastructure Issues





Highlights of [GAO-06-855T](#), a testimony before the Subcommittee on Highways, Transit, and Pipelines, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

Mobility—that is, the movement of passengers and goods through the transportation system—is critical to the nation’s economic vitality and the quality of life of its citizens. However, increasing passenger travel and freight movement has led to growing congestion in the nation’s transportation system, and projections suggest that this trend is likely to continue. Increased congestion can have a number of negative economic and social effects, including wasting travelers’ time and money, impeding efficient movement of freight, and degrading air quality. U.S. transportation policy has generally addressed these negative economic and social effects from the standpoint of individual transportation modes and local government involvement. However, there has been an increased focus on the development of intermodal transportation. Intermodal transportation refers to a system that connects the separate transportation modes—such as mass transit systems, roads, aviation, maritime, and railroads—and allows a passenger to complete a journey using more than one mode. My testimony today is based on GAO’s prior work on intermodal transportation, especially intermodal ground connections to airports, and addresses (1) the challenges associated with developing and using intermodal capabilities and (2) potential strategies that could help public decision makers improve intermodal capabilities.

www.gao.gov/cgi-bin/getrpt?GAO-06-855T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Katherine Siggerud at (202) 512-2834 or siggerudk@gao.gov.

INTERMODAL TRANSPORTATION

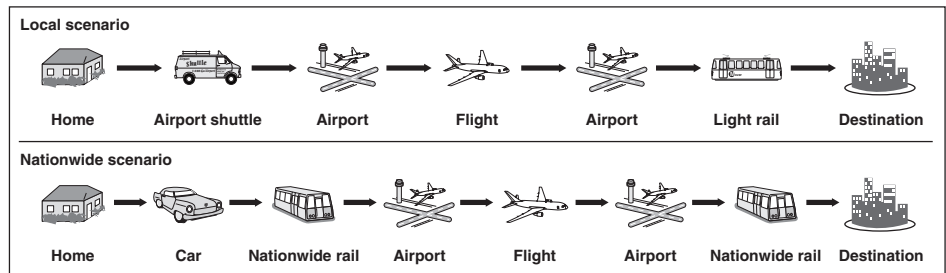
Challenges to and Potential Strategies for Developing Improved Intermodal Capabilities

What GAO Found

A number of financing, planning, and other challenges play significant roles in shaping transportation investment decisions and the development of intermodal capabilities. Significant challenges to the development of intermodal capabilities are the lack of specific national goals and funding programs. Federal funding is often tied to a single transportation mode; as a result it may be difficult to finance projects, such as intermodal projects, that do not have a source of dedicated funding. In addition, federally funded transportation projects, including intermodal projects, face a number of planning challenges. These challenges include limits on the uses of federal funds, ensuring that widespread public participation is reflected in decisions, physical and geographic land constraints, and the difficulty coordinating among multiple jurisdictions in transportation corridors. Finally, intermodal capabilities, while offering benefits to mobility, may need to develop a demand over time.

Two general strategies developed from GAO’s prior work would help public decision makers improve intermodal capabilities. Both strategies are based on a systematic framework that includes identifying national goals, defining the federal role, determining funding approaches, and evaluating performance. The first strategy would increase the flexibility of current federal transportation programs to encourage a more systemwide approach to transportation planning and development, but would leave project selection with state and local decision makers. The second strategy is a fundamental shift in federal transportation policy’s focus on local decision making by increasing the role of the federal government in order to develop more integrated transportation networks. While the first strategy would most likely lead to a continued focus on locally determined and developed transportation projects, the second strategy could develop more integrated transportation networks, either nationwide or along particularly congested corridors. The second strategy could be costly, and high benefits, which may be difficult to achieve, would be needed to justify this investment.

Two Examples of Intermodal Connections for an Airline Passenger



Source: GAO.

Mr. Chairman and Members of the Subcommittee:

Mobility—that is, the movement of passengers and goods through the transportation system—is critical to the nation’s economic vitality and the quality of life of its citizens. Mobility provides people with access to goods, services, recreation, and jobs; provides businesses with access to material, markets, and people; and promotes the movement of personnel and material to meet national defense needs. However, increasing passenger and freight travel has led to growing congestion in the nation’s transportation system, and projections of future passenger travel and freight movement suggest that this trend is likely to continue. For example, the number of airplane passengers using U.S. airports is expected to grow from over 746 million in 2005 to almost 1 billion by 2015 and, since most travelers use cars, whether privately owned or taxis, to get to the airport, local cities and communities will face increased congestion on their airport access roads and highways. In addition, freight traffic on roadways has increased fourfold over the last two decades, and both rail and highway congestion are particularly severe in urban areas where ports for international trade are located. For example, in the Los Angeles area, freight traffic is projected to more than double along the two mainline freight railroads from 2003 to 2025. Increased congestion can have a number of negative economic and social effects, including wasting travelers’ time and money, impeding efficient movement of freight, and degrading air quality. These effects are especially problematic in areas and transportation corridors that are already heavily congested. Such congestion may be relieved by intermodal transportation options—that is a system that connects the separate transportation modes and allows a passenger or freight to complete a journey using more than one mode, such as bus, air, rail, and waterways.

Our past work has shown that the development of intermodal capabilities can provide a range of benefits. Those benefits include potentially reduced travel times and costs for travelers and freight by providing alternative transportation options and eliminating freight “chokepoints” or bottlenecks at entrances to freight facilities, and reduced road congestion with the potential for an associated reduction in vehicle emissions and improved air quality. Intermodal transportation capabilities are typically initiated by state and local transportation agencies, including some combination of state departments of transportation, local transportation planning bodies (i.e., metropolitan planning organizations), airports, seaports, and local transit agencies. The federal government’s role is primarily one of funding and oversight through separate transportation programs within the Department of Transportation (DOT). My testimony

today is based on our prior work on intermodal transportation, and addresses (1) the challenges associated with developing and using intermodal capabilities and (2) potential strategies that could help public decision makers improve intermodal capabilities. In particular, I will be drawing a number of examples from our July 2005 report on ground access and intermodal connections at airports.¹ (See Related GAO Products.)

In summary:

- Financing, planning, and other challenges play important roles in shaping transportation investment decisions and the development and use of intermodal capabilities. Significant challenges are the lack of specific national goals and funding programs to develop intermodal capabilities. Federal funding is often tied to a single transportation mode; as a result it may be difficult to finance projects, such as intermodal projects, that do not have a source of dedicated funding. This may also make it difficult to use federal funds to finance the best transportation investment, regardless of mode, to improve mobility. In addition, federal transportation projects, including intermodal projects, face a number of planning challenges that include limits on the uses of federal funds, ensuring that widespread public participation is reflected in decisions, physical and geographic land constraints, and the difficulty in coordinating among multiple jurisdictions in transportation corridors. Finally, intermodal capabilities, while offering benefits to mobility, may need to develop a demand over time. For example, in the case of ground access to airports, most passengers may prefer to use private vehicles to access airport over transit options.
- Two general strategies could help public decision makers improve intermodal options. Both of these strategies are based on a systematic framework that includes identifying the federal interest in and national goals for transportation, defining the federal role, determining funding approaches, and evaluating performance. In the first strategy, Congress would increase flexibility within current federal transportation programs to encourage the development of intermodal capabilities and transportation investments that offer the best mobility improvements by shifting federal transportation funding, which is generally focused on individual transportation modes, to a more systemwide approach across all modes and types of travel. This strategy would include having the

¹GAO, *Intermodal Transportation: Potential Strategies Would Redefine Federal Role in Developing Airport Intermodal Capabilities*, [GAO-05-727](#) (Washington, D.C.: July 26, 2005).

federal government develop approaches to target funding on transportation investments that better focus on outcomes related to national goals and promote better coordination between jurisdictions. The second strategy is a fundamental shift in federal transportation policy's long-time focus on state and local decisionmaking by increasing the role of the federal government in planning and funding intermodal projects in order to develop more integrated transportation networks, either nationwide or along particularly congested corridors. To develop a nationwide intermodal system, the federal government could take on a role similar to its efforts to develop the interstate highway system. A more active federal government role might also require additional federal funding responsibilities. For example, if the federal government were to take a more active role in developing airport intermodal capabilities that included enhancing or expanding rail service or developing high-speed rail corridors, it might also need to increase its funding role, and the role of other beneficiaries of the service, due to its high cost.

Background

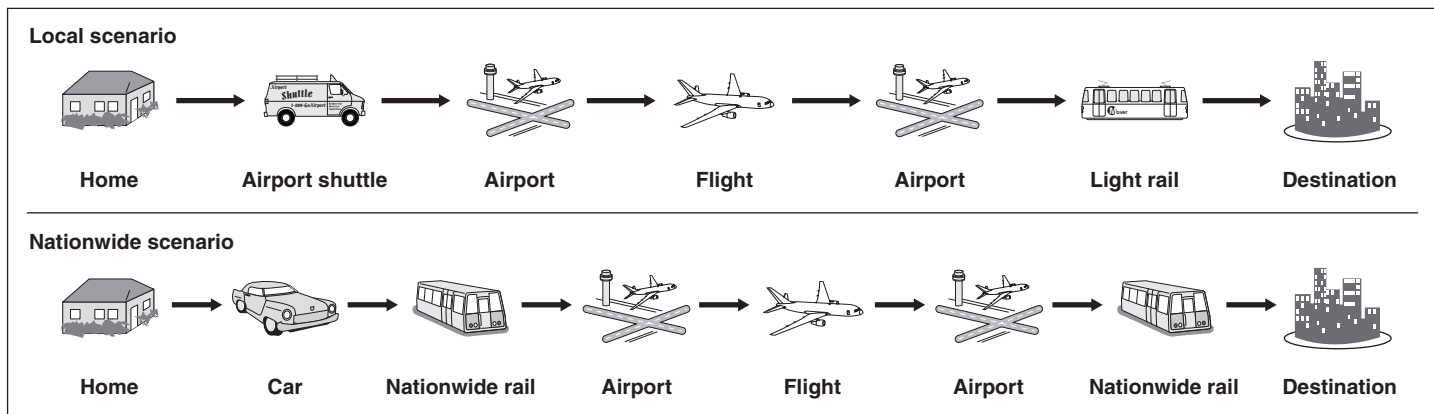
Historically, federal transportation policy has generally focused on individual modes rather than intermodal connections between different modes. Federal transportation funding programs are overseen by different modal offices within DOT—the Federal Aviation Administration (FAA), Federal Transit Administration (FTA), Federal Railroad Administration, and Federal Highway Administration (FHWA). No specific federal funding programs have been established that target intermodal projects for either passengers or freight although a few federal programs offer flexibilities that would allow these types of projects.

Intermodal transportation refers to a system that connects the separate transportation modes—such as mass transit systems, roads, aviation, maritime, and railroads—and allows a passenger or freight to complete a journey using more than one mode. For example, an efficient intermodal capability at an airport would provide a passenger with convenient, seamless transfer between modes; the ability to connect to an extended transportation network; and high frequency of service among the different modes. As shown in figure 1, an intermodal connection at an airport might involve a passenger arriving at the airport by private shuttle service, flying to another airport, and then transferring to local rail service² or a nationwide system, such as Amtrak, to reach a final destination. Similar to airline passengers, an intermodal freight transportation system relies on

²Local transit rail includes commuter rail, light rail, subway systems, and trolleys.

ready transport of cargo between ships and other transportation modes, particularly highway and rail.

Figure 1: Two Examples of Intermodal Connections for an Airline Passenger



Source: GAO.

The scope and nature of intermodal passenger connections is further illustrated by ground access to airports. In 2005, we reported that most major U.S. airports have direct intermodal ground connections to either local transportation systems or nationwide bus or rail networks.³ Sixty-four of the 72 airports⁴ that we surveyed reported having direct connections⁵ to one or more local transportation systems in their area, such as local bus or rail service, with 26 airports reporting having both. The most common type of public transportation system available to and from the airport is local bus service. Sixty-four airports reported having a direct connection to a local bus service. However, the level of bus service varies depending on the airport. For example, Seattle-Tacoma International Airport has five public bus routes that serve the surrounding

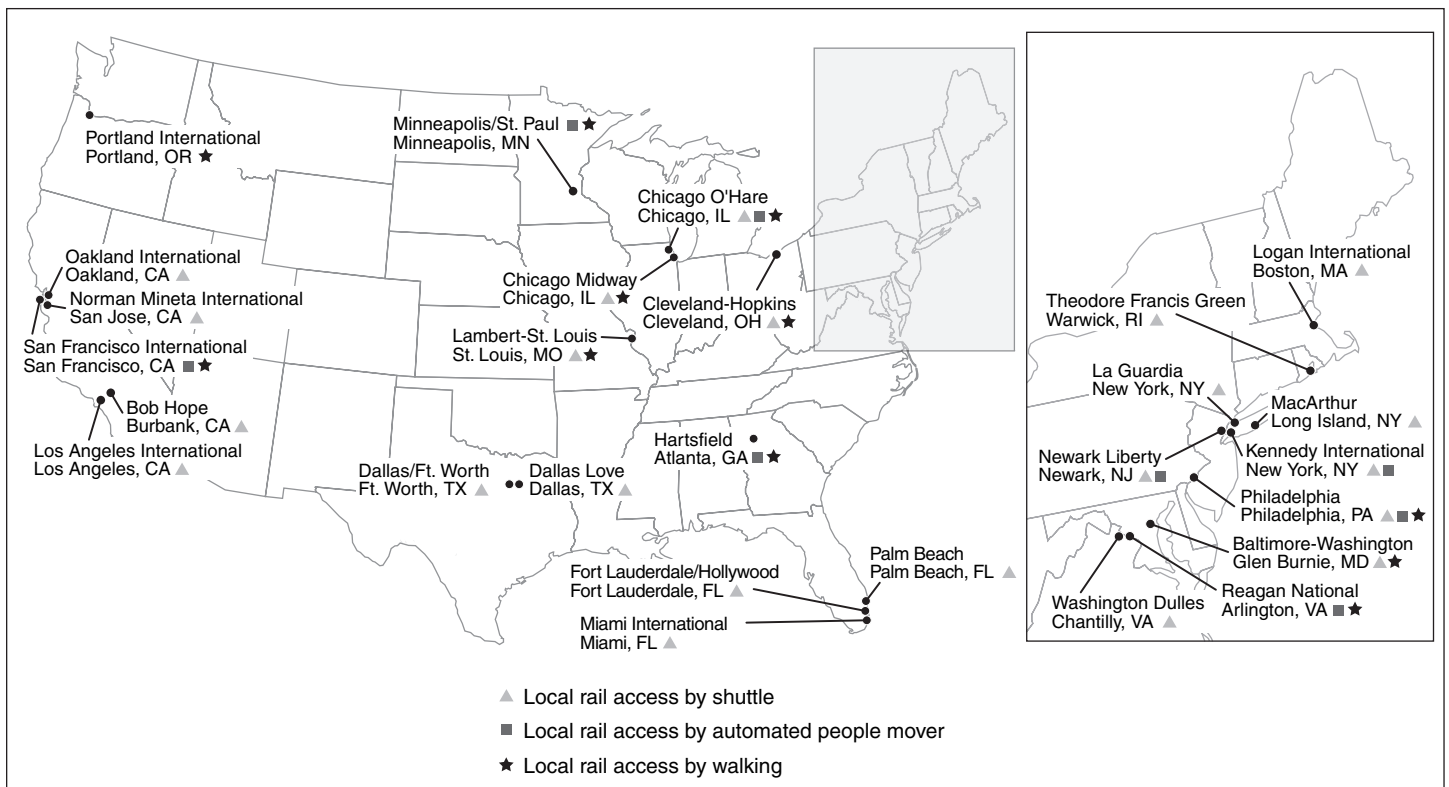
³GAO-05-727.

⁴We surveyed all 68 large and medium hub U.S. airports, and those small hub airports (4 in total) that are located in the same metropolitan statistical area as one or more large or medium hub airports.

⁵We considered a transfer point (such as a bus stop or rail station) to be a direct connection to the airport if (1) it was convenient for an average adult with luggage to walk to the transfer point from any of the airport's terminals; (2) the airport had an automated people mover that transports passengers from the transfer point to any of the airport's terminals; or (3) there was regular, fixed-route shuttle service from the transfer point to any of the airport's terminals.

communities, while General Mitchell International Airport in Milwaukee has only one route that serves the airport. Twenty-seven airports reported having a direct connection to a local rail system, such as light rail, commuter rail, or subway. (See fig. 2.)

Figure 2: Major U.S. Airports with Direct Connections to Local Rail Systems

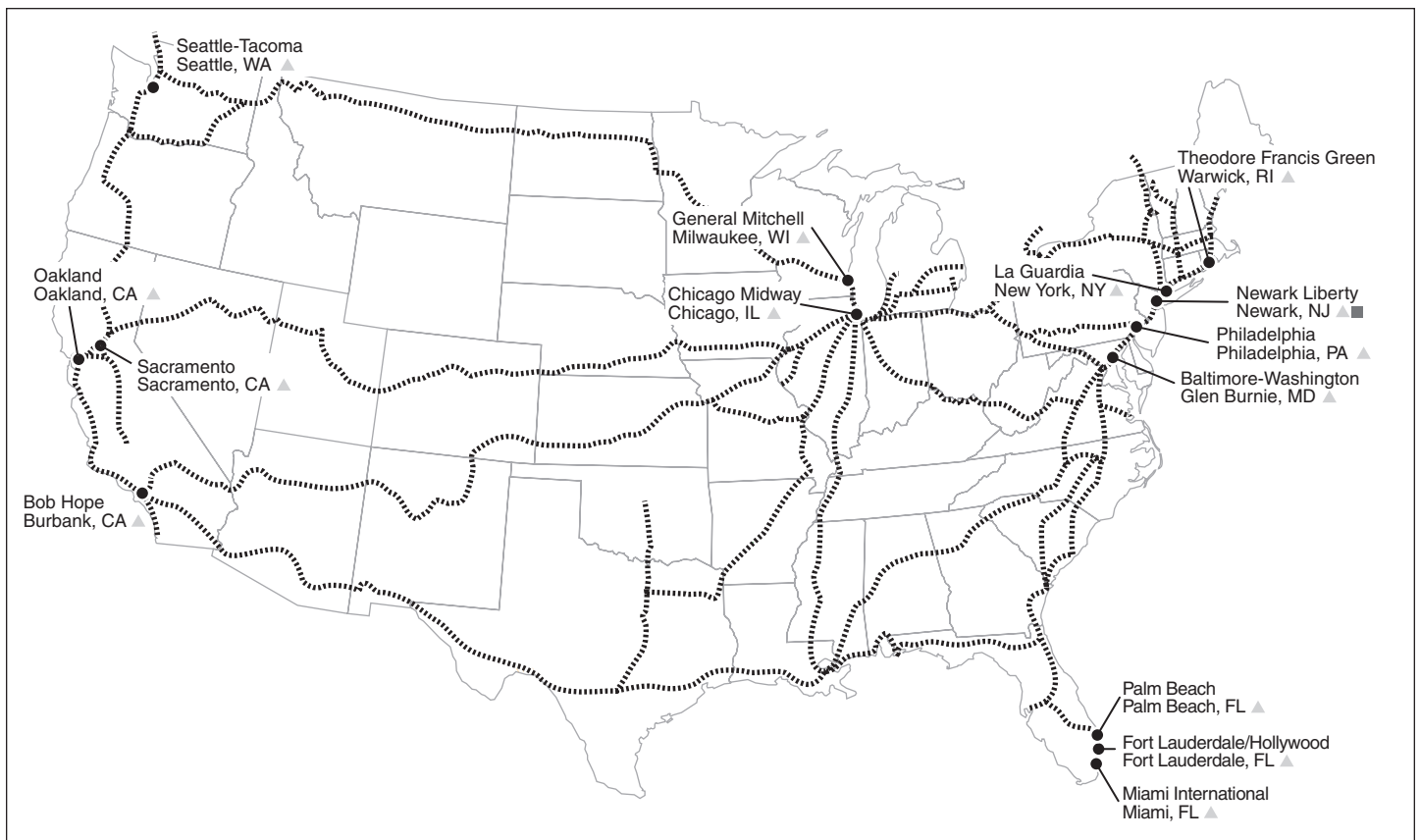


Source: GAO summary of data from 72 airports.

While most major U.S. airports are located in metropolitan areas that have stations for nationwide transportation systems, such as Greyhound or Amtrak, 20 airports reported having direct connections to nationwide bus service or nationwide passenger rail service. Twelve of the 20 airports reported having direct connections to nationwide bus service, and 14 airports reported having a direct connection to Amtrak rail service. (See fig. 3.) All 14 airports provide shuttle service to transport passengers to Amtrak stations that serve the metropolitan area. One of the 14 airports—Newark's Liberty International Airport—reported that passengers could also access the Amtrak station by an automated people mover. In addition, the accessibility of Amtrak to Newark airport has allowed Continental

Airlines to establish a code share agreement with Amtrak, whereby passengers can purchase one ticket for a journey that includes travel by both air and rail.⁶ This agreement has allowed Continental Airlines to eliminate some short-haul flights from Newark.⁷

Figure 3: Major U.S. Airports with Direct Connections to Amtrak's Nationwide Rail Systems



- Amtrak
- ▲ National rail access by shuttle
- National rail access by automated people mover

Source: GAO.

⁶Code sharing refers to the practice of airlines applying their own names and selling tickets to flights or rail service operation by other carriers.

⁷Continental officials stated that in April 2003, they reinstated limited air service between Newark and Philadelphia because of market demand.

While there is no single federal funding source for rail to airport projects, we found that local governments, airports, and transit systems were able to tap and package a variety of federal funds to pay for recent rail connections to airports. These included direct appropriations, the New Starts program for fixed guideway transit systems, two federal aid highway categories—the Congestion Mitigation and Air Quality Improvement Program and the Surface Transportation Program—and passenger facility charges at airports. Appendix I describes these programs.

Several Significant Challenges Affect the Development and Use of Intermodal Capabilities

According to transportation research, planning officials, and our prior work, a number of financing, planning, and other challenges play important roles in shaping transportation investment decisions and the development of intermodal capabilities. Significant challenges to the development of intermodal capabilities are the lack of specific national goals and funding programs. Federal funding is often tied to a single transportation mode; as a result it may be difficult to finance projects, such as intermodal projects, that do not have a source of dedicated funding. Federal legislation⁸ and federal planning guidance all emphasize the goal of establishing a systemwide, intermodal approach to addressing transportation needs. However, the reality of the federal funding structure—which directs most surface transportation spending to highways and transit and is more oriented to passengers than freight—plays an important role in shaping local transportation investment choices.⁹ In addition to the focus on highways and transit over other investment choices, we found limited instances in which investment decisions involved direct trade-offs in choices between modes or users—such as railroad versus highway or passenger versus freight.¹⁰

⁸The Intermodal Surface Transportation Efficiency Act of 1991; the Transportation Equity Act for the 21st Century, enacted in 1998; and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, enacted in 2005.

⁹While most federal funding sources and programs are linked to highway or transit uses, some funding flexibility between highway and transit is allowed under programs such as the National Highway System, Surface Transportation Program, and Congestion Mitigation and Air Quality Improvement Program. Federal programs provide limited support for investment in railroad infrastructure.

¹⁰GAO, *Surface Transportation: Many Factors Affect Investment Decisions*, [GAO-04-744](#) (Washington, D.C.: June 30, 2004).

A significant challenge to developing certain intermodal connections is the difficulty of securing funding within the mode-specific federal funding structure. The cost of intermodal projects can vary widely, depending on the complexity and scope of the project. In addition, measuring and forecasting the benefits from individual projects can be hard to quantify, and we found only anecdotal evidence of benefits for the 16 intermodal projects we examined.¹¹ The costs of rail projects are typically substantial and can include costs to construct a station, as well as track and other infrastructure to support the rail network. Table 1 provides examples of the costs of intermodal projects at airports and funding sources. We found that many intermodal projects at airports fit the funding criteria for one or more federal programs focused on surface transportation or aviation. For example, FTA's New Starts program is a significant source of funding for intermodal capabilities at airports that are part of a rail transit system. However, the rigorous rating process and increasing demands for its limited funds make the New Starts program time-intensive and competitive in nature and has made it difficult for local transportation agencies to secure this funding, according to local officials that we spoke with. Federal funding programs, like the New Starts program, will contribute only a portion of the total project costs, subject to local matching funds, which can be derived from local agencies such as metropolitan transportation authorities, transit agencies, and airport authorities.¹² However, local transportation officials said it can be difficult to secure local funds for intermodal projects at airports because these agencies could potentially have different funding priorities, making it difficult to build the unified local support necessary to secure funding.

¹¹Our case study airport locations were Baltimore-Washington International, General Mitchell International, John F. Kennedy International, La Guardia, Los Angeles International, Metropolitan Oakland International, Miami International, Minneapolis/St. Paul International, Newark Liberty International, Norman Y. Mineta San Jose International, Ontario International, Portland International, Ronald Reagan Washington National, San Francisco International, Seattle-Tacoma International, and Washington Dulles International. The airports were selected to provide a range of airport sizes (medium and large), planned or existing types of intermodal service, and geographic locations.

¹²For selected New Starts projects, a maximum of 80 percent federal contribution to total project costs can be funded, but projects that request a maximum federal share of 60 percent of the project's total cost receive higher priority.

Table 1: Examples of Intermodal Project Costs and Funding Sources

Dollars in millions

Project description	Capital costs ^a	Funding sources
Construction of a new Amtrak rail station adjacent to and serving Milwaukee's General Mitchell International Airport, and improvements to the existing rail line, which already provided service between Milwaukee and Chicago	\$6.8 ^b	<ul style="list-style-type: none"> • Two separate annual federal appropriations • Wisconsin Department of Transportation
5.5-mile light rail line (Metropolitan Area Express) extension to existing rail line to provide service between city center and Portland (Oregon) International Airport	\$154 ^c	<ul style="list-style-type: none"> • Tri-Met (local transit agency) • Airport passenger facility charges • City of Portland • Cascades Development Corporation (a private land development corporation)
New light rail system (Hiawatha Light Rail) providing service between downtown Minneapolis and the Mall of America, with two stations located at Minneapolis/St. Paul airport	\$715.3 ^d	<ul style="list-style-type: none"> • New Starts • Congestion Mitigation and Air Quality grant • Hennepin County Regional Rail Authority • Metropolitan Airports Commission

Source: GAO analysis of interviews conducted with, and documents provided by, airport and transportation officials.

^aCapital costs are approximations as reported by airport or local transportation officials.

^bAmount is expressed in 2005 dollars and includes the construction of a new building, boarding platform, canopy, parking facility, and several miles of rail improvements, including upgraded rail technology.

^cAmount is expressed in 2001 dollars and includes engineering, design, vehicle acquisition, and construction and system installation.

^dAmount is expressed in nominal dollars (1999-2004) and includes costs for the engineering, design, acquisition of 24 vehicles, construction and 12-mile system installation, 17 stations, and tunnel construction to access the two airport stations.

Additionally, intermodal capabilities at airports can be funded with passenger facility fees, commonly referred to as PFCs.¹³ Local transportation officials also described difficulties in securing the use of PFCs. In particular, requirements that PFC funds be used for projects on airport property, among other criteria, are seen as limiting their use for intermodal projects. Moreover, airlines support these restrictions on the use of PFC funds, believing that these funds are for airport development and capacity improvements, and not ground-access projects. However, even with this restriction, we reported in July 2005 that four airport

¹³PFCs are fees up to \$4.50 paid by airport passengers, which are used to finance airport capital improvements.

authorities were using PFC funds to develop or contribute to intermodal projects at airports, as shown in table 2.

Table 2: Selected Examples of Intermodal Rail Projects Funded by Passenger Facility Charges (PFC)

Dollars in millions^a

Location	Project description	Funding amounts from PFCs
Portland, Ore.	Light rail extension and new station at Portland International Airport	\$43
Newark, N.J.	People mover system 1-mile connection from Newark Liberty International Airport to new Northeast Corridor rail station	\$357
New York, N.Y.	People mover system 3-mile connection from John F. Kennedy International Airport to two transit rail stations	\$1,326
St. Louis, Mo.	On-airport transit station at St. Louis Lambert Field International Airport	\$4

Source: GAO analysis of FAA data.

Note: These projects have been approved by FAA and airports have begun collecting PFC funds. FAA has approved the use of PFC funds for additional projects for which airports have not yet started collection PFC funds.

^aFunding amounts are rounded to the nearest million.

In addition to the limits on the use of federal funds, federal transportation projects, including intermodal projects, face a number of planning challenges including the following:

- Decision makers must ensure that wide-ranging public participation is reflected in their deliberations and that their choices take into account numerous views. During the planning of an intermodal project, the lead local agency’s responsibilities include soliciting public comment regarding the most appropriate project to select for the area. This public participation can introduce considerations such as quality of life and other issues that are difficult to quantify in making transportation choices. It also puts decision makers in the position of balancing different public agendas about funding and values.
- The physical constraints of an area may present a challenge to building intermodal facilities. The development of intermodal capabilities at airports provides an example of this challenge. On the one hand, our work has found that densely populated urban areas offer few alternatives for expansion or new project development. On the other hand, it is these same densely populated urban areas where rail connections to airports are more

likely to generate benefits that will justify the costs, as these areas may have high levels of congestion and larger numbers of people willing to use public transportation to access airports as a result. For example, since the proposed light rail line into the Minneapolis/St. Paul International Airport crossed land owned by various federal agencies, the process to gain the needed right-of-way was a multiagency effort that required significant coordination, adding somewhat to the project planning time and costs.

- Multijurisdictional transportation corridors present special challenges in coordinating investment decisions. Getting the cooperation of and coordination between these different officials can make the planning and implementation of multistate and multiregional projects difficult. For example, during the planning of the Seattle light rail, Sound Transit officials noted that the alignment from downtown Seattle to the Seattle-Tacoma International Airport ran through a number of surrounding cities and required three local cities to approve permits for the construction of the project.

The effective use of passenger rail as an intermodal option along heavily traveled air and highway corridors also poses challenges due to limitations of the existing nationwide rail network. For example, Amtrak's passenger rail network does not support air-rail service requirements because rail lines do not go near some airports, passenger train schedules in some parts of the country are not frequent enough to effectively link to airline flight schedules, and transferring from air to rail poses inconveniences that limit consumer demand. As we discussed previously, although 14 airports reported having a direct connection to Amtrak's passenger rail service, 1 reported that passengers could access the station by automated people movers—others required boarding a shuttle. In addition, although Amtrak track lines are adjacent to the Cleveland Hopkins International Airport, Amtrak officials stated that Amtrak trains run only twice a day along this line, which is not frequent enough to establish a code share agreement with an airline.

Furthermore, transportation industry experts and European transportation officials have pointed out that high-speed passenger rail, including connections to congested airports, has provided an alternative for air travel in short-haul markets in Europe. There has been a reduction of air service between Paris, France, and Brussels, Belgium—a popular short distance city pair for travelers—due, in part, to the high-speed train service linking Paris Charles de Gaulle Airport and downtown Paris with Brussels. In the United States, few efforts have been made to use rail service to complement air service in this manner because, in part, the cost

of establishing service is not likely to justify its benefits given that some distances are too great for rail to provide an attractive alternative transportation mode.

Finally, intermodal capabilities, while offering benefits to mobility, may need to develop a demand over time. For example, the development and use of intermodal connections at airports can be limited by the inability of the ground connections to meet the preferences of airline passengers, therefore, the majority of passengers still use private vehicles to access airports even when transit service is available. Passenger preferences can include seamless transitions from one mode to another; a simplified process to handle baggage; transit schedules that meet consumer demands; and clear, easy-to-follow information on accessing transportation options—including signs at airports and information at hotels on accessing transit to airports. In addition, passengers, particularly those traveling with children and large amounts of luggage, may not consider using transit or rail systems to complete their travel plans due to inconvenience.

Two General Strategies Could Help Address Intermodal Financing and Planning Challenges

Two general strategies could help public decision makers improve intermodal options. These strategies are based on a systematic framework that has the following three components:

- Set national goals for the system. These goals, which would establish what federal participation in the system is designed to accomplish, should be specific and measurable.
- Clearly define the federal role relative to the roles of state and local transportation agencies and the private sector. The federal government is one of many stakeholders involved in the development of intermodal capabilities. This component is important to help ensure that the federal role supplements and enhances the participation of other stakeholders and appropriately balances public investment when the benefits flow in part to the private sector.
- Determine which funding approaches—such as alternatives to investment in new infrastructure and those approaches that reward projects that advance national/federal goals—will maximize the impact of any federal investment. This component can help expand the ability to leverage funding resources and promote shared responsibilities. Given the current budgetary environment, and the long-range fiscal challenges confronting

the country, substantial increases in funding for transportation projects will require a high level of justification.

In addition, either strategy would be enhanced by a process for evaluating performance periodically to determine if the anticipated benefits from federally-funded projects are accruing as expected.

In the first strategy, Congress could encourage the development of intermodal capabilities by increasing the flexibility with current federal transportation programs, which are largely focused on individual transportation modes, to a more systemwide approach across all modes and types of travel. To promote intermodal development, the federal government could consider several alternatives for transportation planning and funding that might better focus on these outcomes and promote better coordination between jurisdictions. These alternatives include the following:

- Increasing the flexibility of federal transportation funding programs to help break down the current funding stovepipes.
- Applying different federal matching criteria for different types of expenditures in order to provide a higher level of federal matching for projects that reflect federal priorities.
- Establishing performance-oriented funding or a reward-based system that would favor those entities that address the national interest and meet established intermodal goals.
- Expanding support for alternative financing mechanisms—such as providing credit assistance to state and local governments for capital projects and using tax policy to provide incentives to the private sector for investing in intermodal capabilities—to access new sources of capital and stimulate additional investment in intermodal capabilities.
- Aligning incentives for planning agencies to adopt best practices and to achieve expectations.

While this strategy would involve changes in federal transportation policy, it would most likely not involve a major shift in the federal role, which would continue to be focused on funding and oversight of locally determined and developed transportation projects. However, since this strategy would include the goal of establishing a more systemwide approach to transportation planning, the federal government would need

to determine the scope of its involvement in encouraging such an approach.

The second strategy is a fundamental shift in federal transportation policy's long-time encouragement of state and local decision making by increasing the role of the federal government in planning and funding intermodal projects in order to develop more integrated intermodal networks, either nationwide or along particularly congested corridors. This strategy could be similar to the strategy the federal government used in the 1950s to develop the interstate highway system. Under this strategy, Congress could establish national goals for the development of intermodal capacities that could include not only the development of facilities and connections, but also the development of a supporting transportation network to improve the ability of either passengers or freight companies to reach their final destination. The role of the federal government would change, with the federal government taking a more active role in setting priorities and planning of intermodal connections between the individual transportation modes. Similar to the development of the interstate highway system, the federal government's role could include providing project specific oversight, laying out routes, overseeing construction, and ensuring that the system is adequately maintained.

For the federal government to take a more active role in developing intermodal capabilities, it might also need to take on additional funding responsibilities. An example would be if a federal policy were established to develop a transportation system that promoted connections between airports and high-speed rail networks, as in Europe.¹⁴ To accomplish improved air-rail connections, the federal government would have to increase its funding role due to the high costs of enhancing or expanding rail service or developing high-speed rail corridors or tap others that would benefit from such service, including the region, its airport, and businesses associated with the airport as possible funding sources. The full costs of this policy would be dependent on how integrated and expansive such an intermodal network would be and whether it would include additional high-speed rail or be focused on conventional passenger rail service. We have shown in the past that both of these choices are

¹⁴In several cases, European national governments have established policies to reduce the number of short-haul flights at their major airports and have supported these policies by funding high-speed rail infrastructure.

costly and increased federal involvement could require the implementation of a dedicated funding source.

However, even if a revenue source is established, this new funding would face many of the same revenue challenges that other transportation systems, such as highways, are facing now as revenues sources are eroded. Additionally, given the high costs of this strategy, benefits high enough to justify investment in intermodal facilities would likely be anticipated in a limited number of places.

Concluding Observations

Increasing passenger travel and freight movement have led to growing congestion, and decision makers face the challenge of maintaining the nation's mobility while preventing congestion from overwhelming the transportation system. Successfully addressing mobility needs in the face of growing congestion requires both strategic and intermodal approaches. However, the current system for planning and financing transportation is not well-suited to advancing intermodal transportation projects—including both passenger and freight transportation—calling for fundamental changes that use a broader, systemwide approach to transportation investment decisions. A federal strategy of encouraging a more systemwide approach to transportation planning, including alternative funding mechanisms, could encourage transportation officials to consider the development of additional intermodal connections in the context of other transportation investment decisions. At the same time, it is clear that more quantitative evaluations of the costs and benefits of intermodal capabilities could help to better inform state and local, as well as federal decision makers, as they attempt to determine which projects to develop with their limited resources.

Mr. Chairman, and members of the Subcommittee, this concludes my prepared statement. I would be pleased to answer any questions you or other members of the Subcommittee might have.

GAO Contact and Staff Acknowledgments

For information on this testimony, please contact Katherine Siggerud at (202) 512-2834 or siggerudk@gao.gov. Individuals making key contributions to this testimony are Teresa Spisak and Tim Schindler.

Appendix I: Federal Programs That Can Fund Intermodal Projects at Airports

Program	Description	Example of use at airports
New Starts (FTA)	Selects worthy fixed guideway transit projects for funding by congressional appropriations. Projects can include heavy, light, and commuter rail and certain bus transit projects (such as bus rapid transit). To be eligible for funding, projects must, among other things, be justified based on a comprehensive review of mobility improvements, environmental benefits, cost effectiveness, and operating efficiencies, as well as being supported by an acceptable degree of local financial commitment. The program funding match is at most 80 percent federal and 20 percent local. ^a In fiscal year 2006, this program was funded at \$1.2 billion.	Bay Area Rapid Transit extension south of the San Francisco International Airport into San Mateo County New light rail system (Hiawatha Light Rail) providing service between downtown Minneapolis and the Mall of America, with two stations located at Minneapolis/St. Paul International Airport
Congestion Mitigation and Air Quality Improvement Program (joint FHWA and FTA)	Funds transportation projects and programs in order to reduce transportation-related emissions in localities with poor air quality. To be eligible for funding, projects must be transportation related, in nonattainment or maintenance areas, ^b and reduce transportation-related emissions. The program funding match is 80 percent federal and 20 percent local. In fiscal year 2006, this program was funded at \$1.7 billion.	Hiawatha Light Rail service between downtown Minneapolis and the Minneapolis/St. Paul International Airport
Surface Transportation Program (FHWA)	Provides funding to states and localities for projects on any federal-aid highway—including transit capital projects and local and nationwide bus terminals and facilities. The program funding match is 80 percent federal and 20 percent local. In fiscal year 2006, this program was funded at \$6.3 billion.	Miami Intermodal Center at the Miami International Airport
Transportation Infrastructure Finance and Innovation Act of 1998 (joint FHWA/FTA)	Provides federal credit assistance for surface transportation projects. Project sponsors may include public, private, state, or local entities. Projects eligible for federal assistance through existing surface transportation programs, including passenger bus and rail facilities, are eligible for credit assistance under this program. The amount of federal credit assistance may not exceed 33 percent of the reasonably anticipated project cost. In fiscal year 2006, this program was funded at \$130 million.	Miami Intermodal Center at the Miami International Airport
Airport Improvement Program (FAA)	Provides grants to airports for planning and development projects. The program is funded, in part, by aviation user excise taxes, which are deposited into the Airport and Airway Trust Fund. In terms of promoting intermodal capabilities, these funds may be used for access roads that are on airport property, airport owned, and exclusively serve airport traffic. The program funding match is 75 to 90 percent federal based on the number of enplanements ^c at the airport and the remainder is from local sources. In fiscal year 2006, this program was funded at \$3.5 billion.	We found no example of its use for intermodal projects.

Program	Description	Example of use at airports
Passenger facility charges (FAA)	Authorizes commercial service airports to charge passengers a boarding fee—commonly called a passenger facility charge—of up to \$4.50, after obtaining FAA approval. The fees are used by the airports to fund FAA-approved projects that enhance safety, security, or capacity; reduce noise; or increase air carrier competition. In calendar year 2005, \$2.4 billion in fees were collected under this program.	AirTrain automated people mover at New York’s John F. Kennedy International Airport and Newark’s Liberty International Airport Light rail extension and new station at Portland International Airport

Source: GAO analysis of DOT information.

^aWhen evaluating New Starts proposals, FTA places greater priority on projects that have a greater local matching share. Competitive New Starts proposals often have a 40-50 percent local match.

^bFederal air quality standards exist for certain common air pollutants (known as criteria pollutants). Geographic areas that have levels of a criteria pollutant above those allowed by the standards are called nonattainment areas. Areas that did not meet the standards for a criteria pollutant in the past but have reached attainment are known as maintenance areas.

^cAn enplanement is defined as a passenger boarding a flight. Enplanements include passengers boarding the first flight of their trip, as well as passengers who board after connecting from another flight.

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American Government and the Promotion of Economic Development
In the National Era, 1790 to 1860

John Joseph Wallis

University of Maryland

and

NBER

This paper was prepared for the conference on the "The Role of Government in U.S. Economic History", held in honor of Robert Higgs, Tucson, January, 2004.

I apologize for the length of the paper, but nothing extraneous was included except several extra figures and perhaps a table or two.

When Americans decided for independence in the spring of 1776 they faced many difficult decisions. They were declaring their independence as independent states. John Adams, leader of the Congress and later President of the United States, believed the real declaration of independence was made on May 6, 1776, when Congress asked the individual states to write their own constitutions.¹ But they also declared their independence together, as part of a nation. Once independence was declared, the balancing act of political genius was creating a national government strong enough to defend the country from external threats, while keeping the national government weak enough internally that it did not threaten the independence of the states. It took a long time to get the balance right. The first national constitution, the Articles of Confederation, created a national government just barely strong enough to secure independence, but not strong enough to pay off its debts, deal adequately with international affairs, or referee disputes between the states. The second constitution adopted in 1787 created a stronger national government. But that constitution left unsettled so many of the details about sharing power between national and state governments that internal debate over the proper “constitutional” powers of the national government brought the nation to the brink of disunity several times and finally to civil war in 1861. The biggest issue facing American government between 1790 and 1860 was internal, not external. How were Americans to govern themselves? How were power and policies to be shared between the national and state governments?

The division of responsibility between national and state governments was a source of constant debate between 1790 and 1860. Some functions of government were divided and some were shared between the two levels, and any history of government between 1790 and 1860 must take both levels into account. Our interest in explaining the structure of American government

as well as how government consciously or inadvertently promoted economic development. It begins by tracing in rough outlines the size and structure of government before the Civil War. After a sketch of the sources of growth in the American economy, it identifies the main policies of the national and state government, and what each level did to promote economic development.²

I. *Constitutions, the Division of Powers, and the Sharing of Powers:*

By 1780, every state but two heeded the call to write new constitutions. Connecticut and Rhode Island adopted their colonial charters as constitutions by substituting the state for the King. Every new constitution incorporated the idea of British mixed government – the King, the Lords, and the Commons – with bicameral legislatures and an independent executive. While all were democratic republics, the extent of democracy varied (all states had some wealth, property, or tax paying restrictions on voting and/or office holding), as did the internal relationships between the legislative bodies themselves and with the executive.³ Over the next fifty years most states adopted universal white male suffrage, streamlined their legislative machinery, and clarified the role and structure of the judiciary.⁴

The Articles of Confederation were proposed in 1777, but not ratified until 1781. Maryland ratified last, and only when New York agreed to cede its western land claims to the national government and other states agreed, in principle, to cede their claims as well.⁵ The Articles gave the Congress control over international relations and the military, but otherwise did not create a strong national government. States retained the sole power to levy taxes and the national government could only request funds from the states.⁶ While the Articles did not forbid national taxation, changes to the Articles required the consent of every state and Congress

viewed any attempt to impose a national tax as a change in the Articles.⁷ The unanimity provision protected each state individually from any national policy they did not like. But the unanimity clause meant that the new Congress of the United States – the Articles created neither an executive or judicial branch – was hamstrung from the very beginning.

The inability to levy national taxes meant that Congress was forever short of funds. Congress began by printing its own currency, but soon “continental dollars” were almost worthless. The United States was forced to borrow from domestic and international lenders to fight the revolutionary war. Victory did nothing to alleviate the government’s financial burdens. The national government defaulted (stopped paying annual interest) on most of its bonds after the war was over, although it promised to eventually to repay all of its debts. In 1781 and in 1783, Congress passed legislation asking the states to give permission for a national “impost,” a import tax, but first Rhode Island and then New York refused to give their assent. By 1785, the national government was bankrupt.⁸

The inability of the national government to raise revenue crippled its ability to provide national defense: the reason for its existence. Writing a new constitution giving the national government sufficient power to raise revenue to provide for external defense threatened internal liberties (see Robert McGuire’s essay in this volume). How could a national government with the power to tax be controlled? Article I, section I of the constitution provides that “All legislative powers herein granted shall be vested in a Congress of the United States,” and Article I, section II that “Representatives and direct Taxes shall be apportioned among the several States which may be included in this Union, according to their respective Numbers, which shall be determined by adding to the whole Number of Free persons, including those bound to Service for

a Term of Years, and excluding Indians not taxed, three fifths of all other persons.” Taxation was equated with representation.

The Constitution is a remarkably short document for all that it accomplishes. It is built around several checks and limits. First, it divides authority and decision making between the Legislative (Article I), Executive (Article II), and Judicial branches (Article III). Second, it enumerates national government powers in Section 8 of Article I and explicitly limits those powers in Article 1, section 9. The Tenth Amendment, “The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people,” in combination with the enumeration of powers places effective limits on the national government. Article 1, section 10 places explicit prohibitions on specific state government powers. But states retain an explicit the power to act as an external check on the national government through the ability of state governments to appoint Senators directly.

What powers are given solely to the national government, which are shared between state and national governments, and which reside solely with the states?

Powers given to solely to the national government (and conversely prohibited to the states) include:

- Regulation and conduct of international relations and international trade.
- Provision of national defense and the raising of an Army, although states are allowed to have militias.
- Power over the minting of coins, the printing of money, and regulation of the currency. States cannot “coin money; emit Bills of Credit; make anything but gold and silver coins a Tender in Payment of Debts” (Article 1, section 10).
- Regulate the movement of goods between states and internationally. The national government has the power to “Regulate Commerce with foreign nations, and among the several States, and with the Indian tribes.”(article I, section 8) States

are enjoined from imposing import or export duties without the consent of Congress.

National and state governments share the:

- Power to tax. With restrictions on the national governments ability to levy direct taxes (they can only be apportioned by population) and the national prohibition on export duties.
- Police powers. These are the use of the powers of government to “promote the general welfare.”
- All the powers of sovereignty associated with the common law powers of government in Britain This is implied rather than stated by the “necessary and proper” clause. So, for example, both national and state governments possessed the power to create corporations, without explicitly stating so in the national or state constitutions.

Finally, the national government was limited in its ability to

- Suspend the writ of Habeas Corpus, pass writs of attainder or ex post facto laws, pass laws giving preference to the citizens of one state over another, or create titles of nobility.
- Suspend any of the individual rights guaranteed in the Bill of Rights (the first Ten Amendments).
- These protections of individual liberties against government infringement would be extended to state governments under the 14th Amendment.

Given these constitutional mandates and restrictions, what did American governments actually do?

II. *The size and functions of American Government:*

No student of Bob Higgs would ever say the size of government is measured simply by the size of revenues, expenditures, or debt. Nonetheless, basic fiscal measures are a good place to begin describing what government did between 1790 and 1860 did. Several important functions of government were not reflected in the budget data and will be discussed later. Table

1 presents information on the size of government revenues by level of government for the 19th and 20th century. The 19th century numbers for local governments are rough estimates that begin only in 1840. The state numbers are also estimates based on fairly complete counts of state fiscal activity. The federal numbers are based on Treasury reports and are complete and accurate. The figures are decade averages (e.g., 1810 is the average of per capita revenues from 1806 to 1815). Per capita revenues are given in current dollars and as a percentage of per capita income.⁹

National government finances followed a distinct pattern driven by war finance. Figures 1 and 2 give national government expenditures and revenues annually in nominal dollars per capita from 1791 to 1936.¹⁰ The War of 1812, the Civil War, and World War I stand out in both figures. The national government paid for wars partly by raising taxes and partly by borrowing money. Figure 3 shows debt per capita and the deficit or surplus in the national budget. Debt measures the total amount of debt outstanding, while the deficit/surplus number measures the change in debt from year to year. These figures are also driven by war finance.

Where did the revenues come from? Figure 4 gives the share of total revenues from customs, land sales, and internal revenue. Internal revenue in the 19th century was primarily excise taxes on alcohol and other products, and after 1917 the income tax. There are three distinct federal revenue structures. The first, from 1790 to 1860 was dominated by customs revenues; the second, from 1860 to 1912, was a combination of customs revenues and internal revenues; and the third, post 1919, was dominated by internal revenues, specifically the income tax. Wars exert their effect on the structure of revenues. In the War of 1812, excise taxes were increased sharply, only to be eliminated after the war. In the Civil War new excise and income

taxes were imposed. The income taxes were removed after the war, but the excise taxes were not. Just before World War I the income tax was made constitutional and during that war sharply higher income taxes were collected.

On the expenditure side, Figure 5 gives the share of national expenditures going to the military and to interest payments on the national debt. As we've already discussed in regard to the constitution, the national government acquired a large debt in the revolution, and interest payments on the debt dominated national expenditures in the early years of the republic. Until the 1820s expenditures for the Army, Navy, and interest were usually 80 percent of national expenditures. During the War of 1812, the national debt increased, but it was quickly paid off. By 1835 the debt was zero, and interest payments fell accordingly. Up until the Civil War, defense expenditures average about half of federal expenditures. During the Civil War military expenditures peaked, and interest payments remained high for several decades after the war as debt was gradually paid off. The defense share fell to roughly 20 percent of national expenditures after the Civil War, but then rose again to about 40 percent during the Spanish American war and World War I.

Looking closely between 1790 and 1860 we see the same pattern: figures 6, 7, and 8 show national expenditures, revenues, and debts respectively. After 1790, the national government paid off the revolutionary war debt by running persistent budget surpluses and using the surpluses to retire debt.¹¹ The lion's share of revenues came from custom receipts. Between 1791 and 1860, the national government raised \$1,805,917,000 in revenues. Customs revenue of \$1,535,572,000 account for 85 percent of the total. Excise taxes were unpopular, in 1799? President Washington had to call out federal troops to suppress a protest of the whiskey excise in

western Pennsylvania.¹² Land sales rarely contributed significantly to federal revenues, except in years when land sales boomed, like 1835 and 1836. Tariffs ultimately became a divisive political issue in Congress, but at no time was the national government in a position to remove tariffs entirely or to raise them to prohibitive levels on most imports. There was no feasible or popular alternative to import duties in the early 19th century.

Expenditures totaled \$1,730,767,000, between 1790 and 1860, of which \$897,122,000 (52 percent) was for military defense and \$203,711,000 (12 percent) was for interest payments. The excess of total revenues over total expenditures reflects the repayment of \$85,000,000 in national debt. Of the remaining 36 percent of national expenditures, the largest portions went to running the government, what is often called general administration: the costs of running the executive, Congress, and federal courts. There were no large or significant expenditures for any other functions except the post office. Expenditures on transportation, including roads, rivers and harbors, and other improvements came to just \$54,000,000 between 1790 and 1860, only 3 percent of national expenditures.

Constructing measures of state government revenues and expenditures is more difficult because states varied widely in the way that they recorded revenues, expenditures, and debts and rarely kept track of everything they did in one report. The numbers in Table 1 give a rough measure of the relative size of state and national governments in the early 19th century. The per capita revenue numbers for state governments are constructed from the states for which Richard Sylla, John Legler, and I have collected information.

Aggregate averages conceal the wide variety in state taxes and spending. Figure 9 presents average annual per capita revenue from all (non-loan) revenue sources Indiana, New

Hampshire, Maryland, and South Carolina as well as per capita federal revenues.¹³ Collectively, as in Table 1, state revenues averaged about 20 to 25 percent of national revenues from 1800 to 1830. In the decade between 1835 and 1844, state revenues rose absolutely and as a percentage of national revenues, from less than \$.50 a person to \$.88 and to slightly over half of national revenues, and state revenues continued at a higher level through the 1850s. The rise in state government activity was caused by a boom in state investments in canals, banks, and railroads in the 1830s, and will be discussed in more detail in a following section.

There is considerable variation from year to year and from state to state. Figure 10 shows the per capita revenues of each state government in comparison to federal revenues. Panel 10A shows Maryland, where per capita revenues were between \$.30 and \$.50 per person up to the 1830s. In the late 1820s Maryland began borrowing money to invest in the Chesapeake and Ohio canal. In 1839, the state borrowed \$6,000,000 to save the canal. Total state debt reached \$15,000,000 in 1841. In 1842, Maryland defaulted on its state bonds, not resuming interest payments until 1848. Since the canal never made any money, the state eventually raised taxes to service its debts. As panel 10A shows, by the mid-1840s, per capita tax revenues were \$2.00 per person, four to six times higher than they had been in the 1820s and early 1830s, and equal to national taxes in those years.

Indiana and New Hampshire were both small rural states with very small state governments. Per capita revenues in both states ran about \$.10 to \$.20 per capita in the 1820s (the first year we have data for Indiana is 1825). In the mid-1830s, Indiana began construction on its ambitious canal and railroad network. At a time when the state population was about 500,000 people and the annual state budget about \$50,000, the state legislature authorized a bond

issue of \$10,000,000 in 5 percent bonds. Annual interest payments on the bonds came to \$1.00 per person, an ten-fold increase in size of the state government. Indiana thought, of course, that the canals and railroads would return a profit to the state. When they did not, Indiana, like Maryland, was forced to default on its bonds for a time, and to raise taxes to service its debts. In the 1840s and 1850s, per capita revenues in Indiana ranged between \$1.50 and \$2.00 per capita, again comparable to federal revenues. In contrast, New Hampshire, which did not borrow money to invest in canals, railroads, or banks, maintained low and steady revenues for the entire period up to 1860.

South Carolina presents another picture. The state was an early and active supporter of canals and banks. South Carolina borrowed in the 1810s to finance investments, and state revenues were always relatively high, between \$.40 and \$1.00 per person. South Carolina, however, did not participate in the 1830s investment boom. Like New Hampshire, per capita revenues stayed stable for the entire period up to the beginning of the Civil War.

Figure 10 takes the state and national revenues up to 1900 to illustrate a point that jumps out in each graph. National government revenues increased dramatically during the Civil War, remained high while the Civil War debt was retired, and never returned to their pre-war levels. State revenues rose during the war, but were never as high as national revenues. The structure of American government after the Civil War was dramatically different than it was before the Civil War.

What did states spend money on and where did they get their revenues from? In 1831, Hanna's *Financial History of Maryland* breaks down expenditures into the following categories:

Category	Expenditure 1831	Share 1831	Expenditure 1841	Share 1841
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Executive Department	\$10,378	5%	\$15,441	2%
Legislative Department	\$33,871	16%	\$67,369	8%
Judicial Department	\$36,785	17%	\$39,102	4%
Education	\$18,750	9%	\$18,500	2%
Charities	\$16,936	8%	\$19,987	2%
Penitentiary		0%	\$10,000	1%
Negro Colonization		0%	\$10,583	1%
Internal Improvements	\$21,311	10%	\$57,732	6%
Interest on Funded Debt	\$20,540	10%	\$566,322	63%
Sinking Fund	\$500	0%		0%
Miscellaneous	\$56,484	26%	\$89,456	10%
Total	\$215,555		\$894,492	

The year 1831 was typical of Maryland before the canal boom. Total expenditures were \$215,555. The number are representative of the general pattern of expenditures in many states: 40 percent for government administration, 10 percent for education, and 10 percent for charities (including asylums), in total a bit more than half of all state expenditures. Miscellaneous expenditures were roughly a quarter, and, of course, the content of these expenditures varied from year to year.

The main element in which states differed was the amount of expenditures devoted to “internal improvements” which in the early 19th century meant state expenditures on investments in or the construction and operation of roads, turnpikes, and canals, or investment in banks. South Carolina made early investments in transportation and banking. Virginia had a Board of Public Works in 1816. Pennsylvania was investing in turnpikes in the 1790s.¹⁴ The sharp increase in revenues in Indiana and Maryland in Figure 10 resulted from their needs to finance large canal investments in the mid-1830s. Hanna’s figure for 1841 show expenditures were \$894,492. Work on the canal had almost ceased, but expenditures on interest alone reached \$566,322. The internal improvement boom of the 1830s was critically important for states, and we will consider it in more detail in a later section.

States differed more widely on the revenue side. Revenues came from four general sources: property taxes, poll taxes, taxes on businesses, and asset income. Property taxes were levied on land and other wealth. Property taxes were sometimes levied on a per acre basis, but more commonly they were levied *ad valorem*, that is, on the assessed value of the land and other wealth subject to taxation. Poll taxes were head taxes imposed on voters. Business taxes encompassed a wide variety of fees, licenses, permits, bonuses for corporate charters, and taxes on capital. Asset income was income earned directly as dividends on state investments in corporations, or as tolls on state transportation projects.

Tables 2 and 3 provide information on the importance, or lack of importance, of property taxation in state revenues. Table 2 looks at eleven states from 1800 to the mid-1820s. The table shows the increase in state expenditures during the War of 1812, the middle column 1813 to 1817, and the share of expenditures financed by property taxes. The last rows of the table give simple averages, population weighted averages, and weighted averages excluding Ohio and Delaware, which were outliers with respect to property taxes. The Ohio case is particularly interesting, as it is the only “western” state in this table. Ohio became a state in 1803 and immediately began taxing land. Property taxes initially account for 100 percent of Ohio revenues. Property taxes in most states rose during the War of 1812, absolutely and as a share of total revenues, as states were forced to defend themselves from British troops (the federal government was unable to defend states adequately). States always possessed the ability to tax land, and in emergencies fell back on property taxation as a revenue source.

States preferred, however, to eliminate the property tax if possible. Table 3 gives per capita property tax revenues, property tax shares of total revenues, and per capita total non-loan

revenues for a selection of states between 1835 to 1841 and 1842 to 1851. The upper panel of the table lists states that did not depend on the property tax before 1841. Indeed, many states had eliminated the state property tax (not the local property tax) completely before 1830. These states were well established eastern states with substantial amounts of business taxes and asset income. The weighted average property tax share in these states was only 2 percent between 1835 and 1841. States in the second panel were established states in New England that continued to rely on the property tax, a weighted average property tax share of 58 percent. States in the third panel are from the west. These were also states that relied heavily on the property tax, a weighted average of 43 percent of total revenue.

The revenue figures are divided into pre- and post-1842 to demonstrate the effect that the collapse of the canal boom had on the source of state financing. Maryland, Pennsylvania, Illinois, Michigan, Indiana, Florida, Mississippi, Louisiana, and Arkansas all defaulted on their debts in 1841 and 1842. Just as in the War of 1812, states faced a fiscal crisis and fell back on their property taxes. Property taxes rose from \$.03 to \$.87 per capita in Maryland, from \$.02 to \$.53 in Pennsylvania, from \$.01 to \$.14 in New York, from \$.14 to \$.22 in Indiana, \$.21 to \$.52 in Ohio, and \$.23 to \$.34 in Indiana. These represented substantial increases in property tax rates and overall increases in taxation. In each of these states higher taxes were driven by the need to service debts incurred in the 1830s canal boom.

The distinct regional differences in tables 2 and 3 reflected the ability of eastern states (with exceptions in New England) to tax businesses and to acquire ownership in private enterprises. Massachusetts, New York, Pennsylvania, Maryland, Virginia, South Carolina, Georgia, and Alabama all held significant amount of bank stock at some time before 1830.

Massachusetts, Connecticut, and Rhode Island taxed bank capital. The bank capital tax made up over 50 percent of Massachusetts revenues in the 1830. In the 1820s and 1830s taxes on bank capital or charter fees were over 25 percent of revenues in Connecticut, Delaware, Pennsylvania, and North Carolina. Dividends from their bank investments allowed Georgia and Alabama to eliminate their state property taxes in the 1830s.¹⁵ Eastern states also levied an array of taxes on corporate capital, business licenses, and fees of all types.

Western states simply didn't have the businesses to tax and were forced to rely on property and poll taxes. Indiana's 1835 revenues of \$50,000 came half from poll taxes and half from property taxes. Western states had land and people, and that is what they taxed.

III. Economic growth and government promotion of economic development

The United States was an agrarian society in 1783. Three quarters of the labor force was engaged directly in farming and a large share of the other quarter worked in processing, packing, shipping, or selling farm products. Perhaps ten percent of the labor force was employed in manufacturing. Agriculture and manufacturing were the two primary sources of economic growth in the early 19th century. Growth in both sectors were related to the growth of the domestic economy within the United States, but what each required from governments in terms of legal and financial support were very different.

The single most important resource Americans possessed through the entire period up to the Civil War was land: more wealth was held in the form of land than in any other form. The peace settlement with Britain gave the new country extensive holdings of western land from the Appalachians to the Mississippi, millions of acres of land the federal government wanted to sell to private individuals. Opening the west to settlement and cultivation was the biggest potential

source of economic growth and the nation's number one economic priority. But the process wasn't cheap. There were two elements to the cost. One borne directly by the farmers, the other fell on the larger society.

Land is usually not treated as part of the capital stock, since land possesses certain features like location that are not the result of investment and savings, but improvements to land are definitely capital investments. Raw land, covered with trees or prairie grasses, could not be brought into production without a substantial investment in land clearing, fence building, and farm building. The land itself was cheap, but making a farm was expensive. In 1860, the state of Minnesota estimated that a 160 acre farm cost \$775 to establish, and only \$200 of that cost was for the land itself. The cost of building farms fell on individuals. Robert Gallman's estimates of the capital stock in the early 19th century show that improvements to land were the single largest element in investment before 1840.¹⁶

Fertility and location determined the value of land. Western lands were inherently productive, but in the wrong place. The cost of transporting bulk agricultural products over the Appalachian mountains in 1800 exceeded the value of the product. Land prices throughout the country varied in proportion to the distance of the land from viable transportation. Land along the Atlantic and Gulf seaboards and the navigable inland waterways running to the ocean, was much more valuable than land in the interior. Farming in the northwest depended on building a national transportation system linking the Ohio and Mississippi River valleys with the eastern seaboard. The costs of building such a system far exceeded the financial abilities of individual farmers. Many private firms came forward in the 1780s and 1790s and asked states for charters to build canals into the west: companies like the Schuylkill & Susquehanna Navigation company

in Pennsylvania, the Western and Northern Inland Lock Navigation company in New York, or the Potomac Company in Virginia. These companies all tried and failed to breach the Appalachian mountains. In the end, state governments took the lead in successfully building a national transportation network

Farm building and transportation investment were two of the three elements necessary to bring all the nation's farmers into a national market. The third element was a financial system capable of providing short term credits to farmers, shippers, and wholesalers who moved the crops from farms to urban and international markets. A farmer in Ohio faced the problem of selling his crop in the east. One possibility was to sell his wheat in Cincinnati to someone who would arrange to transport it to New York and sell it there. Another possibility was to arrange shipment with a freight line, ship his crop to an agent in New York, and have the agent sell it and send the profits back to him (net of the agent's costs). The difference in these two methods was the ownership of the wheat. If the farmer sells in Cincinnati, the shipper owns the wheat and bears the risk of any rise or fall in the price. If the farmer consigns his crop to an agent, the farmer bears the risk of any change in the price. The most common method in the 19th century was for the farmer to consign his crop and bear the risk of price fluctuations.

The farmer, as a result, did not get paid in cash for his crop in Cincinnati. Instead, the agent to whom he consigned his crop typically authorized the farmer to draw a "bill of exchange" on the agent's representative in New York. This bill was like a check, which the farmer wrote in Ohio, honored by the agent's representative in New York in the future.¹⁷ Since no one in Ohio wanted to be paid with a check drawn on an individual in New York, the farmer usually took the bill to the local bank (if there was one) and sold it to the bank for cash. The

bank paid the farmer less than the face value of the bill and then arranged to collect the amount due in New York in the future. The bank's profits came from the difference between what they paid to the farmer and the face value they received when the bill matured. The "discount" between the two prices represented the interest on the loan made to the farmer. Since the farmer wrote the bill in the first place, the farmer was ultimately responsible for honoring the bill if the New York agent did not pay the bill. Sound complicated? It was, but it was the cheapest way of doing business over a long distance when communications and transportation were expensive and took a long time.

Table 4 examines the difference in the price of a barrel of flour in Cincinnati and New York/Philadelphia between 1816 and 1860 to give a rough idea of the importance of declines in transportation and financial costs over the early 19th century. In 1820 a barrel of flour (weighing 196 pounds) cost about \$8 in New York and \$5.52 in Cincinnati, in 1860 the price was about \$5 in New York and \$4.72 in Cincinnati.¹⁸ Over time, the difference in prices between the two markets fell from \$2.48 a barrel to \$.28 a barrel, a decline of almost 90 percent (the lower panel of the table). The bulk of the decline was in transportation costs. In the early 1830s, Ohio completed two canals that linked up southern Ohio with Lake Erie, and via the lake with the Erie Canal and New York city. Transportation costs fell to \$1.05 a barrel in 1836-1840, the first full five year period after the canals were in operation. The next major drop in the price differential occurred at the very end of the period, when the difference dropped to \$.28 a barrel in 1855-1860, after the railroad (the Baltimore and Ohio was the first) reached across the Appalachians in the early 1850s.

The importance of financial services is approximated by the interest costs on a 90 day

loan to finance the shipment of flour east. The table uses two ballpark interest rates, 24 percent in 1820 and 8 percent in 1860. The interest costs of \$.33 a barrel comprised 6 percent of the Cincinnati price in 1820, and costs of \$.09 percent were only 2 percent of the Cincinnati price in 1860. On the other hand, interest costs were only 13 percent of the price differential in 1820, while they were 33 percent of the price differential in 1860. As the physical cost of transporting goods dropped, financial costs became a more important wedge between producer and consumer prices.

Interest costs were only part of the “transaction costs” of getting goods to market. Freight handling, insurance, and warehousing were all part of transaction costs. The figures give some idea of their importance as well. Once the Ohio canals were open, tolls steadily declined as both New York and Ohio tried to keep as much freight as possible moving over their canals.¹⁹ Despite lower canal tolls, the price difference between Cincinnati and New York widened in the 1840s and fluctuated over time. The rise in the price differential from \$1.02 in the 1836-1840 period to \$1.68 in the 1846-1850 period must have been the result of higher cost of transaction services, not higher in transportation costs. Financial services were a substantial part of the cost of getting goods to market, and banks played a central role in reducing the transaction costs of getting goods to market.

There were several important advantages to establishing local banks in western and southern state outside the commercially developed northeast. First, banks printed their own money in the form of bank notes, redeemable in gold, that circulated in the local economy.²⁰ Keeping with the numbers in the previous example, suppose that money could be borrowed in the form of gold coins (specie) in Indiana at an interest rate of 24 percent. A bank that printed

\$3 in bank notes for every \$1 in gold coins it held in its vaults could discount three times as many bills of exchange in bank notes as it could in gold. The bank could break even if it discounted the bills of exchange for 8 percent, that is, its return on the gold it held would be 24 percent. By creating banks, western states could provide liquidity to their local markets, in the form of bank notes, at much lower cost than the same amount of money in gold coins. Second, the establishment of local banks created local information about credit worthiness of local borrowers. A banker in Indianapolis could better judge the credit risk of his neighbors than a banker in New York. Once the Indianapolis banker established his credit worthiness in New York, he could borrow money in New York to lend in Indianapolis to his profit and to the benefit of his neighbors. Finally, the establishment of local banks and currency provided local markets with some independence from fluctuations in the bank notes of other cities. It is not surprising, then, that every state wanted to encourage the establishment of banks within their boundaries. In southwestern states with access to ocean transport, the states invested heavily in banks, but almost nothing in transportation.

Bringing the west into the national market required improvements in transportation and in financial services. The major beneficiaries of the improvements were farmers in the west who shipped bulky, low value agricultural products to the east and on to international markets. But the investment in the transportation/financial system directly stimulated the growth of manufacturing in the north east. During colonial times Americans imported many of their manufactured goods from Britain, a pattern that withstood the stress of the revolution. American markets for higher quality manufactured goods – hats, clothes, textiles, cutlery, crockery, books, etc – were dominated by British firms. The Embargo and the War of 1812 gave American

producers a brief window of protection from British competitors, and there was a surge in the formation of American manufacturing firms and an increase in domestic output. With the resumption of normal relations after the war, British goods flooded back into American markets. American producers could compete with Britain in two ways. The first was protective tariffs, a sole responsibility of the national government under the constitution. The second was the production of cheap, lower quality goods naturally protected by the high transportation costs of shipping goods across the Atlantic.

Because of their higher value and lower weight, manufactured goods always travel well, that is they can be profitably shipped farther than most agricultural products. Opening up the internal domestic market in the United States by reducing transportation and financing costs offered northeastern manufacturers a growing market in cheap, durable, easily repaired or replaced manufactured goods. While agriculture was geographically extensive, expanding output in manufacturing was geographically intensive. Producers bunched together in small geographic areas where costs were lower because of a price advantage (cheap labor or water power) or because of knowledge was more readily available (a key in the new manufacturing technologies), and then distributed their products over a wider area. This geographically intense pattern was made possible by a more efficient distribution system. American manufactures in the early 19th century were not producing for international export (this would change in the later part of the century), but for domestic export.

Manufacturing concentrated in the northeast. Agriculture spread through the rest of the country, grain and meat production in the north, cotton production in the south. Economic growth built on advances in transportation and finance. Promotion of economic growth required

investments in banks and canals, later railroads. Whether governments promoted economic development depended on government's ability to stimulate development of transportation and financial systems.

IV. The federal government and promotion of economic development

We have already learned that import tariffs were the major source of federal revenue and that military defense and the interest payments on war debts were the major source of federal expenditures. But not everything a government does is reflected in large revenues or expenditures. Indeed, one of the most important government contributions to economic growth is to provide a stable and unbiased legal environment. The costs of running the judicial system are, in a way, unrelated to whether the government provides effective justice, since corrupt courts might require more expenditures than just courts. This section examines the activities of the national government to see which may have had an impact on economic growth regardless of their size in the budget.

The federal government provided military defense, conducted international relations, ran the postal system, and administered the federal courts. All important functions. Occasionally major debates arose over the conduct of federal policy, but there was never any serious question that the government would cease providing these services. On the other hand, Congress regularly debated import tariffs, support for internal improvements (transportation), public land policy, the existence of a federally chartered bank, and the continued existence of and regulation of slavery. The previous section identified why tariffs, transportation, western land, and banking were important determinants of economic growth in the early 19th century. Slavery was very much an economic issue. The major issues facing Congress, the President, and the federal courts

in the early 19th century were how much, if anything, the federal government should do to promote economic development through active policy in these areas.

The Constitution of 1787 explicitly assigned responsibility for tariffs, public lands, and banking to the federal government, and there was never any question that the federal government could build transportation projects and regulate slavery (at least in the territories). This doesn't mean that individuals, including several presidents, didn't argue that a federal bank was unconstitutional, or that the federal government couldn't build a road or a canal without a constitutional amendment, or that the federal government had no power over slavery. It does mean that the federal government was never prohibited from establishing a bank, controlling the emission of money, building a road or a canal, regulating slavery, levying a tariff, fighting a war, or controlling the settlement of western lands because those actions were somehow declared unconstitutional. People, politicians, and presidents sometimes argued that one of these policies was unconstitutional, but that was a political argument, not a constitutional one.²¹

Yet, if the federal government had the constitutional power to promote economic development in these ways, did it use those powers? The question is a subtle one. The federal government did not have the option of not having a policy. For example, giving the federal lands away for free is just as much a policy as not selling any. The questions are not whether the federal government had a policy, but 1) whether the policy it did have was intended to promote growth, 2) how, over this seventy year period, did the policy change, and 3) were the changes intended to increase or decrease federal government promotion of economic development? It appears that the federal policies put in place by 1792 were intended to promote economic development, but after 1792 the federal government found it extremely difficult to expand

promotion of economic development farther than the *status quo*.

The easiest policy to quantify and understand is transportation or, in the words of the time, internal improvements. There had always been a strong argument for federal support of transportation projects. George Washington had been an early organizer and supporter of the Potomac Company, which aimed to build a canal from the Chesapeake Bay into the Ohio river valley. Even Thomas Jefferson, later an opponent of federal support for internal improvements, said in his second Inaugural speech in 1805: “the revenue thereby liberated [from paying off the national debt] may, by a just repartition among the states, and corresponding amendment of the constitution, be applied, *in time of peace*, to rivers, canals, roads, arts, manufactures, education, and other great objects within each state.”²² Jefferson mentions a constitutional amendment, one allowing the federal government to make transportation expenditures. This implies Jefferson’s belief that such a policy would be “unconstitutional” without an amendment. An interesting position, since Jefferson himself had signed into law the enabling act for Ohio in 1803 which required the federal government to spend 2 percent of the land sales revenues of public land in Ohio on transportation improvements leading to or in Ohio. Congress and Jefferson had already decided it was constitutional for the federal government to support and build roads.

Between 1790 and 1860 the federal government spent a total of \$54 million on transportation improvements. Table 5 presents Malone’s tabulations of federal expenditures by type and time. By far the largest share of federal expenditures went to rivers, harbors, and aids to navigation, all explicitly allowed in the constitution. The single largest project was the National Road, which grew out of the promise made to Ohio to spend a portion of the revenues derived from land sales on roads. But of \$9 million on roads, plenty went to short roads built

within one state. When Andrew Jackson vetoed the appropriation for the Maysville Road in 1830 on the “constitutional” grounds that it lay entirely in Kentucky (and was the route home for his arch political rival Henry Clay), he conveniently ignored the precedent of many similar grants that had already been made.

How important were federal transportation expenditures? State and local governments spent over \$450 million on transportation projects, nine times federal expenditures. Most of the federal spending went to small rivers and harbor improvements and light houses, only a few were projects like the National Road. Why did the federal government accomplish so little? The main reason can be found in the kind of projects they did fund. “Rivers and Harbors” bills contained lots of small projects for congressional districts scattered around the country. No section, east, west, north, or south was willing to support a large appropriation that would go exclusively to one region. The Bonus Bill vetoed by Madison in 1817 would have taken the \$2 million bonus (charter fee) paid to the federal government by the Second Bank of the United States and divided it among the states on the basis on Congressional representation -- the share distributed to each state was equal to its share in the total number of Senators and Representatives.²³ Henry Clay and John Calhoun, the bill’s sponsors, wanted to create a fund to spend the money on projects in any state, but Congressional opponents would not support the bill until it was clear that every state would get some money (even then the bill passed by just a few votes).²⁴ Three more times, in 1832, 1836, and 1841 Clay was able to get a “distribution” bill that allocated federal land sale revenues among the states on the basis of Congressional representation. But these bills amounted to very little; every state got a small amount and the federal government put no projects in place.²⁵

The public lands were always closely related to internal improvements. Land values rose when transportation improvements were made. The federal government adopted a system of public land sales in 1785 and 1787, before the Constitutional convention, that was designed to maximize revenues from land sales (see Gary Libecap's paper in this volume). Land sales were rarely an important source of federal revenue. Only in land booms, as in 1818, 1836, and 1854, did land sales approach 20 percent of federal revenues, and in most years were well below 10 percent. The original system offered land for sale in open auctions, in minimum size parcels of 640 acres at a minimum price of \$2.00 an acre, with the option of buying land on credit. There were no limits on the maximum size purchase. Between 1785 and 1841, a series of acts gradually lowered the minimum size purchase, from 320, to 160, to 80 acres. The minimum price was lowered to \$1.25. Credit sales were abolished in 1820 when it became clear that most of the people who bought on credit did not pay up. Preemption -- occupying land without title -- was illegal but widespread throughout the west. Dislodging farmers who had built farms on preempted land was politically unpopular, and after a series of preemption acts that recognized the rights of preemptors to buy land at the minimum price, the federal government finally gave up and made preemption permanent in 1841.²⁶ At that point the federal government accepted that revenues from land sales would never amount to much.

What did these changes in land policy mean for economic development? Almost nothing. Land policy itself was very important, but the shape of land policy was in place by 1787 and the changes after that date were minor. Smaller minimum purchase sizes had some effect, but individuals could still purchase larger parcels. Preemption was not a significant change, since the government had rarely been willing to evict occupants without clear title, and had set a

definite precedent of negotiation. Feller concluded his history of federal land policy between 1790 and 1841 this way: “Considering its central place in the Jacksonian debate over political economy, federal land policy did not change much during those years.”²⁷

The fact that little was done in the area of land policy and internal improvements does not mean that nothing was proposed or discussed. Appendix I gives major land and internal improvement legislation that came before Congress between 1790 and 1840. The table lists 48 pieces of legislation, although not all were passed. There were bills to give the public lands to the western states, bills to give the revenues to states for education, and bills to distribute land revenues to support internal improvement. As with internal improvements, there was a continual conflict between western states with public lands within their borders and wealthy eastern states with no public land but a desire to see federal land revenues shared.

Slavery was the third area of federal responsibility (shared with the states) where much was debated and little was changed. The focal debate over slavery in Congress involved the process of creating territorial governments in the west from which new states would form. If a territory was allowed slavery then the territory was likely to allow slavery when it became a state. If slavery was prohibited in a territory, it the territory was likely to prohibit slavery when it became a state. Debates over slavery were inextricably linked to land policy, established in the land ordinances of 1785 and 1787. The 1787 “Northwest Ordinance” governed settlement in what would become the states of Ohio, Indiana, Illinois, Michigan, and Wisconsin. Article VI of the ordinance stated “There shall be neither slavery nor involuntary servitude in the said territory, otherwise than in the punishment of crimes,... *Provided always*, That any person escaping into the same, from whom labor or service is lawfully claimed in any one of the

original States, such fugitive may be lawfully reclaimed, and conveyed to the person claiming his or her service as aforesaid.”²⁸ Because the Ordinance preceded the federal constitution, there was no room for debate about slavery in the northwest, nor was there any doubt that the federal government was committed to enforcing fugitive slave laws.

Kentucky was created in 1791 out of the state of Virginia, so federal public land law never applied there. North Carolina ceded Tennessee to the federal government in 1790. The terms of the cession allowed all existing private claims to be honored, and most of Tennessee had been sold or granted to private individuals. The cession required that Congress “assume the government of the said ceded territory, which they shall execute in a manner similar to that which they support in the territory west [sic] of the Ohio; ... *Provided always*, That no regulation be made or to be made by Congress shall tend to emancipate slaves.”²⁹ In 1798, Congress created the Mississippi Territory, encompassing the land that would become Alabama and Mississippi, stating that “the President of the United States is hereby authorized to establish therein a government in all respects similar to that now exercised in the territory northwest of the Ohio, excepting and excluding the last article of the ordinance made for the governance thereof by the late Congress, on the thirteenth day of July, one thousand seven hundred and eighty-seven.”³⁰ The last article of the Northwest Ordinance was Article VI, prohibiting slavery. Land and slavery in Kentucky and Tennessee were set aside from federal control by the Virginia and North Carolina grants. In the northern arm of western settlement slavery was prohibited, in the southern arm of western settlement slavery was allowed.

The first big crisis came when Missouri petitioned for admission as state in 1820. Missouri was the second state created out of the Louisiana purchase, Louisiana was the first in

1811. The terms of the Louisiana and Orleans Territorial Act, 1804, prohibited importation of slaves into the territory from outside the United States, prohibited the importation of slaves into the territory from the United States if they had been imported into the United States after 1798, but allowed the importation of slaves into the territory from other states in the Union as long as it was done “by a citizen of the United States removing into said Territory for actual settlement, and being at the time of such removal *bona-fide* owner of such slave or slaves.”³¹ It was legal to bring slaves into Missouri and people did. The question raised in 1820 was whether slavery would be allowed in the remainder of the Louisiana Purchase. The Missouri Compromise, engineered by Henry Clay, brought Missouri into the Union as a slave state, brought Maine into the Union as a free state (Maine was originally part of Massachusetts), and prohibited slavery “in all that territory ceded by France to the United States, under the name of Louisiana, which lies north of thirty-six degrees and thirty minutes north latitude, not included within the limits of the state contemplated by this act.”³²

The Missouri compromise acknowledged the “balance rule,” that slave and free states should have equal numbers in the Senate. The compromise governed settlement in Minnesota and Iowa (free) and Arkansas (slave), and put off until the 1840s the question of what would be done with land further to the west. The recognition, then annexation and admission of Texas as a slave state in 1845 created another intense debate between the south and north, which escalated with the Mexican American war. Ultimately another round of compromise was reached in 1850, the last of the famous compromises arranged by Henry Clay, in which California was admitted as a free state to balance Texas. In the 1850s the status of the Kansas-Nebraska territory sparked a crisis that could not be resolved by compromise, and led the nation into war.

Did federal policy regarding slavery change at all through these crises? The answer, as with public lands and internal improvements, has to be no. The federal government decided to draw the line for slave and free territories in 1820, beyond that it debated, argued, and finally broke up, with exactly the same policy put into place in 1787.

In three other major areas of federal responsibility - import tariffs, banking, and defense/international affairs -- the federal government did take action. In all three areas the Constitution gave sole responsibility to the national government. Federal tariff and financial policies were intertwined from the beginning by Alexander Hamilton's proposal for funding the revolutionary war debt, putting the government on a sound financial footing, and promoting the development of American trade and manufacturing. Hamilton's plan refunded most of the existing federal and state debt from the revolution, that is, new bonds were created and traded for existing bonds. A national bank, which issued its own currency, was created to act as the federal government's financial agent, where federal tax receipts would be deposited and where checks were drawn for expenditures (including payments on the national debt). Finally a set of import tariffs were imposed, both to generate revenues and to protect manufacturing.³³

All three elements of the plan were passed by Congress and signed by President Washington, despite intense debate and opposition. Attorney General Randolph and Secretary of State Jefferson thought the Bank was unconstitutional. Their arguments turned on the power of the government to create a corporation, a power the Constitution had not explicitly enumerated and, therefore under the reserved powers clause, a power possessed by states but not the national government. Hamilton argued, successfully, that the power to create a corporation was inherent in the powers of a sovereign government:

The latter [Randolph], expressly admits, that if there is anything in the bill which is not warranted by the Constitution, it is the clause of incorporation.

Now it appears to the Secretary of the Treasury [Hamilton] that this *general principle* is *inherent* in the very *definition* of government, and *essential* to every step of the progress to be made by that of the United States, namely: That every power vested in a government is in its nature *sovereign*, and includes by *force* of the *term*, a right to employ all the *means* requisite and fairly applicable to the attainment of the *ends* of such power, and which are not precluded by restrictions and exceptions specified in the Constitution, or not immoral, or not contrary to the *essential ends* of political society.³⁴

Hamilton's Constitution contained an implicit and inherent grant of power to the federal government sufficient to perform the functions it was assigned in the Constitution. There was no doubt the federal government was given the power to regulate the emission of "bills of credit," that a common form of bills of credit were bank notes, and that banks typically required corporate charters in order to operate. But you can see how Hamilton's reading of the Constitution differed from Jefferson. Hamilton saw limits on the federal government in the Constitution only where there were explicit restrictions, where Jefferson saw powers given to the federal government only where there were explicit grants. The two positions remain poles of argument today.

The federal government did charter the Bank of the United States (BUS) in 1792. The bank had branches throughout the country, issued its own bank notes, served as a depository for federal tax receipts (mostly customs as we have seen), and moved federal funds around the country through its branch system as needed to meet federal needs. Revenues were collected primarily in seaports in the northeast and New Orleans, while the bulk of expenditures was for military defense, much of it on the frontiers. The BUS enabled the government to perform these functions efficiently and at low cost. The BUS was a private corporation whose stock was owned, in part, by the federal government.

Congress failed to renew the BUS charter when it expired in 1812 and federal government financing of the War of 1812 suffered as a result. In 1816, Congress passed a bill chartering a new Bank of the United States (known as the Second BUS). President Madison signed the bill chartering the bank despite his history of constitutional concerns, acknowledging that experience had proven the bank useful and constitutional. Both the First and Second banks provided an important link in the development of a nationally integrated financial system. The bank notes of the branches of the BUS were accepted at par (face value) at all branches of the system, providing the country with a uniform paper currency. The notes of state chartered banks tended to trade at a discount that increased with the distance of the note from its issuing bank. As important, the BUS facilitated the movement of payments between the regions of the country in the process of carrying out its role as the agent of the federal government. The BUS bought bills of exchange in different regions and delivered them for payment at their maturity. Because the BUS was involved in every region of the country, it could turn a tidy profit on the business at the same time that it provided a more orderly market for these critically important financial instruments.

The charter of the Second BUS expired in 1836. When Congress renewed the charter in 1832, the renewal was vetoed by President Jackson. Although Jackson attacked the bank on constitutional grounds, the force of his argument lay on privileges exercised by the bank. These extensive privileges and profits, some of which went to foreign stockholders, made the bank a “monster of corruption.” There would not be a national bank again until 1914, although the federal government would resume chartering banks in 1863 under the National Banking Act (see Richard Sylla’s essay). The federal government did try to promote economic development by

chartering a national bank, Hamilton laid out the rational and drew up the blueprints in 1790. But a national bank always generated lots of political opposition, and the federal government was unable to sustain the national bank in 1812 and again in 1832.

Tariffs were different, if only because the government relied on them for 85 percent of its revenues before 1860. Hamilton proposed moderate tariffs. He wanted an import tariff both to raise revenues and to promote manufacturing development. Tariffs that were too high provided protection, but no revenue. Tariffs that were too low provided neither revenues nor protection. Hamilton's proposed tariffs were generally implemented by Congress in the 1790s.³⁵ Measuring tariff rates is complicated by several factors. Tariffs can be imposed on units, weight, or value; and tariffs vary from product to product. So the overall burden of tariffs depends on how the tariffs are imposed and what goods they are imposed on.

Figure 11 gives tariffs as a share of dutiable value of imports (that is the official value on which the tariffs were levied) from 1821 to 1955. Tariffs rates rose from the 1790s to the 1820s. There was pressure to increase tariffs from manufacturing interests in the northeast and pressure to reduce tariffs from the cotton exporters in the south. Pressure for tariffs peaked with the "tariff of abominations" enacted in 1828. Tariff rates as a share of dutiable value were highest in 1831, 61 percent. Exporting interests always opposed high tariffs, but the tariff of abominations brought extraordinary opposition from the south. In 1832, South Carolina "nullified" the tariff, refusing to allow it to be collected with its borders. President Jackson threatened South Carolina with military occupation if they did not back down, vehemently denying any state's ability to nullify a federal act.³⁶ Again, Henry Clay arranged a compromise in 1832 that allowed South Carolina to rescind nullification without an invasion of federal troops, but in the "Force Act"

gave the President the authority to use force should it be necessary, and promised to reduce tariff rates by 10 percent per year for the next ten years. Clay's compromise ended the nullification crisis, but it also signaled the end of the protective tariff as an active policy tool to promote development. Tariff rates declined steadily from 1832 to 1860.

The federal government started out the 1790s with the power and the tools to promote economic development through banks and tariffs. Wielding those powers, however, was politically controversial. By 1832 and the ascendance of the Jacksonian Democrats, the federal government backed away from both a national bank and a protective tariff. Only in the third area of undisputed federal policy, did the federal government continue to forge an active policy.

We have already seen the importance of land to the early 19th century American economy. Between 1790 and 1867, the land area of the United States almost quadrupled. The nation occupied 525 million acres after the Revolution. The Louisiana Purchase in 1803 added 523 million acres, the annexation of Texas in 1845 added 247 million acres, the Oregon Compromise with Britain in 1846 added 180 million acres, the Treaty of Guadalupe Hidalgo that ended the Mexican American war added 334 million acres, and the purchase of Alaska in 1867 added 365 million acres.³⁷ This dramatic expansion into the west was the fruit of diplomatic negotiation and war. Not all of attempts to increase the size of the United States were successful, the War of 1812 began with an failed invasion of Canada. We have already seen with slavery that the movement into western lands always involved internal debate about how land should be acquired and who should settle it. But from its inception, the federal government carried out an active program of expanding the country, and, through Army expenditures on the frontier (the single largest item in the federal budget) provided security and government along

the western expanse.

In 1790, the federal government possessed the constitutional powers to promote economic development through public land policy, internal improvement investments, banking and financial investment, tariffs, and international expansion. Federal land and slavery policies hardly changed at all from 1790 to 1860, and the federal governments efforts in the field of transportation were negligible, less than a ninth of state and local investment. Hamilton's blueprint for economic development included federal action in banking and a protective tariff, both of which were enacted, but by 1832 those policies had been eclipsed by political opposition. Only the drive to add more land continued unabated from 1790 to 1860, but the development of the new lands in the west, and their connection with established areas in the east, both through transportation and financial systems, would depend on actions taken by state governments.

V. State Governments and the Promotion of Economic Development

It is easy to see why historians focus on the federal government. States did nothing so exciting as making war on the British, the Mexicans, or the Indians; did not decide the fate of any manufacturing interests by setting tariffs; did not distribute hundreds of millions of acres of public land; and did not decide whether or not there would be a national bank. Successful state politicians aspired to be Senators, no Senator aspired to be a Governor. The federal constitution prohibited states from declaring war, conducting international relations, regulating the currency or emitting bills of credit, levying a tariff or otherwise effecting international trade or even domestic trade across state lines. The federal government was the only government involved in the expanding the nation's boundaries in the west. How could states possibly influence the pace and pattern of economic growth in the early 19th century?

The process of opening the west required enormous resources and turned the economic focus and energies of the country inward. In comparison to the colonial economy, which revolved around international exports and imports, the 19th century economy became increasingly independent of foreign markets. The major economic opportunities were within the United States, not outside of it, and the most important, and potentially profitable, investments were in transportation and finance. The role of states in finance and transportation far outstrips the federal government in importance. Despite constitutional restrictions on regulating the currency and emitting bills of credit, the financial system that arose between 1790 and 1860 was based on banks not only chartered by state governments, but in some cases owned by state governments. Nine out of every ten dollars spent on public transportation investment came from state and local governments. By 1860, portions of transportation system, particularly in the east, were passing out of the hands of states and coming under private control, but that should not blind us to the origins of the nation's transportation system in state promotion. Banking was always under the control of state governments, with the exception of the two Banks of the United States, and it was not until 1863 that the federal government took an active role in chartering and regulating banks. State governments were at the center of the development process.

There were no banks in America before the revolution. States began chartering banks in the 1780s and 1790s. At first the numbers were small, but they increased steadily with time. By the 1830s there were over 600 state chartered banks with a capital of over \$400 million dollars.³⁸ A corporate charter endowed the bank with limited liability, which was important to bankers whose profits came mainly from borrowing money in the form of bank notes. The legal ability to issue bank notes soon became a privilege that required a bank charter. Bank charters were

valuable licenses to engage in a profitable activity. It is not surprising that the first banks often gave the state ownership shares in the bank as part of the cost of obtaining the charter.

Massachusetts, New York, Pennsylvania, Maryland, Virginia, and South Carolina all came to hold a financial interest in banks in this way. As we pointed out earlier, dividends on bank stock were an important element in the revenues of state governments in the east.

Once a state acquired an ownership interest in a bank, it faced conflicting incentives when asked to charter a second bank. The profitability of a bank depended, in part, on competition. As more banks were chartered, rates of return on the capital invested in individual banks declined. Existing banks opposed the formation of new banks, but states were constantly asked to open new banks, particularly in developing areas where financial systems were primitive (for example, the western parts of New York and Pennsylvania in the 1810s.) States that held large amounts of stock in existing banks were less likely to charter new banks, as happened in Pennsylvania. Other states, like Massachusetts, decided to sell their bank stock and tax bank capital. These states tended to have many more, and smaller, banks.³⁹ By the 1810's all of the states on the eastern seaboard were promoting or involved in banking in some way.

In places like New York, Philadelphia, Baltimore, and Boston there were many groups of businessmen who aspired to have a bank. In these places states could sell bank charters and receive substantial revenues from doing so. In per capita terms, there were more banking services in the northeast than in the rest of the country. That is, more bank notes per capita, more bank credit, more bank capital, etc.⁴⁰ Moving west and south from the northeast, however, the size and sophistication of commercial centers decreased (the exception was New Orleans), the number of banks decreased, the number of farmers increased, but the need for banking

services did not decline. States in the south and west wanted banks just as much as New Englanders, but the low density of population, the high share of farmers, and the geographic concentration of crops meant that banking was riskier. Banks in Mississippi, for example, made loans on cotton, both direct to farmers to plant crops and by discounting bills of exchange to facilitate getting the crop to market. If the cotton crop failed or cotton prices collapsed, banks in Mississippi were in trouble. The ability to diversify banking risk in Mississippi was limited, unlike banks in major eastern commercial centers with many opportunities to diversify their risk. The same was true in the northwest, except there it was markets for wheat, corn, and other grains that mattered.

States in the south and west responded in two ways. First, states invested their own funds in banks, providing bankers with larger amounts of public capital (as opposed to the early eastern states who usually received bank stock as part of the charter process, and did not put state funds *into* the bank.) Second, there were fewer banks and the banks tended to be larger. Table 6 gives the number of banks, total capital, and capital per bank for each state in 1837, and, in the lower panel of the table, each region's share of the national total of all banks, all bank capital, and, in each region, the average capital per bank. Western states had many fewer banks. Ohio and Louisiana are the only states west of the Appalachians with more than ten banks, and they are the two oldest and most developed western states by the 1830s. Most frontier states had four banks or less.⁴¹ Southern states in general had larger banks than northern states, but in both the north and the south banks were much larger in the west than in the east. Banks in the southwest had ten times the average capital of banks in New England.

The last three columns of the table provide some insight into state investment in banks in

the west. Column 4 gives the amount of state debt incurred to invest in banks up 1837. Only states in the frontier south and west invested in banks. Column 5 gives state investment as a share of total bank capital. With the exception of Kentucky, state governments provide more than half of bank capital in each of these states.⁴² State involvement was critically important to the development of banks in the south and west. Column 6 gives the share of all state borrowing that went to investments in banks. We'll return to this shortly.

The First and Second Banks of the United States were extremely important to the development of American financial systems. They spanned the country with their branches, provided a uniform paper currency, and stabilized the conduct of federal financial activities. But they were not the only, or even the most important elements of the banking system that developed in the early 19th century. By 1836, state chartered banks had ten times the capital of the Second Bank. When the Second Bank lost its charter, it was quickly rechartered as the Bank of the United States of Pennsylvania. The banking system continued to develop without a national bank, and there is no reason to believe that the banking system would not have developed before 1836 if there had not been a national bank.

State chartered banks were the heart of the developing American financial system. In the northeast, private banking interests approached state governments and were willing to pay for charters. State banking policy in New England and the Mid-Atlantic regions promoted development by facilitating the creation of banks, the capital came from private sources. In the south and west, states played a much more active role in providing capital and organizing banks.

State involvement in transportation investment has as a long history as well. By the 1780s, states were chartering private companies, providing subsidies, and purchasing stock in

canal, bridge, road, and turnpike companies.⁴³ Virginia chartered the Potomac Company and the James River Company in 1785 and the Dismal Swamp Company in 1790. In 1792, New York chartered two companies, the Western Inland Lock Navigation Company and the Northern Inland Lock Navigation Company, to open canals to Lake Ontario in the west at the St. Lawrence in the north via Lake Champlain. Maryland chartered the Chesapeake and Delaware canal in 1799. By 1811, Pennsylvania had spent \$825,000 to build turnpikes. Massachusetts also invested in turnpikes. Unlike their investments in banks, however, transportation projects were rarely profitable investments for state governments. For a few brief years around 1805, it appeared the federal government might get involved in transportation. Jefferson's second inaugural message, cited earlier, led Congress to ask the Secretary of the Treasury, Albert Gallatin, to prepare a report laying out a possible system of internal improvements. Gallatin's famous report proposed a network of canals that would have connected the disparate parts of the country at a cost of over \$20,000,000. Most of the projects envisioned in the report were eventually carried out in one form or another by state and/or private interests, but the federal government spent very little on transportation before the 1820s (see Table 5).

Despite federal inaction, there was widespread support for internal improvements. In 1811, the New York legislature authorized the issue of \$5,000,000 in state bonds to build a canal; a plan sidetracked by the outbreak of the War of 1812. Virginia created a Board of Public works in 1816. In 1817, after failing to receive federal support, New York embarked on the largest infrastructure project of its time, the Erie Canal. The canal turned out to be a phenomenally successful investment. Completed in 1825, it soon returned funds to the state over and above maintenance costs and interest payments. Now it appeared canals could prove as

profitable as banks. The pattern of state transportation investment, after the Erie success, was influenced by two factors.

The first was geography. Areas with access to ocean transportation did not need to build canals, although they often improved their rivers and built short canals to bring their interior regions into contact with ports. The real payoff was the construction of interregional canals, like the Erie, that reached into the northwestern interior. In the late 1820s Ohio, Pennsylvania, and Maryland started canals, all with hopes they would pay for themselves and return a handsome dividend to the state treasury. Virginia, South Carolina, and Georgia contemplated projects that would open up routes into Tennessee and Kentucky.

The second factor was the youth of western states. Indiana became a state in 1816, Mississippi in 1817, Illinois in 1818, Alabama in 1819, and Missouri in 1820. Indiana was the largest of those states in 1820 with a population of just 147,000. It was not until the early 1830s, that western populations, swelled by rapid migration population inflows, and western state budgets, spurred by the rapidly expanding economy and the boom in federal land sales, enabled these young states to contemplate transportation investments of their own. In 1836 and 1837, Indiana, Illinois, and Michigan started new canals and railroads systems. In the same years, New York, Ohio, and Pennsylvania committed to expanding their existing systems. Rising western populations raised land prices; rising land prices stimulated public land sales; increased sale of public land raised the property tax base; and states began to think they could afford to build better transportation systems, which would further raise land prices, increase land sales, and expand the property tax base. The direction of causation in this story is difficult to disentangle, but all the factors came together to produce a major economic boom in the 1830s.

The boom affected southwestern states, just as it affected northwestern states, but southern states were not in need of major transportation investments. Their already navigable rivers ran to the sea. In the south, banks dominated state investments. Louisiana invested \$23 million in banks beginning in 1824. Alabama, Georgia, and Florida made substantial investments in the early 1830s, while Mississippi and Arkansas committed millions to banks in 1837 and 1838. As table 6 shows, moving west from Florida, into Alabama, Mississippi, Louisiana, Tennessee, and Missouri more than half of the banking capital in each of these states by 1837 came from state investment and almost all of the debt in these states was issued for the purpose of investing in banks.⁴⁴ Northwestern states needed banks too, Illinois and Indiana made significant investments in their state banks.

States had always borrowed money to finance long term capital projects. But the pace of state borrowing increased dramatically in the 1830s. State debts expanded from a few million in 1820, to \$80 million in 1830, and \$200 million in 1841. Figure 12 gives state debt issued each year in the 1830s. The relative size of some of the state debts is truly amazing. In 1836, Indiana, with a population of roughly 600,000 and a state budget of \$50,000 a year, authorized a bond issue of \$10,000,000 in 5 percent bonds. Michigan, with a population of no more than 200,000 and state revenues of \$17,000 in 1836, authorized a bond issue of \$5,000,000 of 5 percent bonds in 1837.⁴⁵ Earlier we saw the implications for tax revenues in Indiana. Per capita tax revenues in the 1840s were ten time higher than they had been in the 1830s. Total and per capita state debts outstanding in 1841 are given for each state in Table 7.

In 1837, the American economy was hit by a financial panic and in 1839 a depression began that lasted until 1843. Many of the transportation and banking projects of the western

states were abandoned. Indiana, Illinois, Michigan, Arkansas, Louisiana, Mississippi, Florida (still a territory), Maryland, and Pennsylvania stopped paying interest payments on their state bonds in 1841 and 1842. Mississippi and Florida formally repudiated their bonds, while Louisiana, Arkansas, and Michigan ultimately failed to repay part of the money they had borrowed. The other states eventually resumed payments on their bonds, and in the end repaid all of the principle and most of the back interest.⁴⁶ New York, Ohio, and Alabama narrowly avoided default.

It is tempting to think of the “canal” boom of the 1830s as the result of naive western states optimistically thinking they could borrow to build canals, railroads, and banks and live off the dividends and tolls. Such a view is inconsistent with the history recounted in this section. States had been deeply involved in the creation of banks and transportation companies since the 1780s. In the case of banks, state involvement had proven profitable, in the sense that states who owned stock in banks received substantial and steady dividends, and those states that taxed banks earned a hefty share of state revenues from bank taxes. In the case of transportation, until the Erie canal, state investments had rarely been directly profitable, but there is little reason to doubt that the overall returns to the state treasury in terms of higher property tax revenues on increased land values made these good investments.⁴⁷ What happened after 1839 was an unexpected economic depression, that was caused, in part, by the terrible fix the states found themselves in.

States reacted predictably to the immediate crisis. New York passed a “Stop and Tax” law in 1842: stop construction on the canals and reinstate the property tax. Indiana’s new constitution, passed in 1851, left it up to the voters to ban banking entirely (they chose not to)

and made it unconstitutional for the state to borrow to finance internal improvements. But by and large this “revulsion” against internal improvements was temporary. What changed permanently was the way states approached the process of promoting economic development. Already in 1837, Michigan and New York had adopted “free banking.” Under a free banking act, anyone could obtain a bank charter who met minimum requirements for capital investment. Free banks were regulated, the “free” referred to entry, not to regulation. Twenty states had free banking systems by 1860. The corollary to free banking in manufacturing and other sectors of the economy were general incorporation acts. In every state in 1790, a corporate charter could only be obtained by an act of the state legislature. This made charters valuable, as we have seen, but it also raised the possibility that business interests and politicians would conspire to limit competition. This was always a problem if the state relied on corporate charters or investment dividends for revenues, as we saw earlier as well. Eleven states adopted general incorporation clauses in their constitutions in the 1840s, and ___ states had general incorporation acts in place by 1860 (Evans). When states began moving toward free banking and general incorporation, the importance of asset income necessarily declined, and state property taxes rose in importance as a share of state revenue, as shown in Table 3.

The depression of 1839 ended state investment in transportation in some states. Indiana, Illinois, Michigan, and Maryland wouldn’t spend a penny on transportation until well after the Civil War.⁴⁸ But voters in New York approved a bond issue to complete the canal system in 1850 (?). Ohio struggled through the 1839 depression to finish its canal network. Louisiana, despite being in default on bank bonds issued in the 1820s, borrowed in national and international capital markets in to build railroads in the 1850s. Nobody would lend money to

Mississippi or Florida, but Missouri borrowed millions to build railroads in the 1850s.

Active promotion of economic development shifted in the later 19th century from state to local governments. In 1841, state government debt was eight times local government debt. Almost all of the debt was incurred to invest in banks, canals, and railroads. In 1902, when the first complete census of American governments was taken, local government debt was eight times state debt. Local debt was, as before, primarily for economic development: railroads; water and sewage, public power, and education. American governments kept promoting economic development, but the level of government changed

VI. Conclusions

The history of American government cannot be written without writing the history of American governments. Policies to promote of economic development move from one level of government to another constantly through the nation's history. In 1776, there were fourteen individual government policies, not one. By the 1830s there were 26 states, each pursuing its own development agenda. By the end of the 19th century local governments had taken the lead in infrastructure investment. In 1940, when a complete count of the number of governments was taken, there were 140,000 governments in the United States (today there are about 80,000). Keeping track of how the American government interacts with the economy first requires that we keep track of what all American governments are doing.

From the nation's very beginnings in 1776, state governments took the lead in economic policy, not the national government. The Articles of Confederation gave the federal government a monopoly over defense and international relations, but power over very little else. Such a weak central government could not provide even the basic service, national defense, required of

it. The second Constitution, written in 1787, created a stronger national government, a government possessing its own independent source of tax revenues. The Constitution gave the national government the sole power to conduct international affairs and military defense, to regulate the currency, to regulate international trade, and to disperse the western lands. At the same time, the Constitution hemmed in the national government by granting unenumerated powers to state governments.

In the 1790s, the federal government set up an active policy of financial promotion and protective revenue tariffs. Tariffs account for 85 percent of federal revenues, and military defense over 52 percent of federal expenditures. But using the tariff to actively promote American manufacturing raised substantial political opposition, and after the tariff of abominations in 1828, tariff rates gradually declined and talk of using the tariff as a means of economic development disappeared. The two federally chartered banks did exert a regulating influence on the money supply between 1792 and 1836, but they also generated intense political opposition. Congress failed to renew the first bank's charter in 1812, and could not over ride President Jackson's veto of the charter renewal in 1832. The main function the federal government continued to provide was military defense (and at times military offense) and international relations.

It was the states that developed active policies to promote economic development by encouraging public and private investment in banking and transportation. State development policy began taking shape in the 1780s and continued to grow in size and importance. States were often investors in early banks, and in several eastern states banks became an important source of state government revenue. As western states entered the Union, they too sought to

develop banks and canals. Frontier states invested heavily in banks in the 1820s and 1830s. Following the success of the Erie Canal, eastern states like Pennsylvania, Maryland, and Massachusetts began canal and railroad projects, followed in the 1830s by a wave of transportation investment in the north west. In the economic depression that began in 1839, many of these western state projects in banking and transportation came to a bad end. States in some parts of the country began receding from active investment, although others continued to actively invest right up to the Civil War.

In the 1840s, following the default crisis, states began putting in place arrangements that made it easier for corporations to form and guaranteed equal access to corporate charters for all members of the economy. Free banking laws and general incorporation acts implemented these policies. Many states wrote explicit provisions into their constitutions requiring legislators to write general incorporation acts. The result was a growing number of corporations and banks, throughout the country.

Throughout the early 19th century, the federal government wanted to promote economic development, but found the political complexity of reaching a consensus about what should be done too daunting. Federal policy changed very little, except to recede from development promoting policies, between 1790 and 1860. State governments, on the other hand, actively experimented with new ways to promote development, to help farmers get their goods to market with better transportation and finance, and to raise land values, which helped the farmers and the state treasuries that depended on the property tax. Not everything they tried worked and some of their projects failed spectacularly. But the idea that government should play a positive role in the economy was never seriously challenged, although it was often intensely debated.

Endnotes

1. See Adams *Diary and Autobiography*, Butterworth, ed. III, pp. 335-37.

2. This essay neglects two important areas of government action: education and the law. State governments provided a minimum amount of support for public education before 1860, but local governments, with wide variety across the country, began moving towards public schools. Both state and federal courts made large contributions to the promotion of economic development. Two features stand out. First, by the lights of the early 19th century, the courts were independent and unbiased. The “rule of law,” the idea that governments should be of laws not men, and particularly that governments and politicians should abide by the same laws they made for everyone else was an important ideological element in the American legal system. Second, judges and the bar thought systematically about how law affected the economy, and consciously and effectively began changing the structure of American common law to “release energy” in the words of James Willard Hurst.

3. For a discussion of the first state constitutions see Paul, Lutz, Tarr, Green, and Kruman. Kruman is particularly valuable as an antidote to the idea that the first state constitutions were simple minded and gave too much power to legislatures, an idea articulated by Wood.

4. For the ever changing state of suffrage see Keyssar. Judicial independence was a principle of American constitutional theory, but as in the national constitution, the actual form that judicial institutions took was initially a legislative rather than constitutional matter. Over time states adopted much more specific constitutional forms of judicial systems, while the national government has left the federal judiciary to the Congress.

5. From the very beginning, ownership and distribution of western lands were contentious issues. Virginia’s extensive claims in the west caused the most difficulty.

6. “All charges... shall be defrayed out of a common treasury, which shall be supplied by the several States, in proportion to the value of all land within each State, granted to or surveyed for any person, as such land and the buildings and improvements thereon shall be estimated according to such mode as the United States in Congress assembled, shall from time to time direct and appoint.” (Article VIII).

7. Congress was able to decide some matters by a simple majority, and others by a super majority of nine states (Article IX), but changes in the Articles required unanimous agreement, “And the articles of this confederation shall be inviolably observed by every State, and the Union shall be perpetual; nor shall any alteration at any time hereafter be made in any of them; unless such alteration be agreed to in a Congress of the United States, and afterwards confirmed by the Legislatures of every State” (Article XIII).

8. The story of national finances during the war and after is told in Ferguson, *Power of the Purse*.

9. The table is based on Wallis, 2000. The federal numbers are accurate, the state numbers are reliable but not completely accurate, and the local numbers are rough guesses at best.

10. Adjusting for inflation would have some effect on these numbers, but the basic features would still remain.

11. Repaying the principle on government debts is clearly an expense for the government, but it is not treated as an "expenditure" in the government accounts. To do so would double count the borrowed money. If the government borrows \$100 to build a bridge, the construction costs are counted as an expenditure. If the repayment of the \$100 principle was also counted as an expenditure, then total expenditures would be \$200, when the government really spent just \$100. Interest payments on debts are an expenditure. In a similar way, borrowed funds are not counted as revenues.

12. Slaughter, *The Whiskey Rebellion*.

13. The four states are regionally representative and are ones for which we have relatively complete data. Individual state revenues are weighted by population to construct the average in the figure.

14. See Goodrich's *Government Promotion of Canals and Railroads* for a history of transportation investment in the states.

15. Wallis, Sylla, and Legler [1994], p. 126. We do not have adequate fiscal data on Alabama and Georgia, but see Brantley [1961] for Alabama and Wallenstein for Georgia.

16. For the cost of farm building see Atack and Passell. For the share of capital held in the form of land improvements see Gallman.

17. This type of bill of exchange was often a "sight" bill, meaning that the agent's representative in New York had 60 days from the presentation of the bill, the sight, to pay cash.

18. The price differentials are taken from Thomas Berry *Western Prices*, the prices in New York and Philadelphia from *Historical Statistics*.

19. See the discussion in Scheiber, p. Ohio and New York worked together to get freight on their systems.

20. The federal government minted gold and silver coins, but did not print any paper money until the Civil War.

21. The distinction in this argument may be a bit difficult to follow. The Constitution declares itself the law of the land, but is vague on how that works. Eventually the Supreme Court asserted its power to be the ultimate arbiter of what is and is not constitutional, but that is not a

power delegated to the Supreme Court in the Constitution. Presidents Madison (the Bonus Bill in 1817) and Jackson (the Maysville Road bill in 1830) both vetoed important Congressional legislation on the grounds that it was “unconstitutional,” but their stands (particularly Jackson’s) appear to be motivated more by political than constitutional objections. By that we mean that earlier and later Congresses and President’s passed and signed legislation that did exactly what Madison and Jackson had vetoed without changing the Constitution. Madison and Jackson’s assertion that something was unconstitutional were simply that, assertions. But their statements carried considerable weight at the time, since no one had yet figured out just how a Congressional Act or state law was to be declared “unconstitutional.”

22. Richardson, *Messages and Papers of the Presidents*, Vol. I, p. 367.

23. The formula had a slight bias toward small states, since every state had two Senators, but Representation varied with population.

24. Clay and Calhoun knew that their bill would be defeated if they proposed to spend most of the \$2 million in, say, Kentucky and South Carolina, so they fought to the very end to not specify the projects that the money would be spent on in the bill. See Larson, 2000.

25. The 1836 distribution act allocated the federal surplus (it turned out to be \$36 million) generated by the extraordinary land sales in 1835 and 1836, see Figures 1 and 2. The 1817 Bonus Bill would have allocated the \$2 million bonus and the dividends on federal stock in the BUS. The 1841 Land Act would have allocated land sales revenues, net of land office costs, among the states. Land revenues averaged about \$2 million a year.

26. This was the same bill that distributed land sales revenues to the states. The distribution privilege was tied to the tariff, and President Tyler raised the tariff in 1843 and ended distribution.

27. Feller, *Public Lands*, p. 194.

28. *An Ordinance for the government of the territory of the United States northwest of the river Ohio*. Confederate Congress, July 13, 1787. As reported in Poore, p. 432.

29. First Congress, Second Session, Poore, p. 1664.

30. Fifth Congress, Second Session, Poore, p. 1050.

31. Eight Congress, First Session, 1804, Poore, p. 694.

32. *Enabling Act for Missouri*, Sixteenth Congress, First Session, Poore, p. 1104.

33. Hamilton’s plans were laid out in a series of Reports to Congress: First Report on the Public Credit, January 14, 1790; Report on a National Bank, December 14, 1790; Report on Manufacturers, December 5, 1791; and Second Report on the Public Credit, January 16 and 21, 1795. These are conveniently reprinted, along with Hamilton’s letter to President Washington

on the Constitutionality of the National Bank, in McKee.

34. Hamilton's letter to Washington on the Constitutionality of a National Bank, McKee, p. 101, emphasis in the original.

35. See Irwin, 2003, for the success of Hamilton's tariff plan in Congress.

36. This, of course, is the same Andrew Jackson who felt the federal government had too much power, and whose reelection campaign in 1832 was based on his positions against federal involvement in banking (the charter veto) and internal improvements. Ellis tells the history of the Nullification crisis.

37. The numbers are taken from Gates, p. 86. Other additional to the public domain included the cession of Florida and the Gadsen purchase.

38. Fenstermaker provides detailed information on the chartering of state banks before 1837.

39. The relationship between ownership and taxation of banks to the number of banks chartered in Pennsylvania, Massachusetts, and other states is examined in Wallis, Sylla, and Legler.

40. See Bodenhorn, 2000, p. 63.

41. The numbers for Mississippi and Michigan are larger because of the creation of banks in 1835 and 1836.

42. The 148% figure in Illinois is the result of a large state investment in 1837, which occurred after the figure on bank capital was collected in January. The same is true for Alabama.

43. The classic history of government involvement in transportation remains Goodrich [1960], which has been supplemented by Larson, [200?].

44. Arkansas became a state in 1837 and the first act of the state legislature was to create a bank capitalized by state bonds.

45. Information on state finances in the 1830s and 1840s is available at ICSPR Richard Sylla, John Legler, and John Wallis "Sources and Uses of Funds in State and Local Governments, 1790-1915: [United States]", Data set 1993-05-13.

46. How much was repaid and how quickly varied from state to state. Pennsylvania and Maryland resumed payments by 1848 and paid back interest in full. Indiana and Illinois were still struggling in the 1850s.

47. For a paper that estimates the effect of railroad construction on land values and property tax revenues in the late 19th century see Heckelman and Wallis, and for a direct measure of canal construction on land values in Indiana in the mid-1830s, see Wallis.

48. Of course, these states would spend again for transportation in the 20th century when the automobile was developed. While the state of Illinois stopped spending, local governments continued to borrow money to invest in railroads, and a number of cities and counties went bankrupt in the 1870s.

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Table 1
Government Revenues in Levels and Share of GNP

Decade	Federal	State	Local	Total	Share of GNP
1800	1.96	0.42			
1810	1.80	0.36			
1820	2.52	0.56			
1830	2.07	0.54			
1840	1.50	0.88	1.23	3.60	4.0%
1850	1.93	0.99	1.23	4.14	4.2%
1860	3.32	1.72	2.17	7.20	5.4%
1870	9.82	2.34	5.48	17.64	8.4%
1880	6.39	1.70	4.98	13.07	5.7%
1890	5.74	1.84	5.96	13.55	6.4%
1900	6.42	2.43	8.83	17.68	7.2%

Share of GNP	Federal	State	Local	Total
1902	3.0%	0.8%	4.0%	7.8%
1913	2.4%	0.9%	4.2%	7.5%
1922	5.8%	1.7%	5.2%	12.6%
1927	4.7%	2.1%	6.0%	12.8%
1934	6.0%	3.8%	7.6%	17.4%
1940	7.0%	5.0%	5.8%	17.9%
1946	22.3%	3.7%	3.6%	29.5%
1952	20.4%	4.1%	4.0%	28.5%
1957	19.3%	4.6%	4.7%	28.6%
1962	18.5%	5.2%	5.5%	29.2%
1967	19.7%	5.7%	5.4%	30.8%
1972	18.4%	6.9%	6.2%	31.5%
1977	19.2%	7.6%	6.0%	32.8%
1982	21.6%	8.2%	6.2%	36.1%
1987	21.0%	9.1%	6.9%	37.0%
1992	20.8%	9.3%	7.3%	37.5%

Sources:

National revenues from Historical Statistics

State revenues from Wallis, Sylla, and Legler

Local revenues from Legler, Sylla, and Wallis

Gnp from Gallman, vol 30: 1839 1849 1859;

Balke and Gordon remaining years

Population from Historical Statistics

Post 1902 from Historical Statistics of Government Finance.

Table 2
Annual Averages
Per Capita Revenues

	Per Capita Revenues			Property Tax Share		
	1808 to 1812	1813 to 1817	1818 to 1824	1808 to 1812	1813 to 1817	1818 to 1824
CT	0.32	0.61	0.29	0.56	0.66	0.59
DE	0.38	0.40	0.27	0.48	0.45	0.10
MD	0.11	0.41	0.39	0.00	0.00	0.02
NH	0.10	0.23	0.21	0.00	0.00	0.43
NY	0.44	0.93	0.98	0.03	0.20	0.23
OH	0.17	0.37	0.22	1.00	0.87	0.84
PA	0.47	0.59	0.43	0.00	0.00	0.00
RI	0.13	0.33	0.20	0.51	0.43	0.50
SC	0.72	1.04	1.02	0.34	0.62	0.49
VA	0.42	1.00	1.05			
VT	0.19	0.22	0.18	0.52	0.55	0.73
Simple Average	0.31	0.56	0.48	0.34	0.38	0.39
Population Weighted Average	0.38	0.72	0.67	0.16	0.24	0.26
Population Weighted Average w/o Ohio & Delaware	0.28	0.68	0.64	0.10	0.17	0.18

Table 3
Property Tax Revenues

	Per Capita Property Tax Revenues		Property Tax Share of Total Revenue		Per Capita Revenues Net of Loans	
	1835 to 1841	1842 to 1851	1835 to 1841	1842 to 1851	1835 to 1841	1842 to 1851
MA	0.01	0.04	0.01	0.04	1.04	1.08
MD	0.03	0.87	0.02	0.50	1.62	1.73
NY	0.01	0.14	0.00	0.08	1.45	1.72
PA	0.02	0.53	0.02	0.37	1.58	1.43
RI	0.00	0.05	0.00	0.10	0.56	0.47
DE	0.01	0.00	0.03	0.00	0.39	0.43
SC	0.00	0.00	0.01	0.00	0.50	0.56
NC	0.03	-	0.19		0.18	
weighted average	0.01	0.25	0.02	0.16	1.21	1.28
CT	0.14	0.13	0.47	0.50	0.29	0.27
NH	0.19	0.20	0.94	0.80	0.21	0.25
VT	0.21	0.23	0.34	0.77	0.60	0.30
weighted average	0.18	0.18	0.58	0.68	0.37	0.27
IL	0.14	0.22	0.26	0.82	0.54	0.26
IN	0.23	0.34	0.84	0.28	0.28	1.23
OH	0.21	0.52	0.27	0.46	0.80	1.11
AK	0.33	0.18	0.88	0.29	0.37	0.65
MS	0.29	0.62	0.54	0.46	0.53	1.35
KY	0.25	0.27	0.40	0.63		
MI	0.80	1.21	0.28	0.56	2.88	2.15
weighted average	0.25	0.45	0.43	0.51	0.59	0.90
National weighted average	0.11	0.32	0.20	0.33	0.94	1.07

Table 4
Price Differentials Cincinnati and New York
Bushel of Flour

	1816-1820	1856-1860
Price in East	\$8	\$5
Difference in Price	\$2.48	\$0.28
Price in West	\$5.52	\$4.72
Interest Rate	24%	8%
Interest Paid	\$0.33	\$0.09
Interest as Percentage of Price Differential	13%	34%
Interest as Percentage of Price in West	6.0%	2.0%
<hr/>		
Price	1816-1820	\$2.48
Differential	1821-1825	\$2.81
Over time	1826-1830	\$1.78
	1831-1835	\$1.43
	1836-1840	\$1.02
	1841-1845	\$1.37
	1846-1850	\$1.68
	1851-1855	\$1.36
	1856-1860	\$0.28

Table 5
Federal Transportation Expenditures
1800 to 1860

By Function	Level	Share	Itemized	Not Itemized
Unspecified Navigation	\$14,240	0.26		\$14,240
Roads	\$9,821	0.18	\$9,821	
Harbors	\$8,256	0.15	\$7,737	\$519
Coastal Navigation	\$7,428	0.14	\$5,511	\$1,917
Rivers	\$5,845	0.11	\$5,327	\$518
Public Land Funds	\$4,745	0.09	\$4,745	
Canals	\$1,917	0.03	\$1,917	
Internal Navigation	\$1,695	0.03	\$1,692	\$3
Other	\$940	0.02		\$940
Total	\$54,888	1.00	\$36,750	\$18,137
Itemized Total	\$36,750	0.67		
NonItemized Total	\$18,138	0.33		
By Decade				
1800-1809	\$193	0.01		
1810-1819	\$1,931	0.05		
1820-1829	\$4,465	0.12		
1830-1839	\$16,365	0.45		
1840-1849	\$3,178	0.09		
1850-1859	\$9,790	0.27		
1800-1860	\$36,750	1.00		
By Region				
New England	\$3,185	0.09		
Mid-Atlantic	\$4,260	0.12		
East-North Central	\$10,006	0.27		
West-North Central	\$2,414	0.07		
South Atlantic	\$9,340	0.25		
East-South Central	\$3,081	0.08		
West-South Central	\$3,152	0.09		
Mountain	\$663	0.02		
Pacific	\$648	0.02		
Total	\$36,750	1.00		

Source: Malone, 1998, Tables 2.1, 2.2, 3.1, and 3.3.

Note: Non-Itemized Rivers and Harbors were reported as \$1,037,521;

I have divided them equally between "Rivers" and "Harbors."

Table 6
Banks and Bank Capital and
State Investments in Banks in 1837

State	Banks (1)	Capital (2)	Capital per Bank (3)	Bank Debt (4)	State Investment Share of Capital (5)	Bank Debt Share All Debt (6)
ME	55	5,226,700	95,031		---	---
NH	27	2,839,508	105,167		---	---
VT	6	510,000	85,000		---	---
MA	123	37,074,690	301,420		---	---
RI	62	9,837,171	158,664		---	---
CT	31	8,744,697	282,087		---	---
NY	98	37,101,460	378,586		---	---
NJ	25	4,142,031	165,681		---	---
PA	49	23,750,338	484,701		---	---
DE	4	818,020	204,505		---	---
MD	21	10,438,655	497,079		---	---
DC	7	2,204,415	314,916		---	---
VA	5	6,731,200	1,346,240		---	---
NC	3	2,525,000	841,667		---	---
SC	10	8,636,118	863,612		---	---
GA	16	11,438,828	714,927		---	---
FL	4	2,046,710	511,678	1,500,000	73%	100%
AL	3	7,572,176	2,524,059	7,800,000	103%	72%
LA	16	36,769,455	2,298,091	22,950,000	62%	97%
MS	9	12,872,815	1,430,313	7,000,000	54%	100%
TN	3	5,092,665	1,697,555	3,000,000	59%	42%
KY	4	7,145,326	1,786,332	2,000,000	28%	27%
MO	1	250,000	250,000	2,500,000	100%	100%
IL	2	2,014,760	1,007,380	3,000,000	149%	26%
IN	1	1,585,481	1,585,481	1,390,000	88%	12%
OH	32	9,247,296	288,978		---	---
MI	9	1,400,000	155,556		---	---
TOTAL	627	293,015,515	467,329			
Regional Shares	Banks	Capital	Capital Per Bank			
New England	48%	22%	211,292			
Mid Atlantic	33%	27%	384,583			
South Atlantic	6%	11%	825,733			
South West	5%	21%	2,009,907			
North West	8%	7%	441,691			

Table 7
Total State debt and debt per capita in 1841,
and whether a State defaulted.

State	Total Debt 1841	Debt PC 1841	Default?
FL	\$4,000,000	\$74.07	Y
LA	\$23,985,000	\$68.14	Y
MD	\$15,214,761	\$32.37	Y
IL	\$13,527,292	\$28.42	Y
AK	\$2,676,000	\$27.31	Y
MI	\$5,611,000	\$26.47	Y
AL	\$15,400,000	\$26.06	N
PA	\$33,301,013	\$19.32	Y
MS	\$7,000,000	\$18.62	Y
IN	\$12,751,000	\$18.59	Y
NY	\$21,797,267	\$8.97	N
MA	\$5,424,137	\$7.35	N
OH	\$10,924,123	\$7.19	N
WI	\$200,000	\$6.45	N
SC	\$3,691,234	\$6.21	N
TN	\$3,398,000	\$4.10	N
KY	\$3,085,500	\$3.96	N
ME	\$1,734,861	\$3.46	N
VA	\$4,037,200	\$3.23	N
MO	\$842,261	\$2.19	N
GA	\$1,309,750	\$1.90	N
NH	\$0	\$0.00	N
CT	\$0	\$0.00	N
VT	\$0	\$0.00	N
RI	\$0	\$0.00	N
NC	\$0	\$0.00	N
NJ	\$0	\$0.00	N
DE	\$0	\$0.00	N

Notes: Debt in 1841 and 1880 taken from 1880 Census.

Figure 1

Federal Expenditures Per Capita

Nominal Dollars



Figure 2

Federal Government Revenues Per Capita

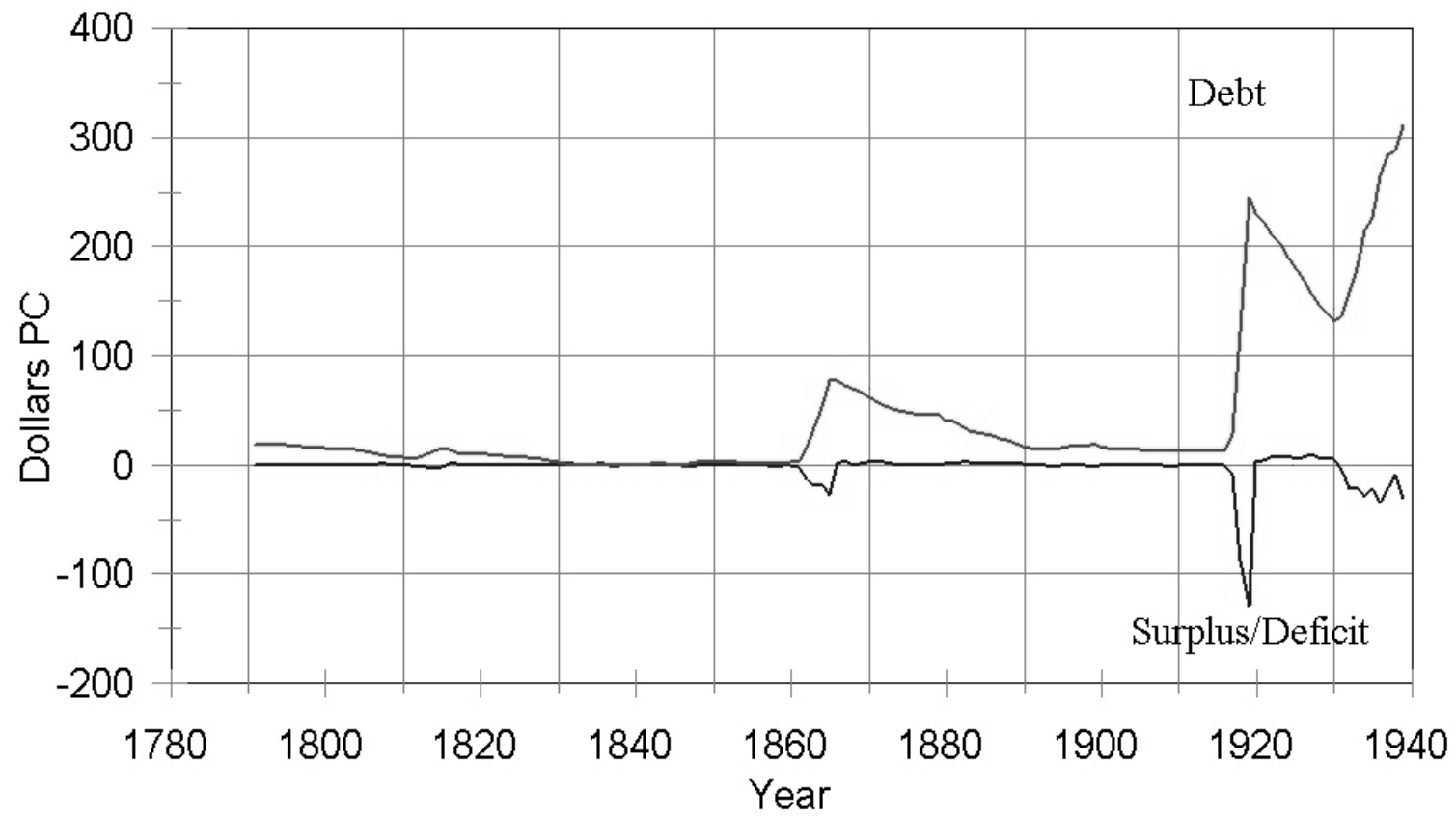
nominal values



Figure 3

Federal Debts and Deficits

Nominal Dollars per Capita

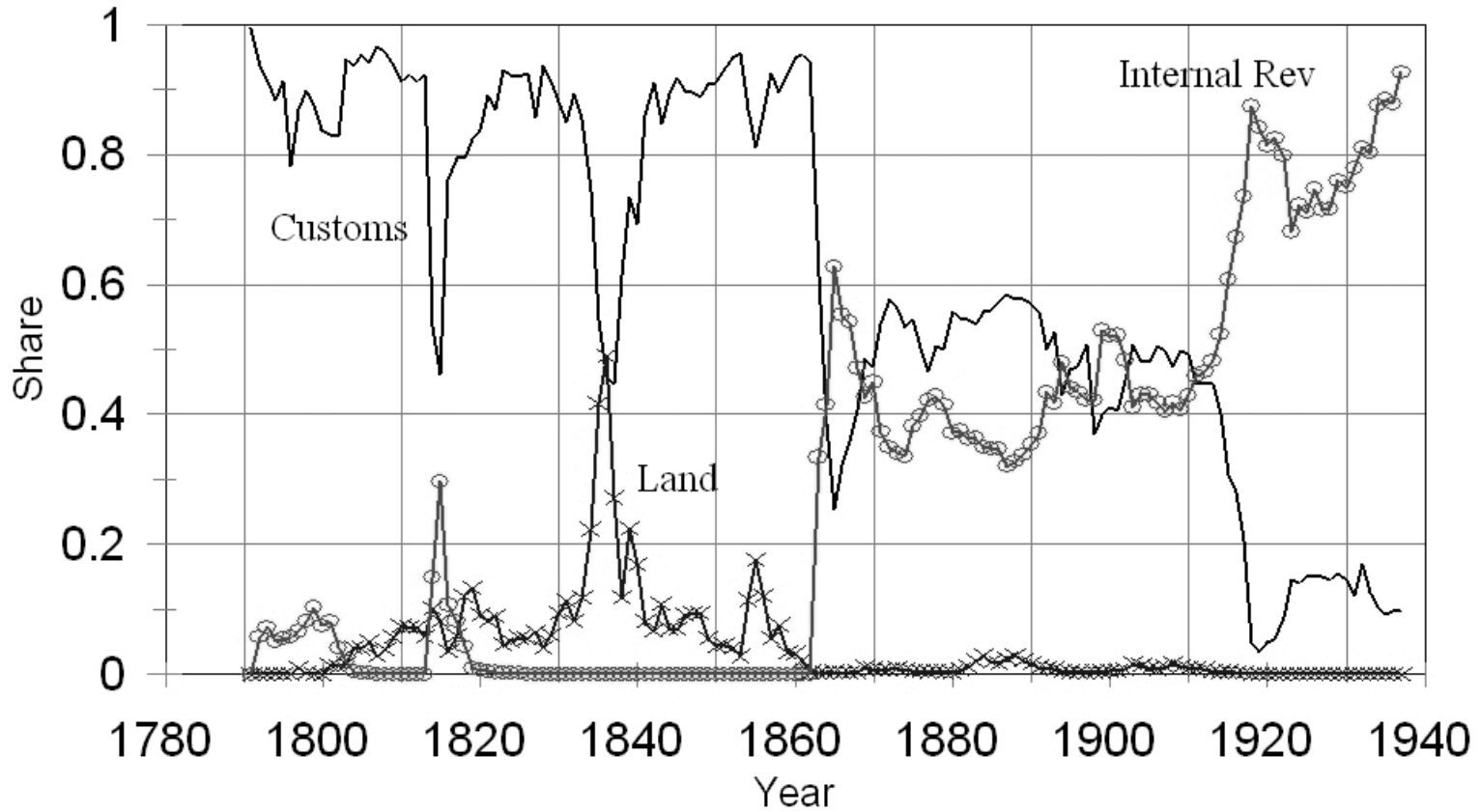


— Surplus — Debt

Figure 4

Custom, Land, and Internal Revenues

Share of Total Revenues



— Customs

—x— Land

—o— Internal Revenue

Figure 5

Interest and Military Expenditures

Share of Total Federal Expenditures

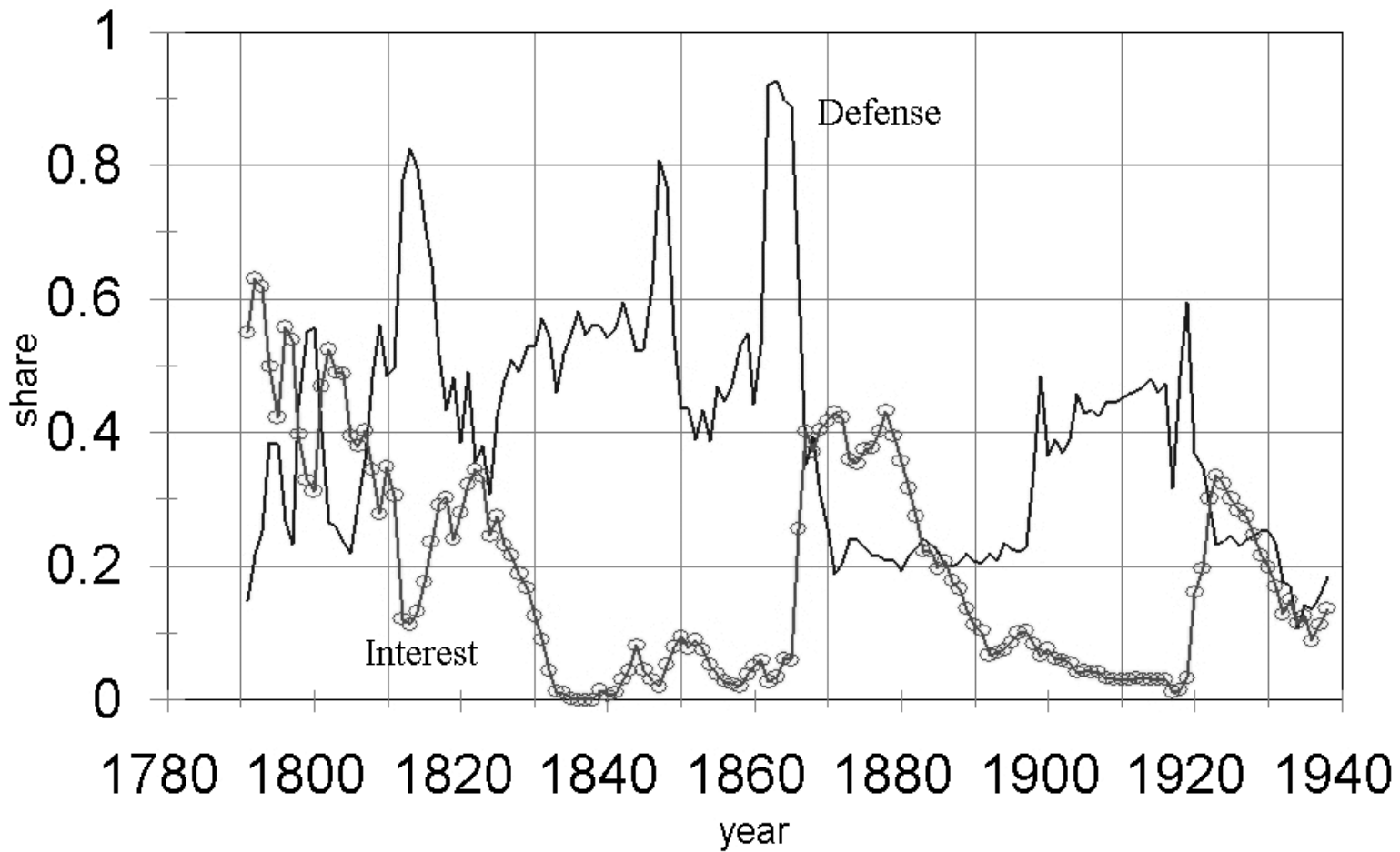
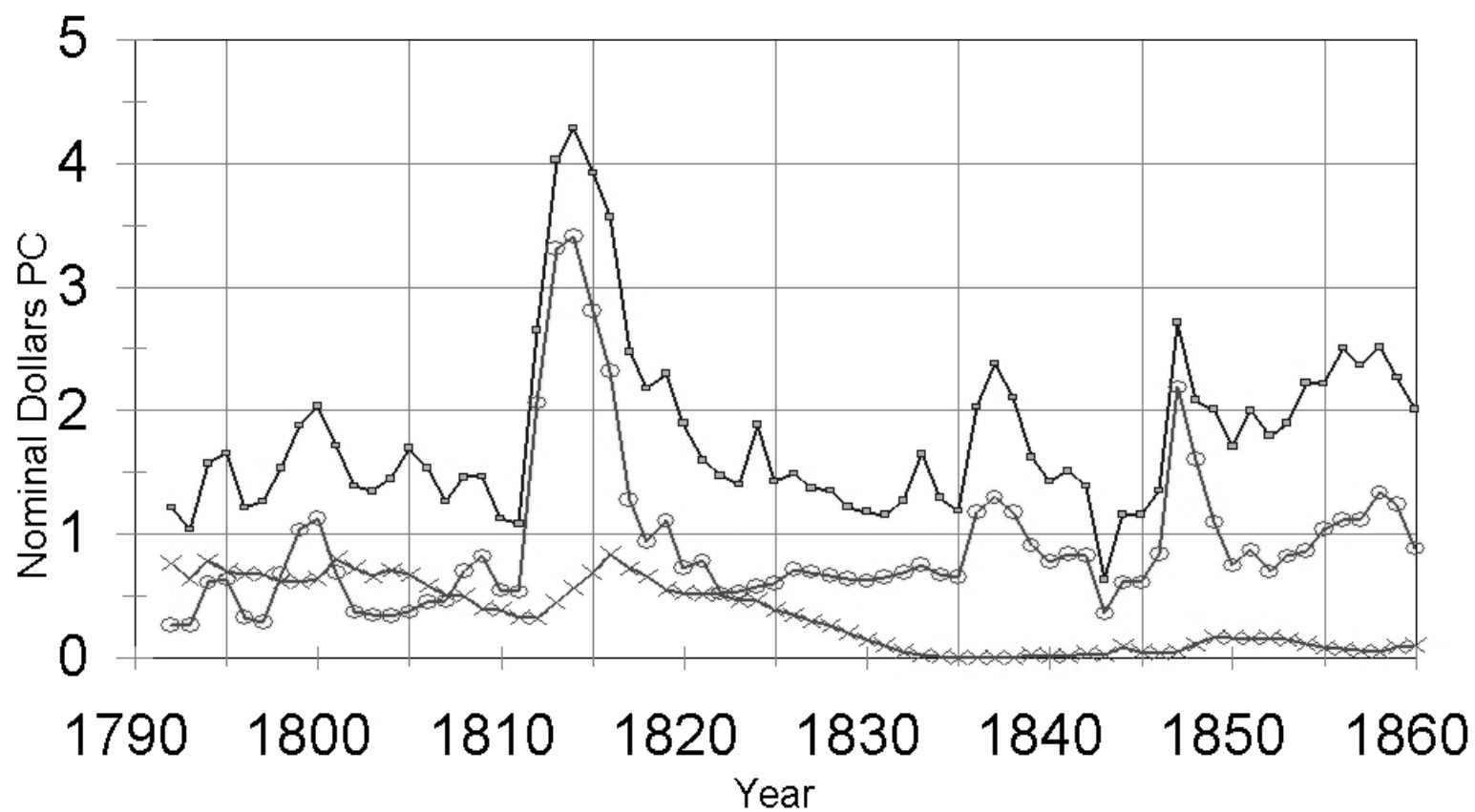


Figure 6

Federal Expenditures Per Capita

Nominal Dollars

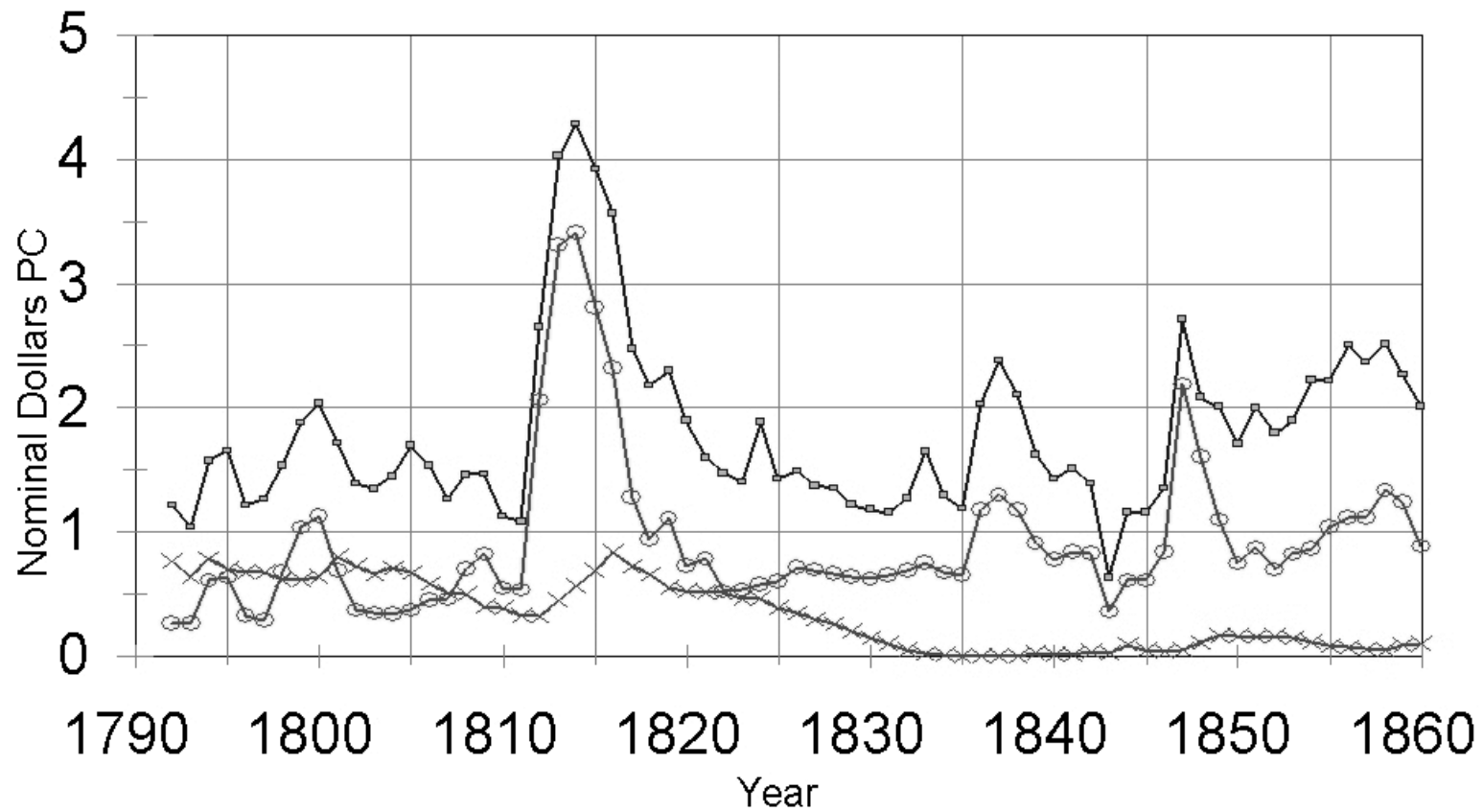


—□— Total —○— Defense —×— Interest

Figure 6

Federal Expenditures Per Capita

Nominal Dollars



—□— Total —○— Defense —×— Interest

Figure 7 **Federal Government Revenues Per Capita**
nominal values

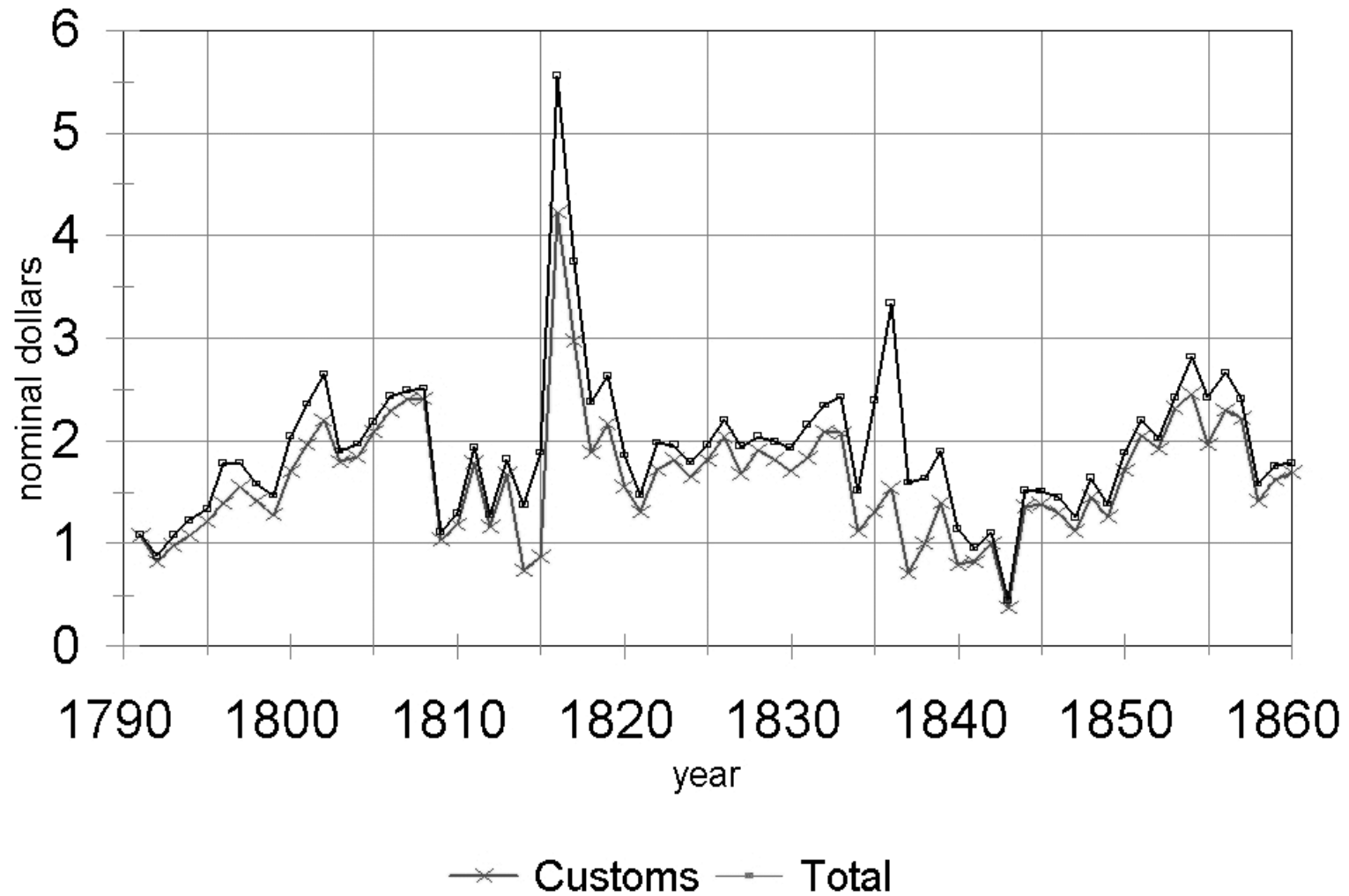
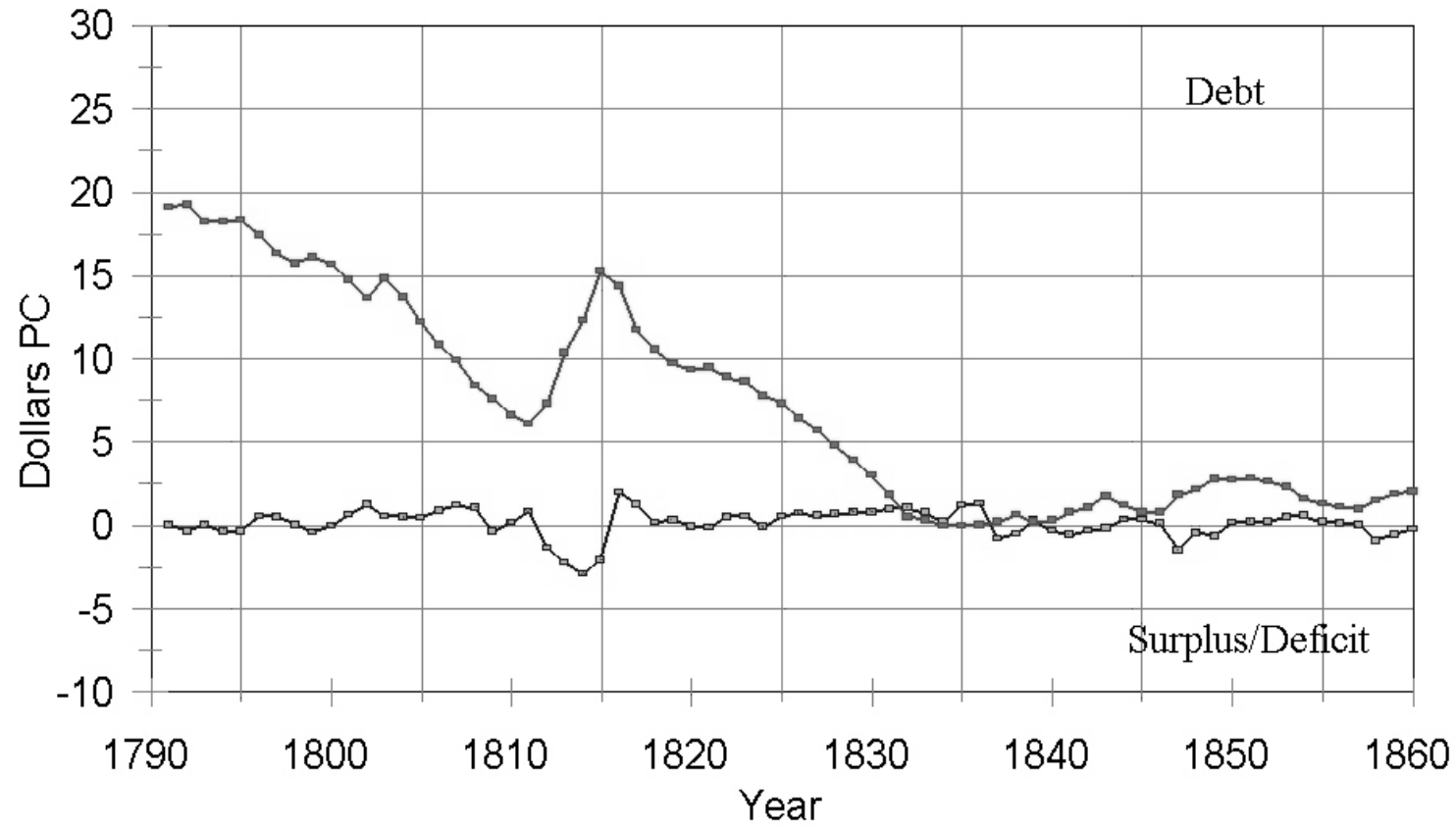


Figure 8

Federal Debts and Deficits

Nominal Dollars per Capita

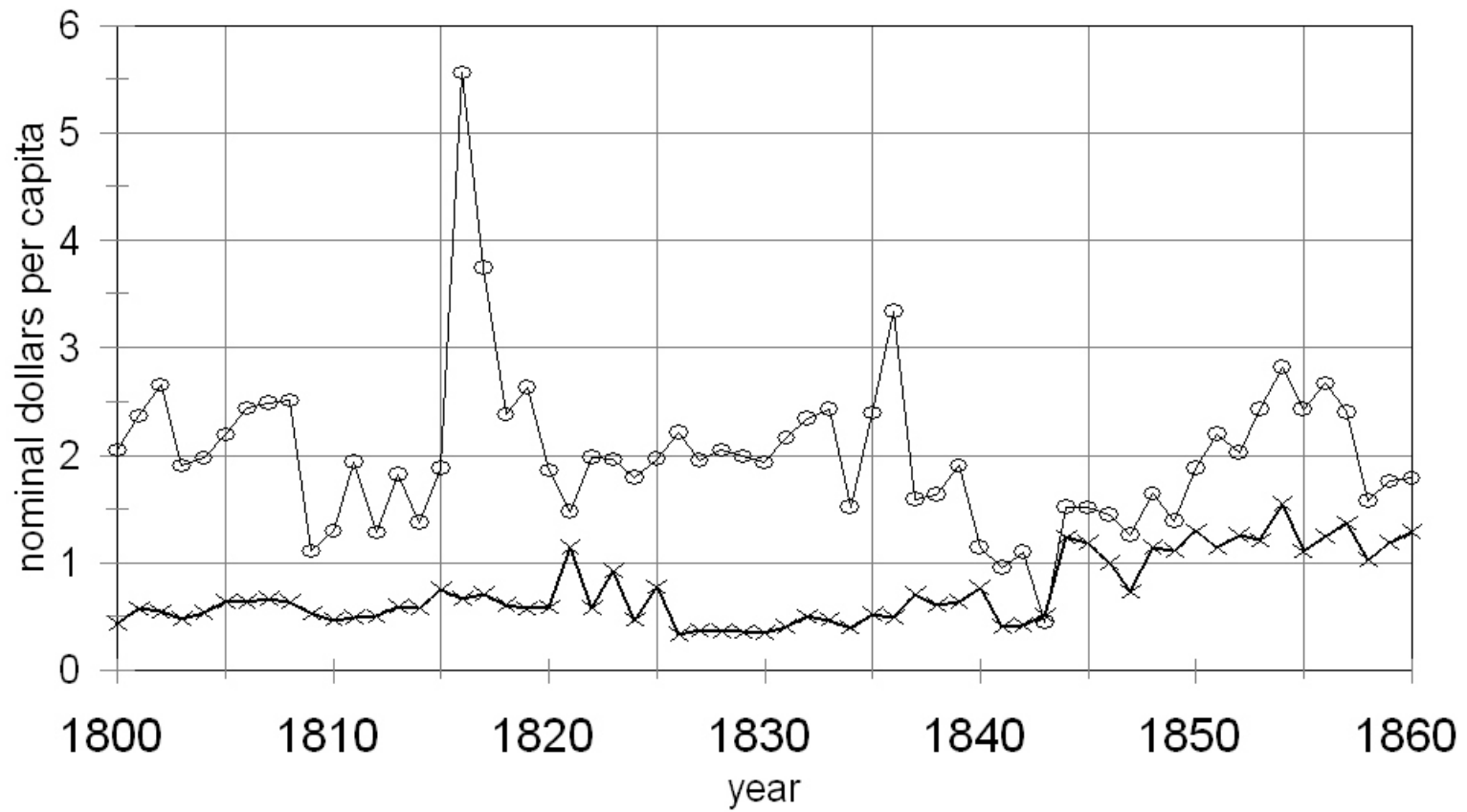


— Surplus — Debt

Figure 9

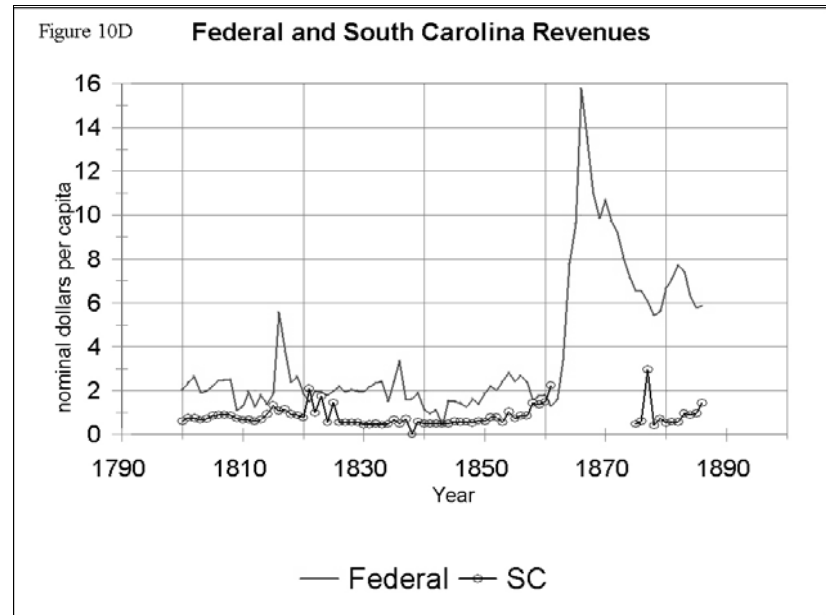
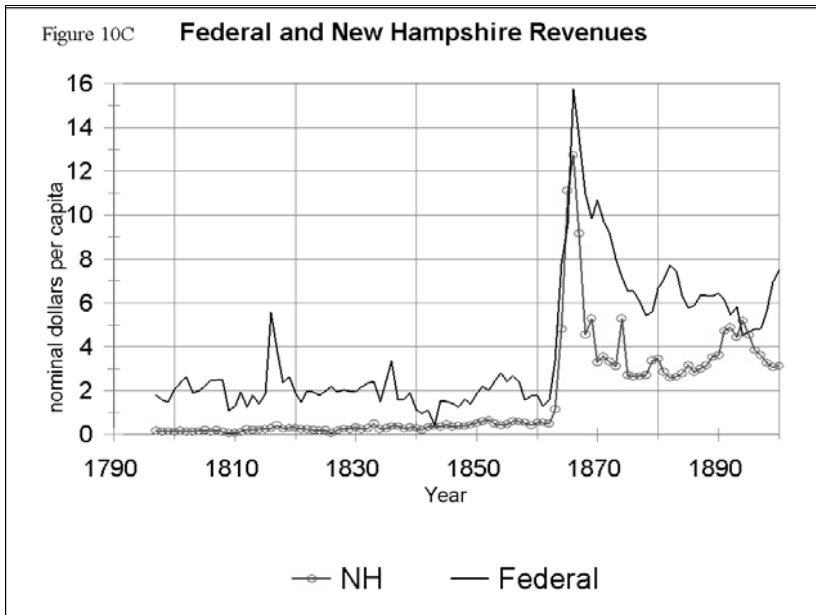
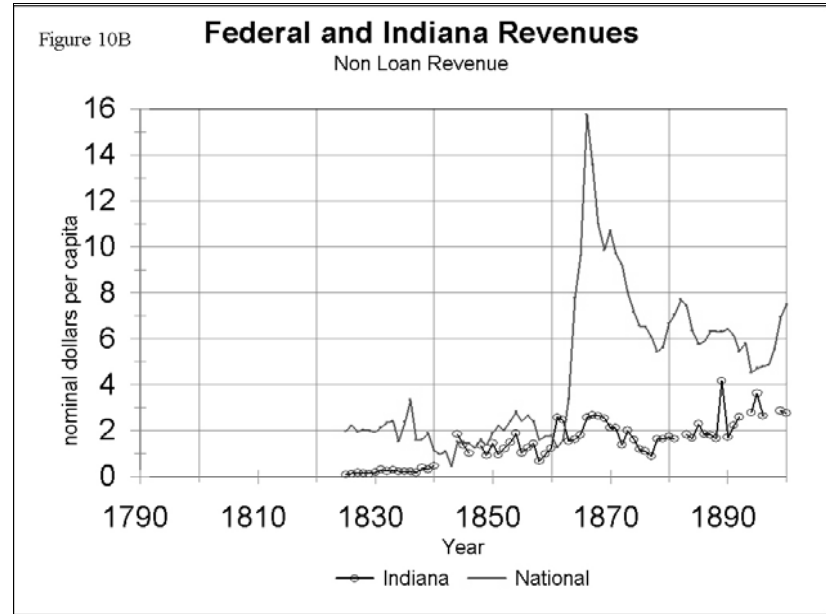
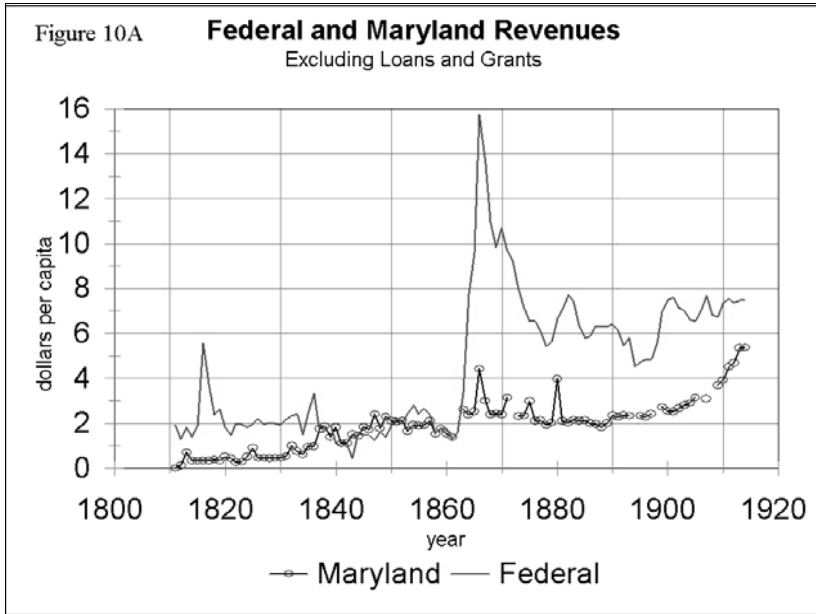
Federal and State Per Capita Revenues

MD, NH, SC, and IN average



—○— Federal

—×— Average State



Tariff Rates

Figure 11

As a share of dutiable value

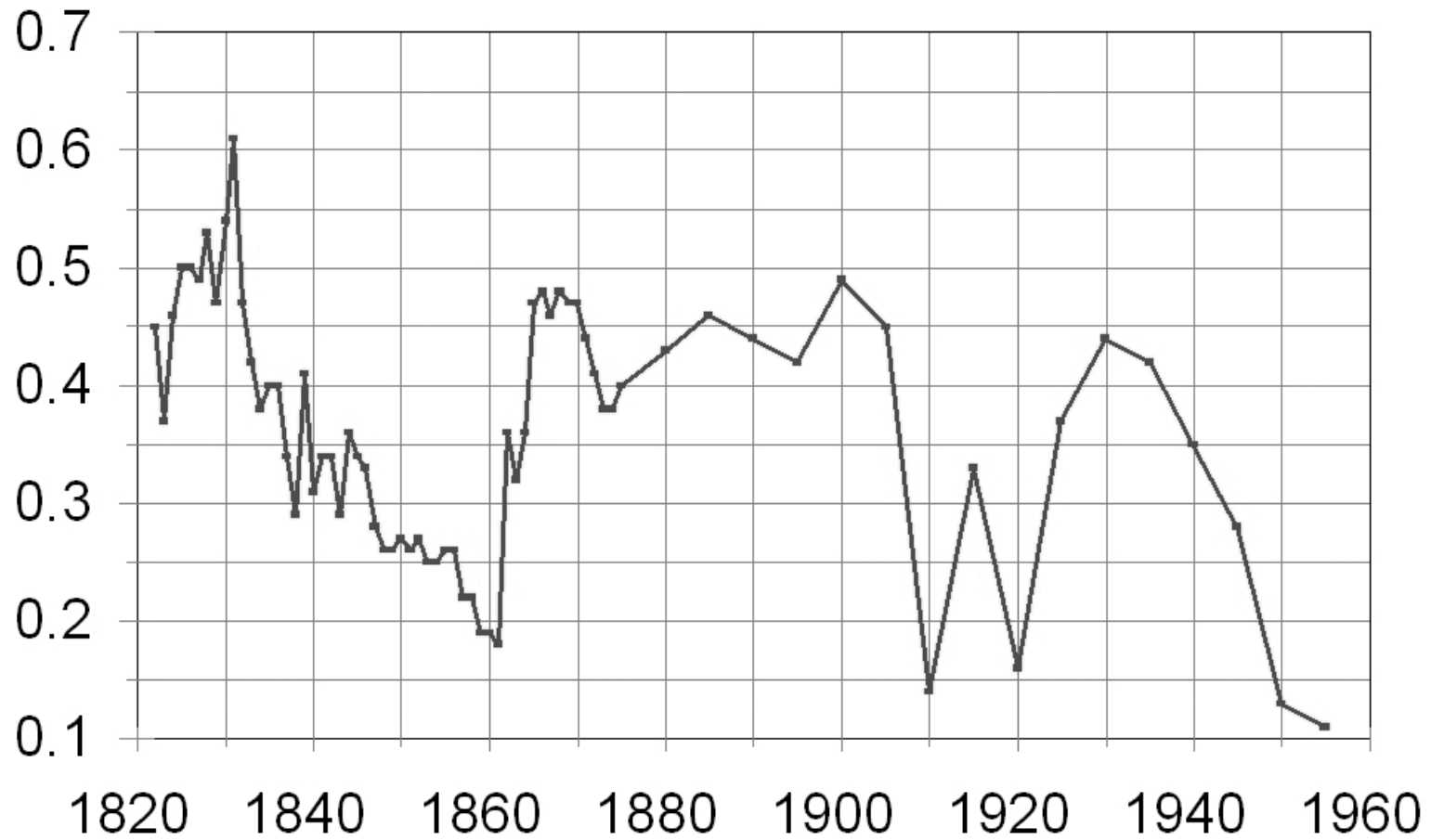
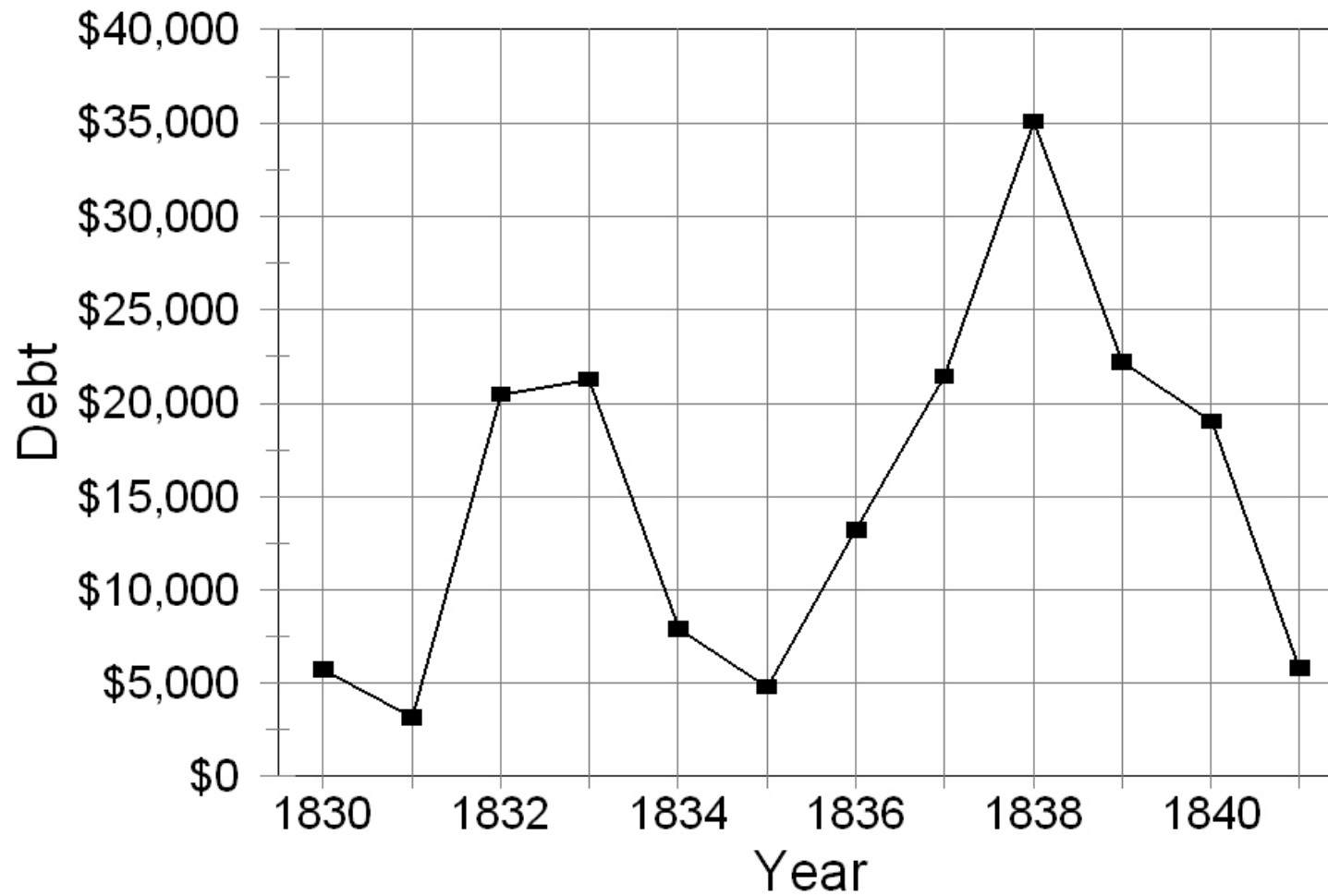


Figure 12

Debt Authorized by Year (thousands of \$)



Federal-Aid Highway Act of 1956:

CREATING THE INTERSTATE SYSTEM

by Richard F. Weingroff



An average of 196,425 vehicles per day roll over this section of the Capital Beltway, shown in the mid-1960s. (This statistic is from traffic counts in 1994.)

"Together, the united forces of our communication and transportation systems are dynamic elements in the very name we bear - United States. Without them, we would be a mere alliance of many separate parts."

- President Dwight D. Eisenhower, Feb. 22, 1955

By the late 1930s, the pressure for construction of transcontinental superhighways was building. It even reached the White House, where President Franklin D. Roosevelt repeatedly expressed interest in construction of a network of toll superhighways as a way of providing more jobs for people out of work.

He thought three east-west and three north south routes would be sufficient. Congress, too, decided to explore the concept. The Federal-Aid Highway Act of 1938 directed the chief of the Bureau of Public Roads (BPR) to study the feasibility of a six route toll network. The resultant two-part report, *Toll Roads and Free Roads*, was based on the statewide highway planning surveys and analysis.

Part I of the report asserted that the amount of transcontinental traffic was insufficient to support a network of toll superhighways. Some routes could be self-supporting as toll roads, but most highways in a national toll network would not.

Part II, "A Master Plan for Free Highway Development," recommended a 43,000-kilometer (km) nontoll interregional highway network. The interregional highways would follow existing roads wherever possible (thereby preserving the investment in earlier stages of improvement). More than two lanes of traffic would be provided where traffic exceeds 2,000 vehicles per day, while access would be limited where entering vehicles would harm the freedom of movement of the main stream of traffic.

Within the large cities, the routes should be depressed or elevated, with the former preferable. Limited-access belt lines were needed for traffic wishing to bypass the city and to link radial expressways directed toward the center of the city. Inner belts surrounding the central business district would link the radial expressways while providing a way around the district for vehicles not destined for it.

On April 27, 1939, Roosevelt transmitted the report to Congress. He recommended that Congress consider action on:

[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.



Model of a six-lane divided highway shown at the New York World's Fair in 1939 to illustrate the method of making highways safer by separating both railroad and highway grade crossings.

The president's political opponents considered the "master plan" to be "another ascent into the stratosphere of New Deal jitterbug economics," as one critic put it. Overall, however, reaction was favorable within the highway community although some observers thought the plan lacked the vision evident in the popular "Futurama" exhibit at the 1939 New York World's Fair.

The exhibit's designer, Norman Bel Geddes, imagined the road network of 1960 - 14-lane superhighways crisscrossing the nation, with vehicles moving at speeds as high as 160 km per hour. Radio beams in the cars regulated the spacing between them to ensure safety. In the cities, traffic moved on several levels - the lowest for service, such as pulling into parking lots, the highest for through traffic moving 80 km per hour. Although the "magic motorways" shown in Futurama were beyond the technological and financial means of the period, they helped popularize the concept of interstate highways.

With America on the verge of joining the war under way in Europe, the time for a massive highway program had not arrived. However, the president was already thinking about the post-war period. He feared resumption of the Depression if American soldiers returned from the war and were unable to find jobs. A major highway program could be part of the answer. On April 14, 1941, the president appointed a National Interregional Highway Committee to investigate the need for a limited system of national highways. Thomas H. MacDonald, BPR chief, chaired the committee and appointed Herbert S. Fairbank, BPR's Information Division chief, as secretary.

Interregional Highways, written by Fairbank and released on Jan. 14, 1943, refined the concepts introduced in Part II of *Toll Roads and Free Roads*. The new report recommended an interregional highway system of 63,000 km, designed to accommodate traffic 20 years from the date of construction.

The report went into detail on urban freeways. MacDonald and Fairbank were convinced that these freeways would exert a powerful force on the shape of the future city. It was important, therefore, for the network to be located so as to "promote a desirable urban development." As consideration of the Federal-Aid Highway Act of 1944 began, the highway community was divided. Rival apportionment formulas divided the states. Urban interests battled rural interests for priority. And states sought increased authority from the federal government. The result of these

disagreements was an inability to agree on the major changes needed in the post-war era to address accumulated highway needs. The Federal-Aid Highway Act of 1944 primarily maintained the status quo. Its biggest departure was in Section 7, which authorized designation of a 65,000-km "National System of Interstate Highways," to be selected by joint action of the state highway departments:

... 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.

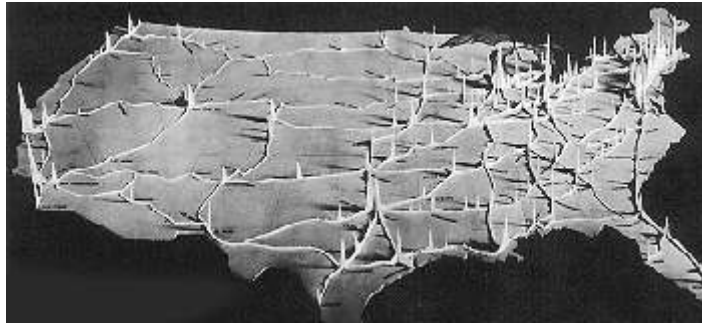


Illustration of peak traffic volumes based on statewide planning surveys of the 1930s.

Although Section 7 authorized the interstate system, it included no special provisions to give the interstate highways a priority based on their national importance. Section 7 did not authorize special funding, increase the federal share, or make a federal commitment to construct the system.



Early freeway in Newton, Mass., circa 1935, showing access control.

The Public Roads Administration (PRA), as the BPR was now called, moved quickly to implement Section 7. It called on the states to submit recommendations on which routes should be included in the interstate system. PRA also began working with state and local officials to develop interstate plans for the larger cities. In addition, PRA worked with the American Association of State Highway Officials (AASHO) to develop design standards for the interstate system.



Artist's conception of an interstate highway with at-grade crossings on a four-lane highway designed in conformity with the standards approved in 1945.

These standards, approved Aug. 1, 1945, did not call for a uniform design for the entire system, but rather for uniformity where conditions such as traffic, population density, topography, and other factors were similar. Designs, which would be based on traffic expected 20 years from the date of construction, would be adjusted to conditions. Most segments would have at least four lanes and full control of access would be provided where permitted by state law. But two-lane segments, limited access control, and at-grade railroad and highway crossings would be permitted where warranted by low traffic volumes.

On Aug. 2, 1947, PRA announced designation of the first 60,640 km of interstate highways, including 4,638 km of urban thoroughfares. PRA reserved 3,732 km for additional urban circumferential and distributing routes that would be designated later.

Construction of the interstate system moved slowly. Many states did not wish to divert federal-aid funds from local needs. Others complained that the standards were too high. Some of the heavily populated states, finding that federal-aid funding was so small in comparison with need, decided to authorize construction of toll roads in the interstate corridors. Also, by July 1950, the United States was again at war, this time in Korea, and the focus of the highway program shifted from civilian to military needs.

The Federal-Aid Highway Act of 1952 authorized \$25 million for the interstate system on a 50-50 matching basis. These were the first funds authorized specifically for interstate construction. However, it was a token amount, reflecting the continuing disagreements within the highway community rather than the national importance of the system.

When President Dwight D. Eisenhower took office in January 1953, the states had completed 10,327 km of system improvements at a cost of \$955 million - half of which came from the federal government. According to BPR, as it was again called, only 24 percent of interstate roadway was adequate for present traffic; that is, very little of the distance had been reconstructed to meet traffic expected 20 years hence.

Long before taking office, Eisenhower recognized the importance of highways.



Lt. Col. Dwight D. Eisenhower (left) and Maj. Sereno Brett, in Wyoming, on the U.S. Army's first transcontinental motor convoy in 1919.

Photo: Courtesy of the Eisenhower Library

His first realization of the value of good highways occurred in 1919, when he participated in the U.S. Army's first transcontinental motor convoy from Washington, D.C., to San Francisco. When Eisenhower and a friend heard about the convoy, they volunteered to go along as observers, "partly for a lark and partly to learn," as he later recalled. On the way west, the convoy experienced all the woes known to motorists and then some - an endless series of mechanical difficulties; vehicles stuck in mud or sand; trucks and other equipment crashing through wooden bridges; roads as slippery as ice or dusty or the consistency of "gumbo"; extremes of weather from desert heat to Rocky Mountain freezing; and, for the soldiers, worst of all, speeches, speeches, and more speeches in every town along the way.

On Sept. 5, 1919, after 62 days on the road, the convoy reached San Francisco, where it was greeted with medals, a parade, and more speeches.

During World War II, Gen. Eisenhower saw the advantages Germany enjoyed because of the autobahn network. He also noted the enhanced mobility of the Allies when they fought their way into Germany.

These experiences shaped Eisenhower's views on highways. "The old convoy," he said, "had started me thinking about good, two-lane highways, but Germany had made me see the wisdom of broader ribbons across the land."

In 1953, the first year of the Eisenhower administration, the president had little time for highways. He was preoccupied with bringing an end to the war in Korea and helping the country get through the economic disruption of the post-war period.

However, 1954 was a year in which a new federal-aid highway act would be needed, and from the start, during the State of the Union Address on Jan. 7, Eisenhower made clear that he was ready to turn his attention to the nation's highway problems. He considered it important to "protect the vital interest of every citizen in a safe and adequate highway system." Having held extensive hearings in 1953, Congress was able to act quickly on the Federal-Aid Highway Act of 1954.

Again, however, Congress avoided radical departures that would alter the balance among competing interests. All the programs, including the interstate system, were funded at higher levels, so each of the interests was satisfied. The main controversy involved the apportionment of the funds. Heavily populated states and urban areas wanted population to be the main factor, while other states preferred land area and distance as factors.

The 1954 bill authorized \$175 million for the interstate system, to be used on a 60-40 matching ratio. The formula represented a compromise: one-half based on population and one-half based on the federal-aid primary formula (one-third on roadway distance, one-third on land area, and one-third on population).

During the signing ceremony at the White House on May 6, 1954, the president said, "This legislation is one effective forward step in meeting the accumulated needs." But he knew it was not a big enough step, and he decided to do something about it.

Eisenhower planned to address a conference of state governors in Bolton Landing on Lake George, N.Y., July 12, 1954. Because of the death of his sister-in-law, the president was unable to attend, and Vice President Richard M. Nixon delivered the message from detailed notes the president had prepared.

Nixon told the governors that the increased funding authorized earlier that year was "a good start" but "a \$50 billion highway program in 10 years is a goal toward which we can - and we should - look." Such a program, over and above the regular federal-aid program, was needed because "... our highway network is inadequate locally, and obsolete as a national system."

The vice president read the president's recollection of his 1919 convoy, then cited five "penalties" of the nation's obsolete highway network: the annual death and injury toll, the waste of billions of dollars in detours and traffic jams, the clogging of the nation's courts with highway-related suits, the inefficiency in the transportation of goods, and "the appalling inadequacies to meet the demands of catastrophe or defense, should an atomic war come."

What was needed, the president believed, was a grand plan for a properly articulated system of highways. The president wanted a self-liquidating method of financing that would avoid debt. He wanted a cooperative alliance between state and federal officials to accomplish the federal part of the grand plan. And he wanted the federal government to cooperate with the states to develop a modern state highway system.

Finally, the vice president read the last sentence of the president's notes, in which he asked the governors to study the matter and recommend the cooperative action needed to meet these goals.

The speech, according to a contemporary observer, had an "electrifying effect" on the conference. It had come as a complete surprise, without the advance work that usually precedes major presidential statements. Furthermore, the speech was delivered at a time when the governors were again debating how to convince the federal government to stop collecting gas taxes so the states could pick up the revenue. Some governors even argued that the federal government should get out of the highway business altogether.

Within the administration, the president placed primary responsibility for developing a financing mechanism for the grand plan on retired Gen. Lucius D. Clay, an engineer and a long-time associate and advisor to the president. At the time, Clay was chairman of the board of the Continental Can Company. The President's Advisory Committee on a National Highway Program, commonly called the "Clay Committee," included Steve Bechtel of Bechtel Corporation, Sloan Colt of Bankers' Trust Company, Bill Roberts of Allis-Chalmers Manufacturing Company, and Dave Beck of the International Brotherhood of Teamsters.

[Francis C. \(Frank\) Turner](#) of BPR was appointed to serve as the advisory committee's executive secretary. Turner was an excellent choice because, unlike the members of the Clay Committee, he had direct knowledge of highway finance and construction, gained through a career that began when he joined BPR in 1929. He also had a direct link to the data resources of BPR.

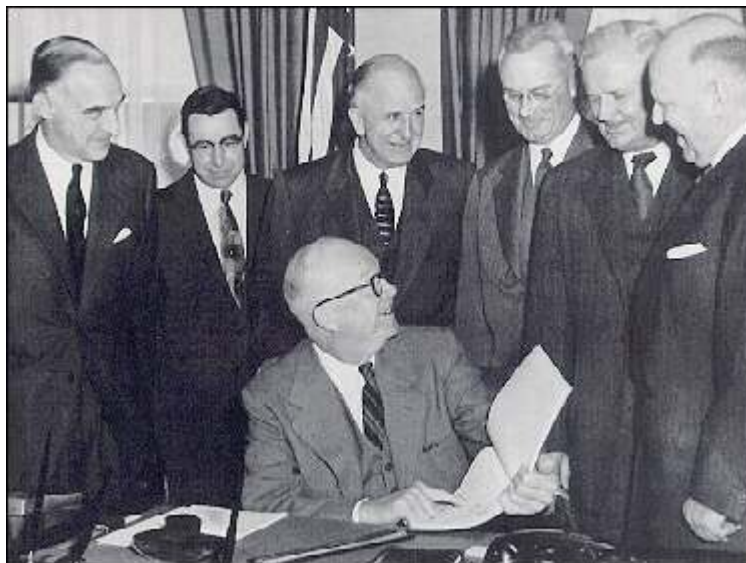
Gen. Clay and his committee members quickly found themselves confronted with the usual range of alternatives - from inside and outside the administration - that had bedeviled debates on the National System of Interstate Highways from the start.

By the end of the year, however, the Clay Committee and the governors found themselves in general agreement on the outline of the needed program. The governors had concluded that, as a practical matter, they could not get the federal government out of the gas tax business. Instead, they submitted proposals that, among other things, would keep state matching requirements at about current levels.

Based on BPR data, the Clay Committee's report estimated that highway needs totaled \$101 billion. The governors' report had indicated that the federal share of total needs should be about 30 percent, including the federal share of the cost of the interstate system. BPR estimated that the cost of modernizing the designated 60,670 km in 10 years would be \$23 billion.

The committee made a rough estimate of \$4 billion for the urban roads that had not yet been designated. This figure, \$27 billion, was accepted by all parties as the goal of any plan for financing the interstate highways. Because the interstate system "is preponderantly national in scope and function," the report recommended that the federal government pay most of the cost of its construction. The state and local share would be about \$2 billion.

To finance the system, the Clay Committee proposed creation of a Federal Highway Corporation that would issue bonds worth \$25 billion. Revenue from gas taxes would be dedicated to retiring the bonds over 30 years. Because traffic would continue to increase during that period, revenue would also go up, and a hike in the gas tax would not be necessary.



The Clay Committee presents its report with recommendations concerning the financing of a national interstate highway network to President Eisenhower on Jan. 11, 1955. Standing behind the president are (from left) Gen. Lucius Clay, Frank Turner, Steve Betchel, Sloan Colt, William Roberts, and Dave Beck.

Eisenhower forwarded the Clay Committee's report to Congress on Feb. 22, 1955. In his transmittal letter, he acknowledged the "varieties of proposals which must be resolved into a national highway pattern," and he wrote that the Clay Committee's proposal would "provide a solid foundation for a sound program." Furthermore, he said:

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 throughout the republic is matched by individual and commercial movement over a vast system of interconnected highways crisscrossing the country and joining at our national borders with friendly neighbors to the north and south.

Together, the united forces of our communication and transportation systems are dynamic elements in the very name we bear - United States. Without them, we would be a mere alliance of many separate parts.

Even before the President transmitted the report to Congress, [Sen. Albert Gore Sr.](#) of Tennessee, chairman of the Subcommittee on Roads in the Committee on Public Works, introduced his own bill. As modified before going to the Senate for consideration, the Gore bill proposed to continue the federal-aid highway program, but with \$10 billion for the interstate system through fiscal year (FY) 1961. The limitation would be increased to 68,400 km, and the federal share for interstate projects would be 75 percent.

One of the biggest obstacles to the Clay Committee's plan was Sen. Harry Flood Byrd of Virginia, chairman of the Committee on Finance that would have to consider the financing mechanisms for the program. Byrd never wavered in his opposition to bond financing for the grand plan. He was a pay-as-you-go man, who was described by biographer Alden Hatch as having "an almost pathological abhorrence for borrowing that went beyond reason to the realm of deep emotion." Byrd objected to restricting gas tax revenue for 30 years to pay off the debt. He objected to paying \$12 billion in interest on the bonds. He objected to the fact that the corporation's debt would be outside the public debt and beyond congressional control. He also objected to other features of the Clay Committee's proposal, including the proposal to provide credit - a windfall - for toll roads and toll-free segments already built.

By contrast, the Gore bill had many positive elements, but it had one glaring deficiency. Because the U.S. Constitution specifies that revenue legislation must originate in the House of Representatives, the Gore bill was silent on how the revenue it authorized would be raised. The House Ways and Means Committee would have to fill in the details.

On May 25, 1955, the Senate defeated the Clay Committee's plan by a vote of 60 to 31. The Senate then approved the Gore bill by a voice vote that reflected overwhelming support, despite objections to the absence of a financing plan.

[Rep. George H. Fallon](#) of Baltimore, Md., chairman of the Subcommittee on Roads in the House Committee on Public Works, knew that even if the House approved the Clay Committee plan, it would stand little chance of surviving a House-Senate conference. He, therefore, drafted a new bill with the help of data supplied by Frank Turner.

Through a cooperative arrangement with the Ways and Means Committee, Fallon's bill included highway user tax increases with the revenue informally committed to the program. The interstate system would be funded through FY 1968 with a federal share of 90 percent. Because of the significance of the interstate system to national defense, Fallon changed the official name to the "National System of Interstate and Defense Highways." This new name remained in all future House versions and was adopted in 1956.

By a vote of 221 to 193, the House defeated the Clay Committee's plan on July 27, 1955. That was not a surprise. What was a surprise was that Fallon's bill, as modified in committee, was defeated also. It lost by an even more lopsided vote of 292 to 123. Most observers blamed the defeat of the Fallon bill on an intense lobbying campaign by trucking, petroleum, and tire interests. Speaker of the House Sam Rayburn told reporters, "The people who were going to have to pay for these roads put on a propaganda campaign that killed the bill."

Congress adjourned a few days later, ending consideration of the highway program for the year. On Jan. 5, 1956, in his State of the Union Address, the president renewed his call for a "modern, interstate highway system." At first glance, prospects for bipartisan agreement on the highway program seemed slim in 1956, a presidential election year. But changes had been occurring that would turn the situation around in 1956.

One of the important changes was BPR's designation of the remaining 3,500 km of the interstate system, all of it in urban areas, in September 1955. BPR also published *General Location of National System of Interstate Highways*, which became known as "The Yellow Book" because of the color of its cover.

It contained a map of the interstate system as designated in August 1947 plus maps of 100 urban areas showing where designated interstate roadway would be located. A copy of The Yellow Book was provided to each member of Congress as a way of emphasizing the importance of the interstate system to the nation's urban areas.

At the same time, the highway interests that had killed the Fallon bill in 1955 were reassessing their views and clarifying their concerns. One important change, for example, occurred when trucking industry representatives indicated they were not opposed to all tax increases, only to the tax increases proposed in the Fallon bill, which they thought made them bear an unfair share of the load. They would agree to a one or two-cent hike in gas taxes and increases in certain other taxes.

Other groups that had assumed the Fallon bill would pass and had, therefore, not actively lobbied Congress in support of the bill, increased their efforts in support of legislation in 1956. Because the Senate had approved the Gore bill in 1955, the action remained in the House. Fallon introduced a revised bill, the Federal Highway Act of 1956, on Jan. 26, 1956. It provided for a 65,000-km national system of interstate and defense highways to be built over 13 years. The federal share would be 90 percent or \$24.8 billion. Increased funding would be provided for the other federal-aid highway systems as well.

Interstate funds would be apportioned on a cost-to-complete basis; that is, the funds would be distributed in the ratio which each state's estimated cost of completing the system bears to the total cost of completing the system in all states. The ratio would be determined on the basis of cost estimates prepared by BPR.

The 1956 Fallon bill would be financed on a pay-as-you-go basis, but the details had not yet been worked out by the House Ways and Means Committee. However, even before the details were announced, the president endorsed the pay-as-you-go method on Jan. 31, 1956, thereby recognizing that the Clay Committee's plan was dead. Years later, Eisenhower would recall:

Though I originally preferred a system of self-financing toll highways, and though I endorsed General Clay's recommendations, I grew restless with the quibbling over methods of financing. I wanted the job done.

On March 19, the House Ways and Means Committee reported out a bill, developed by [Rep. Hale Boggs](#) of Louisiana, that contained the financing mechanism. The Highway Revenue Act of 1956 proposed to increase the gas tax from two to three cents per gallon and to impose a series of other highway user tax changes. Acting on a suggestion by Secretary of Treasury George Humphrey, Rep. Boggs included a provision that credited a revenue from highway user taxes to a [Highway Trust Fund](#) to be used for the highway program.

The Committee on Public Works combined the Fallon and Boggs bills as Title I and Title II, respectively, of a single bill that was introduced on April 21. On April 27, the Federal Highway Act of 1956 passed the House by a vote of 388 to 19.

The bill was sent to the Senate, which referred the two titles to different committees for consideration. The Public Works Committee removed the program portion of the House bill and substituted the Gore bill with some changes.

Two major changes were that, like the Fallon bill, the new version established a 13-year program for completing the interstate system and the 1956 version adopted the funding level and the 90-10 matching ratio approved by the House. A key difference with the House bill was the method of apportioning interstate funds; the Gore bill would apportion two-thirds of the funds based on population, one-sixth on land area, and one-sixth on roadway distance.

Byrd's Committee on Finance largely accepted the Boggs bill as the financing mechanism for the interstate system and the federal-aid highway program. Byrd responded to a concern expressed by the secretary of the treasury that funding levels might exceed revenue by inserting what has since become known as the Byrd Amendment. It provided that if the secretary of the treasury determines that the balance in the Highway Trust Fund will not be enough to meet required highway expenditures, the secretary of commerce is to reduce the apportionments to each of the states on a pro rata basis to eliminate this estimated deficiency.

On May 28 and 29, the Senate debated the Federal-Aid Highway Act of 1956 before approving it by a voice vote. The House and Senate versions now went to a House-Senate conference to resolve the differences. The conference was difficult as participants attempted to preserve as much of their own bill as possible. On June 25, the conferees completed their work. The Federal-Aid Highway Act of 1956 that emerged from the House-Senate conference committee included features of the Gore and Fallon bills, as well as compromises on other provisions from both.



BPR officials in 1966 celebrate the 50th anniversary of the Federal Aid Road Act of 1916, which launched the federal-aid highway program.

From left to right: former Director of Administration James C. Allen, former BPR Commissioner Charles "Cap" Curtiss, Director of Planning E.H. "Ted" Holmes, Deputy Administrator Lawrence Jones, Administrator Rex Whitton (cutting cake), Director of Engineering and Operations George M. Williams, and Chief Engineer Francis C. Turner.

The interstate system was expanded, but only by 1,600 km to 66,000 km. To construct the network, \$25 billion was authorized for FYs 1957 through 1969. During the first three years, the funds would be apportioned as provided for in the Gore bill (mileage, land area, and population). In succeeding years, apportionments would be made on the cost-to-complete basis provided for in the Fallon bill. The added 1,600 km were excluded from the estimate. The federal share of project costs would be 90 percent.

The 1956 act called for uniform interstate design standards to accommodate traffic forecast for 1975 (modified in later legislation to traffic forecast in 20 years). BPR would work with AASHO to

develop minimum standards that would ensure uniformity of design, full control of access, and elimination of highway and railroad-highway grade crossings.

Two lane segments, as well as at-grade intersections, were permitted on lightly traveled segments. (However, legislation passed in 1966 required all parts of the interstate highway system to be at least four lanes with no at-grade intersections regardless of traffic volume.) Access would be limited to interchanges approved as part of the original design or subsequently approved by the secretary of commerce. Service stations and other commercial establishments were prohibited from the interstate right-of-way, in contrast to the franchise system used on toll roads.

The act prohibited the secretary from apportioning funds to any state permitting excessively large vehicles - those greater in size or weight than the limits specified in the latest AASHO policy or those legally permitted in a state on July 1, 1956, whichever were greater - to use the interstate highways. In addition, the secretary was directed to conduct a study of highway costs and of how much each class pays toward those costs in relation to the cost attributable to it.

Federal-aid funds could be used to advance acquisition of right-of way. Because some states did not yet have the authority to legally acquire control of access, the secretary could, at the request of a state, acquire the right-of-way and convey title to the state.

Toll roads, bridges, and tunnels could be included in the system if they met system standards and their inclusion promoted development of an integrated system. This provision avoided the costly alternative of constructing toll-free interstate routes in corridors already occupied by turnpikes. The 1956 act deferred a decision on the controversial issue of whether to reimburse states for turnpikes and toll-free segments built with less than 90-percent interstate funding or no funding. Instead, the secretary was directed to study the issue and report to Congress. (Congress did not approve reimbursement until the passage of the Intermodal Surface Transportation Efficiency Act of 1991.)

The 1956 act also resolved one of the most controversial issues by applying the Davis-Bacon Act to interstate construction projects, despite concerns that the cost of the projects would be increased. The Davis Bacon Act, which had been enacted in the 1930s, required that federal construction projects pay no less than the prevailing wages in the immediate locality of the project. It had not previously applied to federal-aid projects, which were state, not federal, projects.

On June 26, 1956, the Senate approved the bill by a vote of 89 to 1. (The one "no" vote was cast by Sen. Russell Long of Louisiana who opposed the gas tax increase.) That same day, the House approved the bill by a voice vote.

Earlier that month, Eisenhower had entered Walter Reed Army Medical Center after an attack of ileitis, an intestinal ailment. He was still in the hospital on June 29, when a stack of bills was brought in for signature. One of them was the Federal-Aid Highway Act of 1956, the landmark bill for which he had fought so hard. He signed it without ceremony or fanfare. White House Press Secretary James C. Hagerty told the press that the president "was highly pleased."

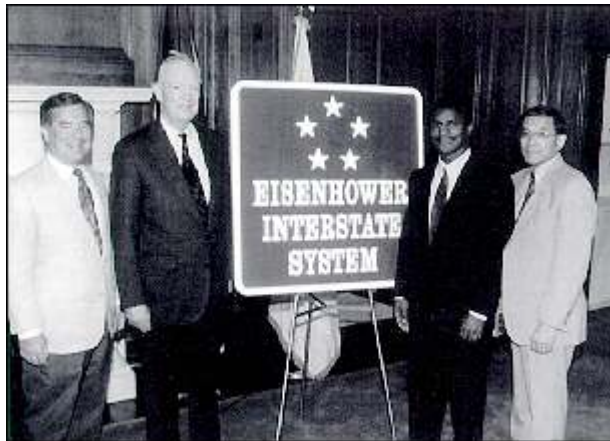


At the White House on Oct. 22, 1956, President Eisenhower holds the Bible as John A. Volpe (left) is sworn in as interim, and first, federal highway administrator. Frank K. Sanderson, White House administrative officer, administers the oath.

Secretary of Commerce Sinclair Weeks immediately announced the allocation of \$1.1 billion to the states for the first year of what he called "the greatest public works program in the history of the world."

To manage the program, Eisenhower chose Bertram D. Tallamy to head BPR, with the newly authorized title "Federal Highway Administrator." Tallamy, who was New York's superintendent of public works and chairman of the New York State Thruway Authority, would not be available until early 1957. John A. Volpe, who had been the commissioner of public works in Massachusetts for four years, served as interim administrator from Oct. 22 until Tallamy could take office in February 1957.

In August 1957, AASHO announced the numbering scheme for the interstate highways and unveiled the red, white, and blue interstate shield. Many of the states had submitted proposals for the shield, but the final version was a combination of designs submitted by Missouri and Texas. Administrator Tallamy approved the route marker and the numbering plan in September. And so, construction of the interstate system was under way.



Unveiling the Eisenhower Interstate System sign on July 29, 1993, are (from left): Rep. Nick Rahall (D-W.Va.), John Eisenhower (President Eisenhower's son), Federal Highway Administrator Rodney Slater, and Rep. Norman Mineta (D-Calif.).

In October 1990, President George Bush - whose father, Sen. Prescott Bush of Connecticut, had been a key supporter of the Clay Committee's plan in 1955 - signed legislation that changed the name of the system to the "Dwight D. Eisenhower System of Interstate and Defense Highways." This change acknowledged Eisenhower's pivotal role in launching the program. The key elements

that constituted the interstate highway program - the system approach, the design concept, the federal commitment, and the financing mechanism - all came together under his watchful eye. Biographer Stephen E. Ambrose stated, "Of all his domestic programs, Eisenhower's favorite by far was the Interstate System." Eisenhower's 1963 memoir, *Mandate for Change 1953-1956*, explained why:

More than any single action by the government since the end of the war, this one would change the face of America. ... 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.

The next 40 years would be filled with unexpected engineering challenges, unanticipated controversies, and unforeseen funding difficulties. Nevertheless, the president's view would prove correct. The interstate system, and the federal-state partnership that built it, changed the face of America.

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Richard F. Weingroff is an information liaison specialist in the Federal Highway Administration's Office of the Associate Administrator for Program Development.

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ARTICLES

DEPARTMENTS

[Guest Editorial](#)
[Along the Road](#)
[Internet Watch](#)
[Communication Product Updates](#)
[Training Update](#)
[Conferences/
Special Events Calendar](#)
[Previous Issues](#)
[Subscriptions](#)
[Public Roads Home](#)

March/April 2006

Essential to the National Interest

by Richard F. Weingroff

The first decade of the greatest public works project in history began a transportation system yet unrivaled in the world—along with problems to match.



The Bureau of Public Roads developed an exhibit in 1957—one of many over the years—to let the public know about the "controlled access Interstate System being built under the Federal-Aid Highway Act of 1956." Left to right, Robert M. Monahan, special assistant for public affairs; Federal Highway Administrator Bertram D. Tallamy; Harold C. Wood, Sr., of the Motion Picture and Exhibits Section; and Assistant Commissioner for Research E. H. "Ted" Holmes. The Bureau of Public Roads developed an exhibit in 1957—one of many over the years—to let the public know about the "controlled access Interstate System being built under the Federal-Aid Highway Act of 1956." Left to right, Robert M. Monahan, special assistant for public affairs; Federal Highway Administrator Bertram D. Tallamy; Harold C. Wood, Sr., of the Motion Picture and Exhibits Section; and Assistant Commissioner for Research E. H. "Ted" Holmes.

President Dwight D. Eisenhower understood the value of roads. In 1919 he was aboard the U.S. Army's first transcontinental convoy, a 2-month journey from Washington, DC, to San Francisco, CA, to assess the readiness of military vehicles to

make such a long trip and to promote good roads. The trip convinced the participants, which included military personnel, road advocates, and members of the press, of the country's need for better roads. During and after World War II, he traveled on Germany's Reichautobahnen network of rural superhighways, which were studied and envied by American engineers during the prewar 1930s. Eisenhower would say, "The old convoy had started me thinking about good, two-lane highways, but Germany had made me see the wisdom of broader ribbons across the land."

In 2006 the transportation community celebrates the 50th anniversary of the Eisenhower Interstate System. The second in a three-part series, this article examines the birth of the Interstate System, from the grand ideas to the day-to-day challenges of executing the country's largest public works project.

The Interstate Idea

The concept of the Interstate System was born in two reports to the U.S. Congress, *Toll Roads and Free Roads* (1939) and *Interregional Highways* (1944). The reports recommended construction of what the 1939 study called a "system of direct interregional highways, with all necessary connections through and around cities, designed to meet the requirements of the national defense in time of war and the needs of a growing peacetime traffic of longer range."

The Map That Started the Interstate System

In February 1938, President Franklin D. Roosevelt decided to discuss one of his pet ideas with Thomas H. MacDonald, head of BPR. At the White House, the President drew lines on a map of the United States where he thought a system of east-west and north-south transcontinental toll highways should be built. He asked MacDonald for a report on the idea.

Two months later MacDonald submitted *Proposed Direct Route Highways* to the White House. BPR found that "a national system of direct route highways designed for continuous flow of motor traffic, with all cross traffic on separated grades, is seriously needed and should be undertaken." BPR concluded that most sections would not carry enough traffic for toll revenue to liquidate bonds used to finance construction, but the report emphasized that "any expenditure actually required for the accommodation of the traffic on these highways will be more than repaid by the normal road-user taxes generated by their use."

Having heard about the internal study, Congress decided to seek a public report. The Federal-Aid Highway Act of 1938, which President Roosevelt approved in June 1938, asked BPR to submit a report on a toll network of no more than three east-west and three north-south "superhighways." *Toll Roads and Free Roads* would be an extensive study based on data from traffic surveys around the country. Again, the report rejected a toll network but proposed "a special, tentatively defined system of direct interregional highways, with all necessary connections through and around cities, designed to meet the requirements of the national defense in time of war and the needs of a growing peacetime traffic of longer range." President Roosevelt submitted the report to Congress in April 1939.

With enactment of the Federal-Aid Highway Act of 1956, what began as a few red lines drawn by President Roosevelt on a map almost 20 years earlier would become a system of direct interregional highways known as the Interstate System.

Congress agreed. The Federal-Aid Highway Act of 1944 directed designation of a 65,000-kilometer (40,000-mile) "National System of Interstate Highways" by joint action of State highway agencies, subject to approval by the U.S. Bureau of Public

Roads (BPR). In August 1947, Major General Philip B. Fleming, the Federal Works Administrator, and Commissioner of Public Roads Thomas H. MacDonald announced designation of 60,642 kilometers (37,681 miles) of principal highways, including 4,638 kilometers (2,882 miles) of urban thoroughfares carrying the main line through cities. The remaining 3,732 kilometers (2,319 miles) of the authorized mileage were reserved for circumferential and distributing routes. This process was completed when BPR released the publication *General Location of National System of Interstate Highways Including All Additional Routes at Urban Areas Designated in September 1955* (known as the "Yellow Book" because of the cover's color).

What was missing was a program to fund and build the Interstate System.

The "Grand Plan"

President Eisenhower's Grand Plan is sometimes misunderstood as simply recommending construction of the Interstate System. His vision was far grander than that.

The President intended to present the plan to the Governors' Conference meeting in upstate New York in July 1954. However, following the death of his sister-in-law, Eisenhower was unable to attend. Instead, he provided notes to Vice President Richard M. Nixon for delivery to the Governors.

The Grand Plan, Nixon explained, was that each level of Government—Federal, State, county, and municipal—would contribute to upgrading the Nation's entire road network over a 10-year period. The goal was "a properly articulated system that solves the problems of speedy, safe, transcontinental travel." The benefits would be improved safety, reduced traffic jams, less traffic-related litigation, increased economic efficiency, and elimination of "the appalling inadequacies to meet the demands of catastrophe or defense should an atomic war come."



President Dwight D. Eisenhower (seated) received the report A Ten-Year National Highway Program from his Advisory Committee on a National Highway Program (the Clay Committee). The report would provide the basis for the President's proposal to Congress on financing construction of the Interstate System. Left to right, General Lucius D. Clay (U.S. Army, retired), committee chairman; Francis C. "Frank" Turner of BPR, committee executive secretary; and members Steve Bechtel of Bechtel Corp.; Sloan Colt of Bankers' Trust Co.; Bill Roberts of Allis-Chalmers Manufacturing Co.; and Dave Beck of the International Brotherhood of Teamsters.

Finally, the Grand Plan included "very probably, a program initiated by the Federal Government, with State cooperation, for the planning and construction of a modern State highway system . . . to construct new, or modernize existing, highways." That was as close as Eisenhower came to mentioning the Interstate System in his Grand Plan speech.

Federal-Aid Highway Act of 1956

The President asked his friend and adviser General Lucius D. Clay to head a committee to develop a Federal response to the challenge. The resulting Clay Committee believed the Interstate System would cost \$27 billion, with \$23 billion of that for rural segments. In February 1955, Eisenhower submitted the committee's report to Congress along with legislative proposals. The Clay plan—which entailed \$25 billion in bonds and redirection of the gas tax—was a flop.

As Congress searched for an alternative financing plan in 1955, the highway-related interests that supported the Interstate System agreed on only one thing—they did not want to pay for it. Why, they asked, should only users pay for a highway network that would benefit the entire country? In July 1955, the Congress adjourned without completing action, mainly because of disagreement over financing.

Supporters realized they would have to compromise to get the highways they wanted. With tax compromises in place, the Federal-Aid Highway Act of 1956 moved through Congress with little controversy. It included a financing mechanism drafted by Representative Hale Boggs (D-LA) of the House Ways and Means Committee. At the suggestion of Secretary of the Treasury George Humphrey, Boggs used the Social Security Trust Fund as a model for the Highway Trust Fund. Revenue from taxes on highway user products would be credited to the highway fund for use exclusively on the Interstate System and other Federal-aid highway and bridge projects. The revised bill sailed through the Congress, which approved the bill on June 26.

Having fought for this bill, President Eisenhower would be denied a signing ceremony. He was at Walter Reed Army Medical Center following emergency surgery for an intestinal ailment. On June 29 he was given a stack of bills, including the highway act. Without fanfare, a photograph, or statement, he signed the legislation and was, according to Press Secretary James C. Hagerty, "highly pleased."

The legislation changed the name of the Interstate System to reflect its importance to national defense: The National System of Interstate and Defense Highways. It expanded the system by 1,609 kilometers (1,000 miles) to 65,983 kilometers (41,000 miles) and authorized \$25 billion to be made available in fiscal years (FY) 1957 through 1969 for construction to accommodate traffic demand in 1975. The Federal share of costs would be 90 percent.



Missouri Department of Transportation

Missouri claimed the first project on which actual construction began under the Federal-Aid Highway Act of 1956. A sign to that effect, shown here, was erected beside U.S. 40 (the future I-70) in St. Charles County.

The Firsts

The first project to go to construction under the new law was the Mark Twain Expressway portion of U.S. 40 (future I-70) in St. Charles County, MO. Construction on the \$1.87 million project, which included 5 kilometers (3.1 miles) of bridging, grading, and concrete paving leading to a new bridge over the Missouri River, began on August 13. The Missouri State Highway Commission placed a sign on the project declaring it to be the first on which "actual construction" was begun under the 1956 act.

On August 31, the Kansas State Highway Commission awarded a contract for concrete paving of a 12.9-kilometer (8-mile) section of U.S. 40 (I-70) outside Topeka. Construction had begun before enactment of the 1956 law, but under the new contract, paving began on September 26 with funds provided under the new program. Joined by BPR officials, First District State Highway Commissioner Ivan Wassberg marked the historic occasion by scratching "9-26-56" in the fresh concrete. On November 14, 1956, highway officials held a ribbon-cutting ceremony and posted a sign proclaiming the project to be the first completed under the 1956 act.

Off to a Flying Start

In July 1956, BPR and the American Association of State Highway Officials (AASHO), as it was called at the time, agreed on design standards for the Interstate System. Access would be controlled, with crossroads carried over or under the routes. The system would consist of divided highways with four or more 3.7-meter (12-foot) lanes. In sparsely settled rural areas where traffic volumes were low, the standards would be relaxed, with at-grade crossings permitted in some cases; two-lane sections with one lane in each direction would be built to one side of the right-of-way so additional lanes could be added when traffic warranted.

The highways would be designed for speeds of 80.5 kilometers per hour, km/h (50 miles per hour, mi/h) in mountain terrain, 96.6 km/h (60 mi/h) in rolling terrain, and 112.7 km/h (70 mi/h) in flat terrain. Bridges and overpasses would be built without overhead obstructions, but all structures would allow at least 4.3 meters (14 feet) of

vertical clearance over the roadways and shoulders.

To maintain the program's quick start, President Eisenhower believed that BPR would need a leader with the prestige of Presidential appointment and Senate confirmation as he worked with State highway leaders appointed by Governors. With the support of Senator Al Gore, Sr. (D-TN), Senator Prescott Bush (R-CT), and others, the Administration's proposal for a position of Federal Highway Administrator became law in August 1956. The Administrator would be a top adviser on highway policy and take charge of the Interstate program, while the Commissioner of Public Roads, Charles D. "Cap" Curtiss, would oversee day-to-day operations of BPR and its other programs.

President Eisenhower's choice was Bertram D. Tallamy, who had held several positions with the New York Public Works Department and helped create the New York State Thruway. But because Tallamy was unable to sever his New York connections until February 1957, the President appointed John A. Volpe, who had recently resigned as Massachusetts Commissioner of Public Works to return to the private sector, to serve as interim Administrator. Like Tallamy, Volpe was a seasoned veteran within the highway community, having started his own construction company with initial capital of \$300 and built it into a multimillion dollar contracting firm.

Thus, on October 22, 1956, Volpe became the first Federal Highway Administrator (although not confirmed by the Senate). At the White House ceremony, President Eisenhower said he wanted to make certain that the highway program got off to a "flying start." He held the Bible while Frank K. Sanderson, White House administrative officer, administered the oath of office to Volpe, the only Administrator whose swearing-in ceremony was attended by a President.

Volpe coordinated important decisions with Tallamy, and in his brief tenure, he reorganized BPR and delegated authority to field offices to handle the increased workload more efficiently. The States, he reported to the President on February 1, were moving forward aggressively; only five had not obligated any of their FY 1957 Federal funds. In submitting his resignation, Volpe said, "My 100 days in Washington have been exciting, challenging, busy, action-packed, and, I trust, productive."

On February 5, 1957, U.S. Secretary of Commerce Sinclair Weeks administered the oath of office to Tallamy, who was unanimously confirmed by the Senate. Tallamy understood the task he would oversee. As he told the Economic Club of Detroit in May, the 1956 act provided the highway community with "the greatest challenge that has ever been given to any peacetime public works agency." It was bigger, he said, "than the St. Lawrence Seaway, the Panama Canal, the Grand Coulee Dam, the Egyptian Pyramids, and a lot of other big projects . . . all rolled into one." Despite the scale of the project, he said, the highway community had only 13 to 16 years to complete the job.



Kansas claimed the first project completed under the 1956 highway law for a 12.9-kilometer (8-mile) section of U.S. 40 (I-70) west of Topeka. Here, four representatives of the engineering contractor and State highway commission mark the occasion on a windy day.

As the first year ended, BPR General Counsel Clifford W. Enfield said, "Perhaps the greatest advancement to be enjoyed by Americans during the 20th century may not come about because of nuclear energy, startling medical advances, or interplanetary communications, but by enactment of the Federal-Aid Highway Act of 1956." He added, "This legislation calls for environmental changes for the United States on a scale so staggering as to dwarf any prior peacetime endeavors of mankind."

Enfield called it "America's New Design for Living."

AASHO Road Test



The design of pavements and bridges on the Interstate System largely followed the results of a road test by the American Association of State Highway Officials

(AASHO).

The test site in Ottawa, IL, was financed by the State highway agencies, BPR, U.S. Department of Defense (DoD), Automobile Manufacturers Association, American Petroleum Institute, American Institute of Steel Construction, foreign countries, and U.S. materials and transportation associations. The Highway Research Board administered the project.

In August 1956 workers began constructing 11.3 kilometers (7 miles) of two-lane pavements in the form of six loops and a tangent (straight), half concrete and half asphalt. The 836 test sections employed a range of surface, base, and subbase thicknesses, and included 16 short-span bridges. Test traffic was inaugurated on October 15, 1958, with DoD providing drivers and heavy vehicles. The road test ended November 30, 1960.

The test data established the relationships for pavement structural designs based on expected loadings over the life of a pavement. Although the bridge findings were consistent with predictions, the road test provided the foundation for the analytical evaluation of stresses and deflections from moving vehicles.

The AASHO road test is a landmark in highway and bridge design. The straight portion of the track is now part of I-80 in Illinois.

Pivotal Year: 1957

The highway engineers who launched the Interstate System may, perhaps, be forgiven for thinking they would be part of one of the most popular programs in American history. Today, with the automobile long since a key part of the American way of life, traffic volumes increasing every year, congestion in cities sapping urban energy, suburban life spreading into exurban sprawl, and continuing concern about highway safety, the system's popularity may have decreased a bit. But in the 1950s, support for Interstates was widespread and bipartisan. During the debates in Congress in 1955 and 1956, no opposition was expressed whatsoever.

As the first fiscal year of the Interstate program ended in June 1957, Tallamy reported that based on engineering and economic studies, BPR had approved 80 percent of the locations within the original 65,000-kilometer (40,000-mile) limit. Further, State highway agencies completed improvements on 1,190 kilometers (737 miles) of the Interstate System at a total cost of \$173.3 million (Federal share: \$117.8 million). BPR added that planning and construction were "going on at a furious pace throughout the Nation."



On October 22, 1956, President Eisenhower holds the Bible as John A. Volpe (left) takes the oath of office as the first Federal Highway Administrator. White House Administrative Officer Frank Sanderson administers the oath. The President said he participated in the ceremony because he wanted to be sure the Interstate program got off to a "flying start."

But Tallamy acknowledged that problems had been encountered. For example, he noted that engineers and steel were in short supply. Indeed, throughout 1957, highway engineers would be buffeted by surprises, even shocks.

One of the problems was a requirement in the 1956 act that the States hold public hearings to consider the economic effects of the location if a Federal-aid highway project involved bypassing or going through a city, town, or village. Based on early experience, AASHO Executive Secretary A. E. "Alf" Johnson warned highway officials that the hearings required "the finest in public relations" and must present "factual data and logical reasons."

Right-of-way acquisition was another concern because so much of the Interstate System would be built on new locations. State highway agencies had rarely needed to acquire land or to do so by eminent domain. The States needed new legislation, standards, appraisers—and they needed them quickly. The first problems arose in Indiana, where speculators were buying land in the Interstate corridors to resell to the State at "preposterous profits," as *The Washington Post and Times-Herald* reported.

Perhaps the greatest shock of 1957 involved the urban routes, which—contrary to the estimate of requiring just \$4 billion of the total \$27 billion—would take about half the Interstate funds. From the earliest description of the Interstate System, in BPR's 1939 report to Congress *Toll Roads and Free Roads*, the goal was to use the new highways to invigorate blighted urban areas, reverse suburbanization, and restore city tax bases. To achieve these goals, BPR had used sampling techniques developed with the U.S. Census Bureau to conduct extensive urban origin-and-destination surveys and worked with State and local officials before designating the urban Interstates in 1955. BPR urged the States to concentrate on projects in urban areas because that was where the need for traffic relief was the greatest.

The highway community would find out how hard providing that traffic relief would be at a September 1957 conference in Hartford, CT, on the effect of highways on metropolitan areas. Tallamy, reinforcing statements by Administrator Albert M. Cole of the Housing and Home Financing Agency, told conference attendees that "we have the chance of a century to make our cities sparkle brightly among our Nation's brilliant collection of really wonderful cities." The Interstate System, he added, was "probably the greatest single tool" in reversing urban problems.

Tallamy recognized, however, that as soon as "a fine new highway project" is developed, "there will develop forces opposed to it." He was confident that those who criticized the program the most at the start would "probably be pushing the real supporters of the program in the background at the finish so they can cut the ribbons and take the credit they do not deserve."

The final speaker at the conference, nationally known author and social scientist Lewis Mumford, was skeptical, however. "We have good reason to be anxious," he said, since it was obvious "that neither of these Administrators had the slightest notion of what they were doing."

Signs of Progress

Although 1957 held serious controversy for the Interstate System, the year included considerable progress. AASHO and BPR, for example, applied the route numbers to the Interstate highways in September. They adapted the U.S. numbering plan for the system, but in mirror image. Where the lowest, odd-numbered, north-south U.S. route was on the East Coast (U.S. 1), the lowest, odd-numbered Interstate route would be on the West Coast (I-5). Similarly, the lowest, even-numbered east-west U.S. route ran along the Canadian border (U.S. 2), while the corresponding Interstate route was in the South (I-10).

The Interstate sign was unveiled at the same time. The States had submitted designs that AASHO then narrowed to four. Full-size versions of the signs were erected on a road near the AASHO road test site while a special meeting of the organization was underway in August 1957. State highway officials were able to observe the signs in daylight, dark, rain, and shine. They decided on a combination of designs submitted by Missouri and Texas—the now familiar red, white, and blue shield.

The real blame fell on Congress, Mumford said, which approved the 1956 act based on a study of highways, "not a study of the real problems." It had been "jammed through Congress so blithely and lightly," Mumford said, "on a dubious pretext," namely America's love of the automobile and the idea that it was "a necessary part of our defense program." He dismissed the latter claim as "nonsense" because "there is no defense against total extermination in nuclear warfare, no defense except peace."

The conference made national news, painting the highway experts as the "bad guys." The consensus among critics was that the urban Interstates should be suspended until comprehensive land use plans could be drawn to incorporate them.

The initial reaction of State highway officials is reflected in a speech by AASHO President William A. Bugge to a regional AASHO branch. He rejected the suggestion that highway officials needed "some expert assistance from outsiders." The idea of a 2-year moratorium for urban Interstates, as some had called for, "is a bit ridiculous," because the "economic penalties for delaying already vitally needed facilities for another 2 years would be tremendous," he said.

Despite the warning signs, the highway community had much to celebrate as 1957 ended. The States broke the record in dollars invested in all highway development by spending nearly \$4.6 billion. Through December 1, more than \$1 billion in Federal and State funds had been committed to Interstate projects, and projects totaling \$247 million were completed.

Funding Problems

Secretary Weeks released the first Interstate Cost Estimate (ICE) in January 1958. It covered 62,037 kilometers (38,548 miles) of the Interstate System (excluding mileage added in 1957) and pegged costs at \$37.6 billion (Federal share: \$33.9 billion). However, the Secretary did not see a need for additional authorizations. As techniques for estimating costs were refined, he said, future estimates would more accurately reflect trends "either upward or downward." Until then, an increase in funding "would be premature."

The Secretary's caution was soon confronted by economic reality. By August 1957 the country had slipped into a recession that would increase unemployment to 7 percent and reduce corporate profits by 25 percent by April 1958. One of the reasons the President had promoted the Interstate System was to counteract just such a situation

—so that he would have a public works program that could be expanded or contracted to influence the economy.

To stimulate the economy and avoid losing momentum, Congress passed the Federal-Aid Highway Act of 1958. It increased Interstate funding by \$800 million for FYs 1959-1961 and included an emergency increase of \$400 million for the Federal-aid systems in FY 1959.

Because these increases occurred without a change in taxation to boost revenue, the 1958 act also suspended the 1956 law's "Byrd Amendment"—for deficit hawk Senator Harry Flood Byrd (D-VA)—which required the Commerce Secretary to hold apportionments below the point of creating red ink in the Highway Trust Fund. President Eisenhower approved the legislation in April 1958, just as the recession was ending.

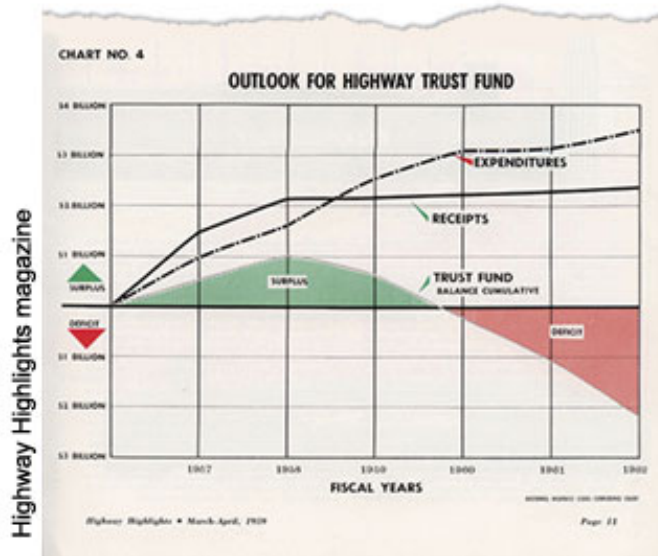


Secretary of Commerce Sinclair Weeks, whose department included BPR, was a businessman from Massachusetts and chairman of the Republican Party's Finance Committee. President Eisenhower said of him, "This great highway system will stand in part as a monument to the man in my Cabinet who headed the department responsible for it, and who himself spent long hours mapping out the program and battling it through the Congress-Secretary of Commerce Sinclair Weeks."

By the end of the year, Interstate construction expenditures exceeded trust fund receipts. Additional income would be needed to avoid reduced apportionments in FY 1961 under the restored Byrd Amendment. The looming crisis led many in the highway community to fear what the American Road Builders Association (ARBA) described as "a complete collapse of work on the Interstate System."

Critics attributed the funding imbalance to "gold-plating," especially in urban areas. They created the term "90-itis" to describe the attitude of State highway officials who, they said, had no reason to be economical because the Federal Government was picking up 90 percent of the cost. As Representative John A. Blatnik (D-MN) of the House Committee on Public Works would say, "Congressman after congressman got up on the floor of the House and made wild speeches, frightening speeches . . . saying we had a shortage of funds because the States were playing fancy-free and foot-loose with the taxpayers' dollars."

To maintain the construction schedule, President Eisenhower recommended a temporary 1.5-cent increase in the gas tax, but the Federal-Aid Highway Act of 1959 added only a penny (increasing the tax to 4 cents a gallon) through June 1961. The legislation, which the President approved on September 21, also reduced FY 1961 Interstate authorizations to \$2 billion, but because of the Byrd Amendment, BPR could apportion only \$1.8 billion.



The National Highway Users Conference used this chart to illustrate the problems affecting the Highway Trust Fund in the late 1950s. The group explained: "The ascending solid black line represents cash receipts coming in each year to the Fund; the broken black line, annual cash expenditures. The shaded green areas show the cumulative surplus in the Trust Fund, and the shaded red areas the cumulative deficit."

While signing the 1959 act, President Eisenhower disclosed that he had asked a member of his staff, Major General John Bragdon (U.S. Army, retired), to study the Interstate program with attention to delineating Federal versus State and local responsibilities in financing, planning, and supervising the highway program. Bragdon also would be responsible for determining ways to improve coordination between planning for Federal-aid highways and State and local planning, especially for urban areas. At the same time, Speaker of the House Sam Rayburn (D-TX) appointed Representative Blatnik in September 1959 to head the Special Subcommittee on the Federal-Aid Highway Program investigating corruption allegations.

The Urban Problem

Shocked by the intensity of objections to the Interstate System from Mumford and others, the highway community tried to regain its footing by holding a summit at

Syracuse University in October 1958. Committees of the American Municipal Association, AASHO, and Highway Research Board joined the university in what was billed as the first National Conference on Highways and Urban Development. Funded by the Automotive Safety Foundation, the conference featured highway officials and elected officials, primarily mayors, who supported the goal of making the Interstate System work for the orderly development of urban communities. The critics were not invited.

The goal was a "grand accounting" in which the advantages and disadvantages of each alternative for highway users and the community were to be evaluated. As E. H. "Ted" Holmes, BPR's assistant commissioner for research at the time, would recall many years later, "Probably no one present, however, had any notion of the difficulty of measuring the community costs and benefits."

The Urban Revolt Begins

If the highway community left the Syracuse conference with renewed optimism, it soon had a reminder of how difficult a challenge it faced in urban areas.

Several cities were seeing resistance to Interstates, particularly from those whose homes or businesses would be acquired for rights-of-way. In San Francisco, for example, opposition focused on the Embarcadero Freeway (I-480) that was to link the San Francisco-Oakland Bay Bridge (I-80) with the Golden Gate Bridge (U.S. 101). City officials had proposed the freeway in 1943 as a way of using a needed transportation artery to revitalize a blighted area near the Ferry Building and a former farmer's market. State highway officials used a double-deck design that they considered "an ultramodern highway facility." After the initial section opened in February 1959, it came to symbolize what the *San Francisco Chronicle* called "a crime which cannot be prettied up."

In January 1959, the Board of Supervisors of the City and County of San Francisco met to discuss the proposed Western Freeway (I-80) through the Sunset District. With more than 160 freeway opponents cheering, the board adopted a resolution opposing construction of all freeways in the San Francisco Master Plan. The resolution cited "the demolition of homes, the destruction of residential areas, the forced uprooting and relocation of individuals, families and business enterprises" as well as the loss of property from the tax rolls.

Concerns about the impact of the Interstate System on urban areas would be summarized in the April 14, 1960, issue of *The Reporter* magazine. "New Roads and Urban Chaos" was written by Daniel P. Moynihan, a professor who had served on the staff of New York Governor Averill Harriman. Moynihan began by quoting *The Wall Street Journal's* description of the Interstate program as "a vast program thrown together, imperfectly conceived and grossly mismanaged, and in due course becoming a veritable playground for extravagance, waste, and corruption."

Darius Aidala for the City of San Francisco



One of the earliest Interstate battles took place in San Francisco, CA, where the double-decked Embarcadero Freeway (I-480) became a focal point for objections. Although additional construction was blocked, the freeway remained in place until it was damaged by the Loma Prieta Earthquake in October 1989.

Moynihan declared that "the crisis has come. In one metropolis after another, the plans have been thrown together and the bulldozers set to work." At this late stage, metropolitan planning would be difficult, especially given the shortage of planners. Still, he said, "almost any effort to think a bit about what we are doing would help." He advocated funding flexibility because he was convinced that city officials would use at least 50 percent of the Interstate funding for mass transit and commuter facilities if they could.

Moynihan was sure the pending congressional investigations would turn up thieving, mischief, and blunder. "If not," he said, "it will be necessary to investigate the investigators," but he hoped for a more serious reappraisal in the next Administration. "We may yet impart some sanity and public purpose to this vast enterprise." He closed, "Roads can make or break a Nation."

As Ike Leaves Office

Meanwhile, the highway community awaited two reports, namely Bragdon's report to the President and the new ICE, both of which were expected to provoke additional concerns. Rumors about the Bragdon report were circulating for months, particularly that it would call for abandoning the urban Interstates, downsizing the program, and converting it to toll facilities. Bragdon and his staff had peppered BPR with questions and requests for a year before issuing a 12-page report embodying these concepts just 3 days before the end of the Eisenhower Administration. It was quickly forgotten.

Although Bragdon's untimely report was ignored, Congress could not ignore the 1961 ICE. This estimate, submitted to Congress on January 11, put the total cost of the Interstate System, including past expenditures, at \$41 billion (Federal share: \$37 billion). Based on work underway and previous authorizations of \$25.4 billion, Congress would have to authorize an additional \$11.5 billion to complete the Interstate construction program on schedule—or scale it back.

As the Eisenhower Administration ended on January 20, 1961, 16,802 kilometers (10,440 miles), or 25 percent, of the Interstate System was opened to traffic. More than \$10 billion was spent. Lingering concerns would need to be addressed by

incoming President John F. Kennedy and his appointed officials. General L. W. Prentiss, executive vice president of ARBA, put the situation facing the Interstate System in stark terms: "The highway program is in for the battle of its life."

To be continued in the May/June 2006 issue of Public Roads magazine.

Richard F. Weingroff is the information liaison officer in the FHWA Office of Infrastructure.

For more information on the early days of the Interstate System, visit www.fhwa.dot.gov/interstate/homepage.cfm or www.fhwa.dot.gov/infrastructure/history.htm.

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March/April 2006 · Vol. 69 · No. 5



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JUNE 29, 1956 A DAY IN HISTORY

by
Richard F. Weingroff
Federal Highway Administration

June 29, 1956, was just another Friday, filled with the usual mix of national, international, feature, sports, and cultural activities as reported in newspapers across the country.

Fifty years after President Dwight D. Eisenhower signed the Federal-Aid Highway Act of 1956, that event has assumed more importance than it seemed at the time. The event did make page one of *The New York Times*, above the fold, on June 30, but wasn't the day's big story. Reading right to left along the top of page one, the big stories were:

POLISH RIOT LASTS INTO SECOND DAY; 38 DEAD, 270 HURT

4.5 BILLION IN FOREIGN AID VOTED BY SENATE, 54 TO 25

WILSON DECLARES BUDGET IS SECOND TO MILITARY MIGHT

STEEL STRIKE DUE TO START TONIGHT; TALKS AGAIN FAIL

The Wilson headline referred to the fact that Secretary of Defense Charles E. Wilson had testified before a hearing of the Senate Armed Services Subcommittee on the Air Force regarding whether the United States or the Soviet Union had the lead in the nuclear air power race. He denied that the President had subordinated national defense to political budget cutting in a presidential election year. (The United States was doing okay in the nuclear arms race.)

Below a picture of the steel negotiators, the *Times* reported:

Eisenhower Signs Road Bill; Weeks Allocates 1.1 Billion

The article by John D. Morris began:

President Eisenhower set into motion a record \$33,480,000,000 road-building program today by signing the bipartisan authorization bill that Congress sent him Tuesday. Sinclair Weeks, Secretary of Commerce, immediately announced the allocation of \$1,125,000,000 among the states for the first year of what he called "the greatest public-works program in the history of the world."

Morris reported that:

The main feature of the program is a 41,000-mile network of limited-access roads linking 90 percent of all cities with populations of more than 50,000.

The Federal Government will distribute \$25,000,000,000 among the states over the next thirteen years to meet 90 percent of the cost.

The words “interstate system” did not appear until the final two paragraphs of the 13-paragraph article.

The signing of the new law was not accompanied by the usual ceremony featuring the President handing pens to smiling Members of Congress. He was at Walter Reed Army Medical Center preparing for his release on Saturday, June 30. He had entered the center on June 7 after suffering severe stomach pains. He had experienced stomach problems for years, but this time, doctors determined that the cause was ileitis (an inflammation of the ileum, part of the small intestine) and that surgery was needed immediately.

As a result of the hospitalization, history reveals the unique medical characteristics of the President as he signed the *Federal-Aid Highway Act of 1956*. The medical bulletin issued at 8:10 a.m. indicated that:

The President had another good restful night. He slept almost continuously for nine hours. His temperature is 98.2; pulse, 72; blood pressure, 120 over 70, and respiration, 18, all of which are normal. He held his gain in weight [163 pounds].

To prepare for his departure on June 30, the President walked down a flight of nine steps to the next lower floor and then back up again. For the first time since the surgery, the President had three working sessions. To preserve his strength, the 27 bills he had to sign were divided into two batches—13 in the morning, 14 in the afternoon. In the third working session, he met with Vice President Richard M. Nixon for 15 minutes to discuss the Vice President’s upcoming trip to the Philippines and South Vietnam.

And so history was made. But at the time, much else had happened around the country, as reflected in this survey of *The New York Times* for June 30, 1956.

Most of the news of Friday, June 29, 1956, has been forgotten. But judged strictly by the number of books and articles, as well as current interest, perhaps the biggest story of the day occurred in White Plains, New York, where Marilyn Monroe married Arthur Miller. The *Times* explained, helpfully, that the 30-year Monroe was a “film actress,” but that perhaps does not do justice to the reigning sex symbol of the 1950s. The 40-year old Miller was a “Pulitzer Prize-winning dramatist.” The ceremony took place at 7:21 p.m. and lasted less than 5 minutes. “Mr. and Mrs. Miller then got into their sports car and disappeared into traffic.”

In Roxbury, Connecticut, Miss Mara Sherbatoff, chief of the New York bureau of *Paris-Match*, the French magazine, was killed in a crash on the way to a press conference called by Monroe and Miller. Miss Sherbatoff’s driver lost control on a sharp turn and his car smashed into a tree, hurling Miss Sherbatoff out of the vehicle.

President Eisenhower was involved in several other events on that Friday in June. At the suggestion of the National Security Council, he approved a gradual increase in exchanges of information and people through the Iron Curtain separating the United States and eastern Europe’s Soviet bloc countries. The goal, according to the White House announcement, was “better understanding of the peoples of the world that must be the foundation of peace.”

The President also accepted “with deepest regret” the resignation of Dr. Leonard A.

Scheele as Surgeon General of the U.S. Public Health Service. Dr. Scheele, who headed the Salk polio vaccine program, said he was leaving to provide "more properly for the future security of my family" than was possible on his salary of \$17,000 a year. He reportedly had accepted a position as president of the Warner-Chilcott Laboratories, a division of the Warner-Lambert Pharmaceutical Company.

Elsewhere in Washington, the *Times* reported that Secretary Wilson had criticized the publication of secret testimony that "an all-out atomic attack on the Soviet Union would cause hundreds of millions of deaths on both sides of the Iron Curtain." Calling the information "somewhat exaggerated," Wilson said the release would cause Secretary of State John Foster Dulles "unnecessary trouble."

In view of the concern about the Soviet nuclear threat, an important event occurred in Kingston, New York. Equipment began to roll off a production line for the new SAGE program. The *Times* explained that SAGE, which stood for Semi-Automatic Ground Environment, "is to be a vast system of air defense using the latest electronic equipment. It will direct aerial intercepting weapons intended to locate and destroy attacking enemy bombers or missiles with a minimum of time and effort." Thirty-two electronic direction centers were to be built. This deployment would be superior to the present system, which used human calculating teams, because of its "virtual inability to be suddenly overwhelmed by a mass enemy attack."

The joint Atomic Energy Committee approved, 14 to 0, plans to build large-scale atomic power plants. The Atomic Energy Commission (AEC) would be authorized to spend \$400 million to speed peacetime use of atomic energy. The AEC, which favored development by private industry, opposed the bill on behalf of the Eisenhower Administration. Senator Al Gore, Sr. (D-Tenn.), author of the bill and one of the chief authors of the *Federal-Aid Highway Act of 1956*, told reporters that reactors would be limited to AEC installations even though the reactors would produce "only a drop in the bucket" for agency needs. Summarizing Gore's comments, the article explained that this limit was needed "to head off a fight between public power and private power advocates in the Senate, where the bill was expected to run into heavy opposition."

Elsewhere on Capitol Hill, the House Rules Committee voted to kill a housing proposal that exceeded the Administration's recommendations. The bill called for 180,000 public housing units over 3 years, compared with the Administration's request for 35,000 annually.

Because 1956 was an election year, the front-runner for the Democratic nomination for President was promoting his candidacy. Former Illinois Governor Adlai Stevenson, the President's opponent in 1952 and (as it turned out) in 1956, concluded two days of conferences on political strategy, especially on how he could win New York in November. Although Stevenson "kept himself virtually isolated" on June 29, he did speak by telephone with two New York supporters, Mrs. Franklin D. Roosevelt and Mayor Robert F. Wagner of New York City. (In Atlanta, Senator Richard B. Russell of Georgia endorsed Senator Lyndon B. Johnson of Texas as the "best hope" for the Democratic Party in 1956. Senator Johnson, Russell said while in Atlanta for a \$50-a-plate party dinner, was "more in sympathy with states' rights than other possible nominees.")

Representatives of the Republican and Democratic Parties were in San Francisco to address the annual convention of the National Association for the Advancement of Colored People (NAACP). On behalf of the Republicans, Representative Hugh Scott of Pennsylvania told delegates that a vote for Democrats was a vote for the southern Democrats who controlled Congress, including the House Rules Committee "where civil rights bills get the suffocation treatment." He was particularly tough on

Stevenson, who “counts on you to lie down and take it while he gets in bed with those who would deny you the full rights of free citizenship.”

Representative Sidney R. Yates of Illinois, representing the Democrats before the NAACP, accused the Republicans of doing nothing about civil rights until the election year. In contrast to “the fighting leadership” of Democratic President Harry S. Truman, President Eisenhower had waited three years before offering “a limited program of civil rights legislation.” He criticized the President for not helping implement the Supreme Court’s 1954 ruling in *Brown v. Board of Education* that separate-but-equal facilities were unconstitutional.

As these and dozens of other important events were occurring on Friday, June 29, the American people had many distractions that may have prevented them from keeping up with the news.

Baseball was the major sports story, with all 16 Major League teams active on Friday, June 29. The *Times* was most interested in the New York teams. The league leading New York Yankees defeated the Washington Senators, 3 to 1, at Yankee Stadium. “Manager Casey Stengel was in no mood to celebrate” because his most reliable starter in recent weeks, Bob Grim, had strained an elbow tendon and would probably miss his next start. The Brooklyn Dodgers also won, defeating the Philadelphia Phillies, 6 to 5, in “a whirlwind finish that saw three successive homers vanish from sight on four pitches” in the ninth inning. Duke Snider, Randy Jackson, and Gil Hodges hit the homers in that order. The New York Giants lost 6-3 to the Pittsburgh Pirates in Pittsburgh.

Elsewhere in the Major Leagues, the Boston Red Sox beat the Baltimore Orioles (7-6), the Detroit Tigers blanked the Kansas City Athletics (5-0), the Cleveland Indians and Chicago White Sox split a day-night double header, while the Chicago Cubs defeated the National League leading Milwaukee Braves.

Viewers settling down at home for television that night would have chosen from such programs as:

- “Mama,” the sitcom starring Peggy Wood.
- “Sherlock Holmes,” starring Ronald Howard in “Case of the Vanished Detective”
- “Our Miss Brooks,” a repeat of the episode in which Eve Arden and costar Robert Rockwell are concerned about the postman’s disappearance.
- “Life of Riley” was also a repeat in which Riley (William Bendix) tries to win a free family vacation.
- “Playhouse of Stars” featured a 90-minute play called “Weapon of Courage” about a handicapped bank employee and a planned bank robbery.
- “Person to Person” included interviews by Edward R. Murrow of jazz musician Dizzy Gillespie and author and radio broadcaster Emily Kimbrough.

Late night, Steve Allen’s guests on the “Tonight” show were pianist Byron Janis and producer Mervyn Le Roy. Chances are, however, viewers that weekend were more interested in Allen’s Sunday night show, “The Steve Allen Show.” The newspaper carried several advertisements for an appearance on the 8 pm show by “the new Elvis Presley.” Presley’s June 5 performance on “The Milton Berle Show,” featuring a pelvic-

swiveling version of “Hound Dog,” had created a scandal, so Allen would present the “new” Elvis in a tuxedo singing the song to a basset hound. Elvis also appeared in a comedy sketch with Allen and guests Imogene Coca and Andy Griffith.

If television didn’t interest Americans the night of June 29, they had a wide selection of movies to see. “The King and I” starring Yul Brynner and Deborah Kerr had just opened. “Oklahoma” was in its 9th month of showings. Other movies playing that night included:

- Gene Kelly in “Invitation to the Dance”
- Walt Disney’s “The Great Locomotive Chase” with Fess Parker
- John Wayne in “The Searchers”
- Gregory Peck in “The Man in the Gray Flannel Suit”
- Bette Davis and Ernest Borgnine in “The Catered Affair”
- Bob Hope and Eva Marie Saint in “That Certain Feeling”
- Jane Russell in “The Revolt of Mamie Stover”
- Walter Pigeon, Anne Francis, and Leslie Nielsen in “Forbidden Planet”
- Brigitte Bardot in “Doctor at Sea”
- Bill Haley and the Comets in “Rock Around the Clock”

President Eisenhower, of course, was confined to his hospital room. That night, the President dined with his wife Mamie and their son John and his wife Barbara. On Saturday, June 30, the President and his wife were driven to their home in Gettysburg, Pennsylvania, where they celebrated their 40th wedding anniversary on Sunday.

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Moving the Goods

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/>

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- Submit any comments or questions:
Richard Weingroff
Office of Infrastructure
richard.weingroff@dot.gov.

Highway Resources

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Moving the Goods: As the Interstate Era Begins

by
Richard F. Weingroff
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 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 <http://www.fhwa.dot.gov/infrastructure/naming.htm>.)

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 <http://www.fhwa.dot.gov/policy/otps/costallocation.htm>). 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.



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United States Department of Transportation - **Federal Highway Administration**

Original Intent: Purpose of the Interstate System 1954-1956

by
Richard F. Weingroff
Federal Highway Administration

From the vantage point of the 21st century, we can see how the Interstate Highway Program launched in 1956 turned out. But as the Federal-Aid Highway Act of 1956 was working its way through the legislative process, what did the people involved think the Interstate System would accomplish?

In a July 1954 speech to the Governors' Conference (forerunner of the National Governors Association), President Dwight D. Eisenhower asked for help in devising a Grand Plan for upgrading the Nation's highways - Federal, State, and local. (Vice President Richard M. Nixon delivered the speech after a death in the family prevented the President from attending.) The President listed the problems to be overcome:

Safety - an annual toll of nearly 40,000 killed and 1.3 million injured.

Congestion - wastes billions of hours in detours and jams amounting to billions of dollars in productive time.

Courts - civil suits related to traffic clog up our courts.

Economy - bad roads nullify the efficiency in the production of goods by inefficiency in their transport.

Defense - "the appalling inadequacies to meet the demands of catastrophe or defense, should an atomic war come."

In President Eisenhower's many public statements about the Interstate System, he spoke of a mix of these benefits. For example, his State of the Union Address on January 6, 1955, included this summary: "A modern, efficient highway system is essential to meet the needs of our growing population, our expanding economy, and our national security." A year later, his Annual Message on the Economic Report, dated January 24, 1956, stated that, "The country urgently needs a modernized interstate highway system to relieve existing congestion, to provide for the expected growth of motor vehicle traffic, to strengthen the Nation's defenses, to reduce the toll of human life exacted each year in highway accidents, and to promote economic development."

More Information

[Designating the Urban Interstates](#)
[The Genie in the Bottle: The Interstate System and Urban Problems, 1939-1957](#)

Contact

Richard Weingroff
[Office of Infrastructure](#)
richard.weingroff@fhwa.dot.gov

Behind the scenes, one other factor influenced his thinking. Stephen E. Ambrose, in his biography of Eisenhower, cited the public reasons the President referred to, but added one factor:

[It] was a public-works program on a massive scale, indeed the largest public-works program in history, which meant that the government could put millions of men to work without subjecting itself to the criticism that this was "make-work" of the [Depression-era] WPA or PWA variety. By tailoring expenditures for highways to the state of the economy, Eisenhower could use the program to flatten out the peaks and valleys in unemployment. [Ambrose, Stephen E., *Eisenhower: Volume Two: The President*, Simon and Schuster, 1984, p. 250.]

Ambrose elaborated on this point:

One of Eisenhower's favorite programs for reducing the peaks and valleys on the GNP chart was the Interstate System. Back in November 1955, the President had talked to [economic advisor Gabriel] Hauge, then informed [Secretary of Commerce Sinclair] Weeks that he wanted Commerce to plan to use the Interstate System for managing the economy. As Hauge put it, "That was the fundamental purpose of the plan in the initial instance." [p. 301]

Thus, in addition to the public discussion of original intent, President Eisenhower had a private reason for his Grand Plan as he sought to avoid the economic peaks-and-valleys that had always plagued the American economy.

The Governor's Special Highway Committee

After Vice President Nixon's presentation on the President's behalf, the Governors formed a Special Highway Committee to develop a plan. For data to support their ideas, the Governors turned to the U.S. Bureau of Public Roads (BPR). Section 13 of the Federal-Aid Highway Act of 1954 had called for a "comprehensive study of all phases of highway financing, including a study of the costs of completing the several systems of highways... and of the progress and feasibility of toll roads..." Although the study was not complete, BPR made the basic data available to the Governors' Special Highway Committee.

The BPR had calculated that modernizing the Nation's roads and streets over the next 10 years would cost \$101 billion. Of this amount, about \$23.2 billion was needed for construction of the Interstate System. This estimate covered only the 37,681 miles designated in August 1947 under the terms of the Federal-Aid Highway Act of 1944. This mileage included 2,882 miles of urban thoroughfares carrying the mainlines

through the cities the Interstates connected. Within the 40,000-mile limit the 1944 Act established for the Interstate System, the BPR had reserved the remaining Interstate mileage, totaling 2,319 miles, for additional urban circumferential and distributing routes that would be designated after further study - in September 1955 as it turned out. The BPR could not make even a preliminary estimate of the full urban costs.

The Governors, in *A Cooperative Program for Highway Construction*, reported that population growth and increases in the gross national product (GNP) required improved highways. "An adequate highway system is vital to the continued expansion of the economy" to support the expected population growth. However, the Governors pointed out that expected growth of GNP "will not be realized if our highway plant continues to deteriorate." They spelled out the relationship:

The relationship is, of course, reciprocal; an adequate highway network will facilitate the expansion of the economy which, in turn, will facilitate the raising of revenues to finance the construction of highways.

Aside from these factors, the Governors believed an improved highway network was needed because of "the cost of inadequate and unsafe highways." Based on data from the Automobile Manufacturers Association, the Governors reported that the "direct cost" of an inadequate system of highways was \$3 billion a year. This figure did not include "hidden costs" such as "urban land blight and unrealized industrial and agricultural potentials."

The Governors did not attempt to measure the "savings" in dollars and cents resulting from achieving maximum safety, but explained that "whatever the potential savings in life and limb may be, it lends special urgency to the designing and construction of an improved highway network."

Finally, the Governors stated that aside from "the role highways perform as arteries of commerce," they also play an important role as employer and consumer. They cited a BPR publication, *Highways in the United States*, as the source for this summary:

More than 9.5 million persons - one of every seven workers in the United States - has a job directly connected with highways or their use. One out of every six retail, wholesale and service businesses is connected with motor vehicles.

In short, the Governors did not doubt the need for an improved highway network:

The inadequacy of our present network of highways is a matter of common knowledge. Traffic jams,

insufficient parking space, frequent detours, and worn-out surfaces serve the motoring public as indices of the situation, just as traffic counts, sufficiency analyses, accident rates, transportation costs and other technical indices serve the expert. In spite of record expenditures for highways, the situation has reached a critical stage.

An adequate highway construction program was needed for the coming 20 years at about double the current rate of expenditures. To accomplish such a program, the Governors believed the Nation's highways should be divided into three systems - the Interstate System, other Federal-aid systems, and State and local systems. Given the overriding Federal interest in the Interstate System, the Governors wanted the Federal Government to assume primary responsibility, with State participation, for financing its construction. The Governors suggested several funding options, but were less concerned about the financing details than the amount the States would be expected to pay. They wanted to limit the States' share of costs to about \$140 million a year. This was the amount the States were contributing as their share of the cost of the Interstate System under the Federal-Aid Highway Act of 1954, which had authorized \$125 million a year (FY's 1955 and 1956) with a Federal share of 60 percent.

The Governors presented their plan to President Eisenhower at the White House on December 3, 1954.

The President Sends His Plan to Congress

After the Grand Plan speech, President Eisenhower asked his friend and advisor, General Lucius D. Clay (U.S. Army, Retired), to head a committee to work with the Governors and propose a plan of action for nationwide highway improvement. The Governors' committee worked with General Clay, so he was aware of their views as he developed his proposal in October and November 1954.

On February 22, 1955, President Eisenhower forwarded the Clay Committee's report, *A 10-Year National Highway Program*, to Congress. The transmittal letter began:

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 throughout the Republic is matched by individual and commercial movement over a vast system of interconnected highways crisscrossing the country and joining at our national borders with friendly neighbors to the north and south.

Together, the united forces of our communication and transportation systems are dynamic elements in the very name we bear - United States. Without them, we would be a mere alliance of many separate parts.

The Nation's highway system, he said, is "a gigantic enterprise" but "is inadequate for the nation's growing needs." The need for action was inescapable. He cited safety (more than 36,000 killed and a million injured each year on the highways at a cost of more than \$4.3 billion a year), the poor physical condition of the roads (translating into higher shipping costs, about \$5 billion a year, that are passed on to consumers), the need to evacuate cities in the event of an atomic attack (the present system would be "the breeder of a deadly congestion within hours of an attack"), and the inevitable increase in traffic as the population and the gross national product increased ("existing traffic jams only faintly foreshadow those of 10 years hence").

The President described the Nation's highway systems, including the National System of Interstate Highways (its official name at the time), the primary system and the secondary system. "Of all these," he said, "the interstate system must be given top priority in construction planning. But at the current rate of development, the interstate network would not reach even a reasonable level of extent and efficiency in half a century."

He summarized the needs as determined by BPR in its draft report that had still not been transmitted to Congress. (The report, finally transmitted to Congress in March 1955, had been delayed because the chief author, the BPR's Herbert Fairbank, had been ill for some months.) The preliminary 10-year needs by road system, he reported, were:

System	Billions
Interstate (urban \$11, rural \$12 billion)	\$23
Primary (urban \$10, rural \$20 billion)	30
Secondary (entirely rural)	15
Other roads and streets (urban \$16, rural \$17 billion)	33

TOTAL (urban \$37, rural \$64 billion)	\$101
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The President noted that the Governors' Conference and the Clay Committee agreed that the Federal share of total needs should be about 30 percent, with the rest being the responsibility of State and local governments. Overall, the President's transmittal letter stated, the Clay Committee recommended that the Federal Government assume principal responsibility for the Interstate System, to be completed by 1964.

The President stated that a "sound Federal highway program, I believe, can and should stand on its own feet, with highway users providing the total dollars necessary for improvement and new construction." Interstate and other Federal-aid roads, therefore, should be financed by highway user excise taxes, "augmented in limited instances with tolls." All in all, though:

I am inclined to the view that it is sounder to finance this program by special bond issues, to be paid off by the above-mentioned [highway user tax] revenues which will be collected during the useful life of the roads and pledged to this purpose, rather than by an increase in general revenue obligations.

Referring to the Clay Committee's report and the BPR's pending report on highway needs, the President concluded:

Inescapably, the vastness of the highway enterprise fosters varieties of proposals which must be resolved into a national highway pattern. The two reports, however, should generate recognition of the urgency that presses upon us; approval of a general program that will give us a modern safe highway system; realization of the rewards for prompt and comprehensive action. They provide a solid foundation for a sound program.

The Clay Committee Report

The Clay Committee's 54-page report stated that highway transportation - 48 million cars, 10 million trucks, and a quarter of a million buses operating on 3,348,000 miles of roads and streets - is "by far the most comprehensive public transportation network in the world." The role of the automobile could not be denied:

In relatively recent years, the motor vehicle has come to occupy a unique place in America, not only because it is a major unit of transportation, but also because it is an intimate and seemingly indispensable part of our daily life. The bread winner uses an automobile to get to work; the housewife to shop; children ride in a car or

bus to school, and the entire family relies on the automobile for many social and recreational activities.

Still, highways functioned as part of a transportation network:

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.

The report acknowledged the concerns of the railroad executives, who had pointed out to the committee that improved highway facilities were a competitive threat because they would result in increased truck haulage:

However, this Committee was created to consider the highway network, and other media of transportation do not fall within its province.

Before addressing the financial issues, the report summarized why highway improvements were needed. First was "The Traffic Jam," which could be reduced to its "simplest terms":

Traffic has expanded sharply, without a corresponding expansion in capacity of roads and streets.

"Simple arithmetic," as the report stated, illustrated why the Nation was experiencing "expensive, hazardous bottlenecks": 58 million registered motor vehicles driving 557 billion vehicle-miles in 1954. Prospects for the future were even worse - 81 million vehicles by 1965 traveling 814 billion vehicle-miles.

Given the importance of highway transportation to the national economy, the report pointed out that the expenditures called for, which may have seemed high, were necessary:

The increasing use of our highways contributes materially to the growth of our national product, since industry and employment directly related to the highway transportation system and its byproducts account for about one-seventh of its total value.

Moreover, the improvement of our highway systems as recommended herein would reduce transportation costs to the public through reductions in vehicle operating costs competently estimated to average as much as a penny a mile. Based on present rates of travel, this saving alone would support the total cost of the accelerated program.

Deterioration of the highways was another factor in support of the expanded program. Vehicle registrations

and travel mileage were not the only increases. Vehicle weights, average speeds, and axle loads were up, causing a serious deterioration of inadequately designed highways. The 4-year moratorium on construction during World War II had taken its toll, but so had inflation:

While dollar expenditures for road construction increased in approximately the same ratio that their purchasing power has declined, the actual level of construction is not much higher than it was in 1940.

Safety, the report stated, must also be considered. The annual death toll on the Nation's roads was, as the President had pointed out, "comparable to the casualties of a bloody war." Replacing obsolete and dangerous highways with roads of modern design would substantially reduce the toll:

The death rate on high-type, heavily traveled arteries with modern design, including control of access, is only a fourth to a half as high as it is on less adequate highways.

For the Interstate System, civil defense issues were "of utmost importance." The report explained:

Large-scale evacuation of cities would be needed in the event of A-bomb or H-bomb attack. The Federal Civil Defense Administrator has said the withdrawal task is the biggest problem ever faced in the world. It has been determined as a matter of Federal policy that at least 70 million people would have to be evacuated from target areas in case of threatened or actual enemy attack... The rapid improvement of the complete 40,000-mile interstate system, including the necessary urban connections thereto, is therefore vital as a civil-defense measure.

Referring to the difference between overall 10-year needs (\$101 billion) and present program funding (\$47 billion), the report stated that closing the gap of \$54 billion is the goal if highway transportation "is to perform its vital job in an expanding economy":

The sums needed to accelerate the program may seem high; they are not high in terms of what we have done in the past in relationship to our much larger and still growing gross national product.

The role of highways in the national economy was clear:

The increasing use of our highways contributes materially to the growth of our national product, since industry and employment directly related to the highway transportation system and its byproducts account for our one-seventh of its total value.

Moreover, the improvement of our highway systems as recommended herein would reduce transportation costs to the public through reductions in vehicle operating costs competently estimated to average as much as a penny a mile. Based on present rates of travel, this saving alone would support the total cost of the accelerated program; it is further evidence of the desirability of undertaking improvement as a capital investment.

As for cost, the Clay Committee relied on the draft BPR report, which estimated that the Interstate mileage designated in August 1947 would cost approximately \$23 billion. The urban mileage consisted of single routes carrying rural Interstates through the cities they connected. To be fully effective, the Interstate System "must be tied in much more closely with existing roads in congested areas." This could be accomplished by "the major feeder and distribution routes which at present are not included within any of the Federal-aid systems." In the absence of BPR data on these routes, the committee estimated that "a desirable improvement program" of the most important connecting roads for the interstate network would cost \$4 billion.

The urban cost assumptions by the Clay Committee resulted in an estimate of \$27 billion for the Interstate System. That was the figure Congress would have to fund to create the 10-year program President Eisenhower had proposed.

The report concluded:

We are indeed a nation on wheels and we cannot permit these wheels to slow down... We have been able to disperse our factories, our stores, our people; in short, to create a revolution in living habits. Our cities have spread into suburbs, dependent on the automobile for their existence. The automobile has restored a way of life in which the individual may live in a friendly neighborhood, it has brought city and country closer together, it has made us one country and a united people.

But, America continues to grow. Our highway plant must similarly grow if we are to maintain and increase our standard of living... In fact, we face a challenge today and America has ever evidenced its readiness to meet a challenge head on with practical bold measures...

Thus, we will accomplish the objective sought by the President for a "a grand plan for a properly articulated highway system that solves the problems of speedy, safe, transcontinental travel - intercity transportation - access highways - and farm-to-market movement - ... paying off in economic growth - ... and making "a good start on the highways the country will need for a population of 200 million people."

A City Perspective

Beginning February 21, 1955, Senator Al Gore, Sr., Chairman of the Subcommittee on Roads of the Committee on Public Works, began hearings on the National Highway Program. On February 28, Mayor Ben West of Nashville, Tennessee, testified on behalf of the American Municipal Association (AMA), which represented 12,000 municipalities in 44 States. Mayor West's testimony offers a glimpse of what cities expected from the Interstate System.

Mayor West began by reading a resolution the AMA had adopted at its annual meeting after General Clay had outlined his committee's plans during a December 1 speech. The association endorsed construction of the Interstate System as essential to the "continued prosperity of this Nation." The urban portion would, the resolution noted, "serve to strengthen the economy of all centers of employment and production." Further, "cities alone or together in partnership with State highway programs can no longer cope with expanding traffic demands." In view of these considerations, the AMA fully endorsed the Federal highway program outlined by General Clay and pledged its full cooperation in securing its passage.

In addition, Mayor West quoted an AMA policy statement adopted during the same meeting. The statement noted that an examination of needs showed "the most serious deficiencies to be in and around municipalities." It continued:

The most pressing problems and the areas of greatest neglect are on the Interstate Highway System with expressways and important major arterial streets to that system. This is particularly true in the urban areas. We therefore recommend strong concentration on improving the Interstate System including the urban links thereon.

The statement cited the importance of the Interstate System to evacuation of cities in time of national emergency. Noting that any evacuation that depends on the current road network "will fall far short of the goal and result in millions of additional casualties," the statement determined that "the construction of adequate evacuation routes consisting of expressways and important arterial streets and roads thereto is as much a Federal responsibility as it is a local one."

The remainder of the Mayor's opening remarks, as well as the AMA policy statement, concerned procedural issues, such as Federal share and financing mechanisms. Most of the questioning from members of the committee concerned these issues as well. However, in response to a question from Senator Prescott Bush (the current President's grandfather), Mayor West stated that at least 90 percent of the members of the AMA

agreed with the resolution. He said, "We felt that the main difficulty was in and around the areas where population is concentrated - that is, traffic jams, and tie-ups - and that the Interstate System under the Clay plan would take that into consideration, going through or around municipalities."

Senator Strom Thurmond asked Mayor West if he thought "it would be better to just start from scratch and build it out from the city and not try to follow the old road system, from the standpoint of economy and efficiency and completion of the system." This question gave the Mayor an opportunity to cite Nashville as illustrative of other cities:

Around our own city we have 10 State highways coming into the city. The Bureau of Public Roads engineers have... got it down to where there are five major highways. They join the existing highways farther out, and are bringing traffic in on one brand new proposed highway from each direction. They are taking those highways under their tentative plan through new territory, and we have retained some engineers in New York to plan for us a beltline which will connect these new Federal highways to get the people around our city.

We have a central city problem as all the cities do. In our central city we have a river on the east and a railroad gulch on the west and 3 bridges over the river and 3 viaducts over the railroad, and all the traffic has to come through the center of the city.

Most of the cities in the past have had bad planning. All the traffic pushes through the center of the city, and we want to circle the central business district with Federal highways with limited-access roads, because these new highways, as the engineers explained to me, will be limited-access beginning way out from the city, and then we want to get on and off at the junction of these beltlines with these Federal highways.

Several other Mayors testified along with Mayor West on behalf of the AMA. Mayor William E. Kemp of Kansas City, Missouri, for example, responded to a question about the necessity of the new roads for evacuation:

I want to say that that is not all of it. We need it every day. We need far more traffic ways and highways in our city because the concentration of vehicular traffic in our cities is so great that the present means of traveling through these congested areas without these trafficways is a terribly burdensome thing upon our people and upon the economy.

Mayor Albert E. Cobo of Detroit, Michigan, testified mainly on financing issues. He favored upfront financing for the entire 10-year program instead of a pay-as-you-go approach:

[It] is evident that the present Interstate Highway System could not be met in less than 30 years, and it appears to be 34, 35, or 36 years. I feel sure that the people do not want to wait 30 years and are willing to pay the extra interest costs [from an upfront bond issuance] so that they may have the use of these highways in the immediate future.

Shortly after enactment of the Federal-Aid Highway Act of 1956, Bernard F. Hillenbrand, Assistant Director of the AMA, published an article called "The Road Program - Opportunity and Challenge From the City Viewpoint" (American Highways, October 1956). The article reflected the optimism, even enthusiasm, of city officials. Hillenbrand stated:

A modern highway gives a tremendous economic boost to the surrounding areas... Obviously city officials are anxious to attract as much of this economic activity within the city as possible... Undeveloped land previously set aside for future residential development may now be more valuable to the community as a whole if it is opened to industrial and commercial uses.

Smaller communities near the larger cities were likely to "experience rapid new growth" so planners should think on a metropolitan basis. Planners would be busy:

In planning highway alignments, city officials for obvious reasons will want the proposed routes to pass through the city's slum and blighted section in preference to the city's finer residential and business areas... Highways are made possible and at the same time new life is brought to tired neighborhoods.

The program was so new, Hillenbrand explained, that municipal officials would have to change their perspective. "There has been so little road construction in cities of the scope and magnitude contemplated in this new program that there is little or no experience to guide officials." He added:

Municipal officials have all but ceased to talk of the dream highways and expressways which were outside the realm of possibility for generations. There is now a new burst of life.

This view was widespread, virtually unquestioned, among State highway officials, city officials, and urban planners - until construction got underway. What most strikes a 21st century observer is that none of the Mayors discussed the concerns that would overwhelm debate about the urban Interstates within months after construction began in the cities - disruption and displacement of residences and businesses; decline of central business districts; loss of tax base; suburbanization (now called sprawl); destruction of minority

and impacts on transit.

Conclusion

In 1955, no one questioned the need for the Interstate System, as outlined by General Clay and the President. The one controversial issue was how to pay for it. Congress could not agree on a method in 1955. Congress rejected the plan developed by General Clay. In fact, the financial plan had little support in Congress, even from the President's strongest supporters. Alternative financing schemes based on tax increases also failed, largely because of lobbying by the highway interests that wanted the Interstate System but didn't want to pay for it.

The Senate passed Senator Gore's bill in 1955, but it lacked a financing mechanism - under the Constitution, tax provisions must originate in the House of Representatives. In July 1955, however, the House rejected all versions of the legislation, including bills with the Clay Committee financing plan and another with increased highway user taxes.

After Congress adjourned on August 2, 1955, the highway interests worked with key Members of Congress over the winter to develop an acceptable tax package that was embodied in the Federal-Aid Highway Act of 1956. This basic financial structure - revenue from highway user taxes, including a gas tax increase, credited to the Highway Trust Fund - would serve the Nation throughout the Interstate era.

The Interstate System would achieve much of its original intent. It would be the safest road network in the United States and one of the safest, if not the safest, in the world. Its design concepts would be used on non-Interstate roads to make them safer as well. It would sustain the economy and support international competitiveness even as the economy evolved from an industrial era to an information age in a worldwide marketplace. In addition, the Interstate System has proven invaluable to the national defense through countless military endeavors. The record on evacuations, particularly with oncoming hurricanes, is mixed but improving with experience.

It would prove, however, to be an ungainly lever for controlling the economy as President Eisenhower had envisioned. Because of the multi-year nature of highway construction and the pay-as-you-go basis of its financing mechanism, job-creating expenditures could not easily be increased or decreased to match economic needs. The President had an opportunity to use the Interstate lever in operation during a sharp recession that began in August 1957. The Federal-Aid Highway Act of 1958, which President Eisenhower approved on August 8, 1958, attempted to stimulate the economy by increasing authorizations for Interstate

construction, but without an equal increase in tax revenue for the Highway Trust Fund. The short-lived recession had ended in April 1958, before increased construction could have any impact on it, but under the 1958 Act, the Highway Trust Fund expended more funding than it took in, creating the first financial crisis of the Interstate Era.

Perhaps the greatest failure, however, was that the Interstate System did not relieve congestion. In some respects, the comments about congestion, circa the mid-1950's, could be used about congestion in the 21st century, with changes only in the data (population, number of vehicles, miles traveled, and cost of congestion). Many factors contributed to this failure, including population growth, demographic changes, increased number of vehicles per household, expansion of urban areas, social changes, and the inability to expand the highway network commensurate with demand (leaving aside the question of desirability).

The city officials who testified before Congress in the mid-1950's were primarily interested in congestion relief. If traffic could flow freely to the central business district, the outward flow of residences and businesses would be slowed, the city tax base would be maintained and even increased, blighted neighborhoods would be replaced, and the central business districts would regain their former preeminence. The failure to relieve congestion was one reason why the urban Interstates were unable to stem what was already a decline in city viability. Moreover, much to the surprise of the AMA, the BPR, and others who supported the Interstate System in the 1950's, the urban Interstates would quickly be depicted as a primary villain in the decline of the Nation's cities, a charge that has been repeated many times by urban advocates and social critics in the years since 1956.

President Eisenhower's 1963 memoir, *Mandate for Change 1953-1956*, contained a prediction based on the original intent:

More than any single action by the government since the end of the war, this one would change the face of America... 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.

The next 40 years would be filled with unexpected engineering challenges, unanticipated controversies, and unforeseen funding difficulties. Nevertheless, the President's view would prove correct. The Interstate System, and the Federal-State partnership that built it, changed the face of America - and its cities.

This article reflects the original intent of those who helped launch the Interstate Era in 1956. Their views were shared by those responsible for the conception of the Interstate System in reports to Congress in 1939 (*Toll Roads and Free Roads*) and 1944 (*Interregional Highways*), but the key BPR officials behind those reports, Chief Thomas H. MacDonald and Herbert Fairbank, included a different element in their original intent, namely revitalization of the Nation's declining cities. The two reports describe a visionary plan to use expressway construction as the centerpiece of the revitalization. "The Genie in the Bottle" in the September/October 2000 issue of *Public Roads* magazine (<http://www.fhwa.dot.gov/infrastructure/rw00c.htm>) describes these plans. Additional information can be found in the online article, "Designating the Urban Interstates" (<http://www.fhwa.dot.gov/infrastructure/fairbank.htm>).

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ARTICLES

DEPARTMENTS

[Guest Editorial](#)

[Along the Road](#)

[Internet Watch](#)

[Communication Product Updates](#)

[Training Update](#)

[Conferences/
Special Events Calendar](#)

[Previous Issues](#)

[Subscriptions](#)

[Public Roads Home](#)

January/February 2006

The Year of the Interstate

by Richard F. Weingroff

In 2006, the 50th anniversary of "the greatest public works project in history" calls for a celebration--and an appeal for a searching look at the future of transportation.



Photo: Massachusetts Turnpike Authority

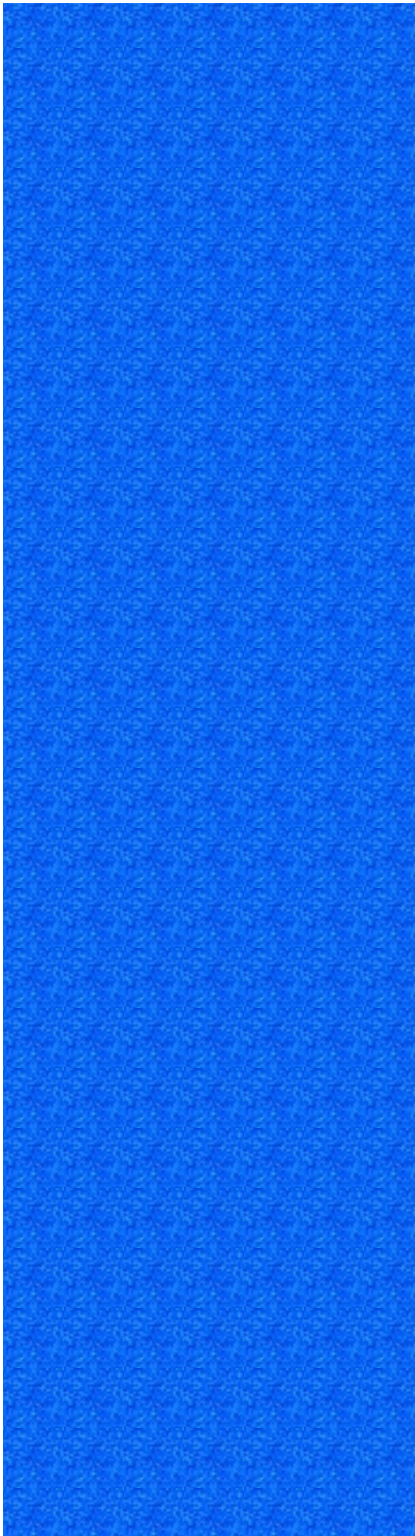
The above photo shows the Leonard P. Zakim Bunker Hill Bridge in Boston, MA. Photo: Massachusetts Turnpike Authority

One mark of the overwhelming success of the Eisenhower Interstate System is that the American people take it for granted, as if it has always been there, like the Mississippi River or the Rocky Mountains. The Interstates are so much a part of the daily life of Americans that most people do not realize that the system they use to get to work, to school, to the mall, and to their vacation destination could be considered one of the "wonders of the world."

In 2006, the Federal Highway Administration (FHWA), State departments of transportation (DOTs), and transportation partners in the private sector will have the opportunity to remind the American people that the Interstate System is not a natural phenomenon, but rather the result of dedicated men and women working for five decades to enhance the mobility that has always been part of the American dream. Those years of challenge and controversy were also a period of technological evolution, environmental stewardship, and, most of all, commitment to the goal of building the Dwight D. Eisenhower National System of Interstate and Defense Highways.

In the National Interest

The origins of the Interstate System go back to studies in the late 1930s and early 1940s. Section 7 of the Federal-Aid Highway Act of 1944 authorized designation of a 65,000-kilometer (40,000-mile) "National System of Interstate Highways." Within that original mileage limitation, the routes were designated in 1947 and 1955, but in the absence of a national program and a Federal commitment to build the roadways, little was accomplished.



Today, Interstate engineering marvels span the country, from the Leonard P. Zakim Bunker Hill Bridge (previous photo) in Boston, MA, to H-3 (both photos) in Hawaii. Photos: David Sailors, Parsons Brinckerhoff Quade & Douglas, Inc., courtesy Hawaii DOT.

In 1956 the pieces finally fell into place. Although the Federal-Aid Highway Act of 1956 contained many provisions affecting the Interstate System, the key legislative phrase in section 108 is breathtakingly simple and direct: "It is hereby declared to be essential to the national interest to provide for the early completion of the 'National System of Interstate Highways,' as authorized and designated in accordance with section 7 of the Federal-Aid Highway Act of 1944."



Shown here is one of the country's main Interstate highways of an earlier era: U.S. 40 (Atlantic City, NJ, to San Francisco, CA) in 1953 at its intersection with Ingleside Avenue west of Baltimore, MD.

That simple phrase--"the national interest"--is all the justification the legislators who created the bill thought was needed, perhaps because they believed the interest was obvious, widely understood, and shared. They added only that one component of the national interest was "national defense," so section 108 also changed the name of the new network to the "National System of Interstate and Defense Highways." (In 1990, President George H. W. Bush signed legislation changing the name of the Interstate System to honor President Eisenhower.)



The standard road sign for the Dwight D. Eisenhower National System of Interstate and Defense Highways, designed by FHWA and the American Association of State Highway and Transportation Officials, was unveiled in a ceremony on Capitol Hill on July 29, 1993. Left to right: Chairman Nick J. Rahall (D-WV) of the House Surface Transportation Subcommittee, John Eisenhower (President Eisenhower's son), Federal Highway Administrator Rodney E. Slater, and Chairman Norman Y. Mineta (D-CA) of the House Committee on Public Works and Transportation.

Of all the bills that President Eisenhower signed during his 8 years in office, he probably put as much of himself into the one that created the Interstate System as any other, and more than most. Unfortunately, he did not have an opportunity to celebrate the occasion with a formal ceremony. The bill was among a stack that he signed on June 29, 1956, his last day at Walter Reed Army Medical Center following surgery on June 7. He made no recorded comment, issued no statement, had no celebratory photo taken. He was said to be "highly pleased."



Dwight Eisenhower Library

President Dwight D. Eisenhower, the "Father of the Interstate System," was convinced the highway network would "change the face of America."

One might wonder what his thoughts were as he signed the new law. Perhaps he was just relieved that the job was done, or worried that the job was just beginning. History does not say whether he worried that the men and women who would have the job of carrying out his vision in "the national interest" might falter, but it does reveal, 50 years later, that they did carry out the vision and did so triumphantly.

Adapting to a Different World

If Eisenhower was the visionary promoter behind the Interstate System, Francis C. "Frank" Turner was its spirit. He joined the U.S. Bureau of Public Roads (BPR) in 1929, and by the 1950s was in position to serve as executive secretary of the committee the President formed, under retired General Lucius D. Clay, to develop a plan for a National Highway Program. He also was the liaison between the BPR and the House and Senate committees as they developed the 1956 Act. Once it went into effect, Turner

worked with State highway officials on many of the location and design decisions prior to construction of Interstate highways around the country. He would serve as Federal Highway Administrator (1969-1972), the only career employee to head the agency.



Frank Turner speaks at the dedication of the Francis C. Turner Building at the Turner-Fairbank Highway Research Center in McLean, VA, on May 5, 1983. Turner was honored as "a man who thrived on change, believed in innovation based on facts gathered through research, and played a significant role in implementing research results in the United States and the world."

Turner was a transitional figure, helping the agency adapt to changing demands on the Interstate System as it developed in the context of the eras it passed through. The early Interstates were the best roads built to that date, the product of an evolutionary design process that can be traced through Germany's autobahn (1930s), the Pennsylvania Turnpike and Arroyo Seco Parkway in Los Angeles (both 1940), and the turnpike boom of the late 1940s and early 1950s. Opponents said the early Interstates were produced from a "cookie-cutter" design.

The Way It Was in 1956

How much the Nation has changed since that June day in 1956! Television was black and white, every kid in America could sing the theme to "Davy Crockett," and everyone loved Lucy and all the other TV characters who were the era's role models. Cars had fins, an Oldsmobile 88 deluxe sedan cost \$2,688, and traffic was increasing every year, but passenger rail was still the preferred choice for long distance travel.

Elvis Presley topped the charts with "Don't Be Cruel," and other performers in the Top 10 included the Platters, Gogi Grant, Doris Day, and Nelson Riddle. Playwright Arthur Miller married actress Marilyn Monroe on the same day that President Eisenhower signed the Interstate bill. "Around the World in 80 Days" won the Academy Award for Best Picture, the New York Yankees beat the Brooklyn Dodgers in the World Series, and President Eisenhower defeated Illinois Governor Adlai Stevenson in a landslide.

Over the decade, the number of children ages 5-14 grew from 24.6 million in 1949 to 40.0 million in 1960, while U.S. homeowners increased from 23.6 million to 32.8 million. Americans were moving to the suburbs in increasing numbers. The Nation's schools were adjusting to the Supreme Court's landmark 1954 decision in *Brown v. Board of Education of Topeka*, and society began to adapt to a revolution in civil rights.

Still years off were the copy and fax machines, cable television, microwave ovens, personal computers on every desk, e-mail and e-commerce, a man on the moon, recycling, the Beatles, Spider-Man, the assassination of a President, "The Sixties," iPods® and BlackBerries™, compact discs and DVDs, the Vietnam War, dependence on foreign oil, the collapse of the Soviet Union, and 9/11 and the war on terrorism. Betty Friedan's *The Feminine Mystique*, Ralph Nader's *Unsafe at Any Speed*, and Rachel Carson's *Silent Spring* had not yet initiated movements that would change America.

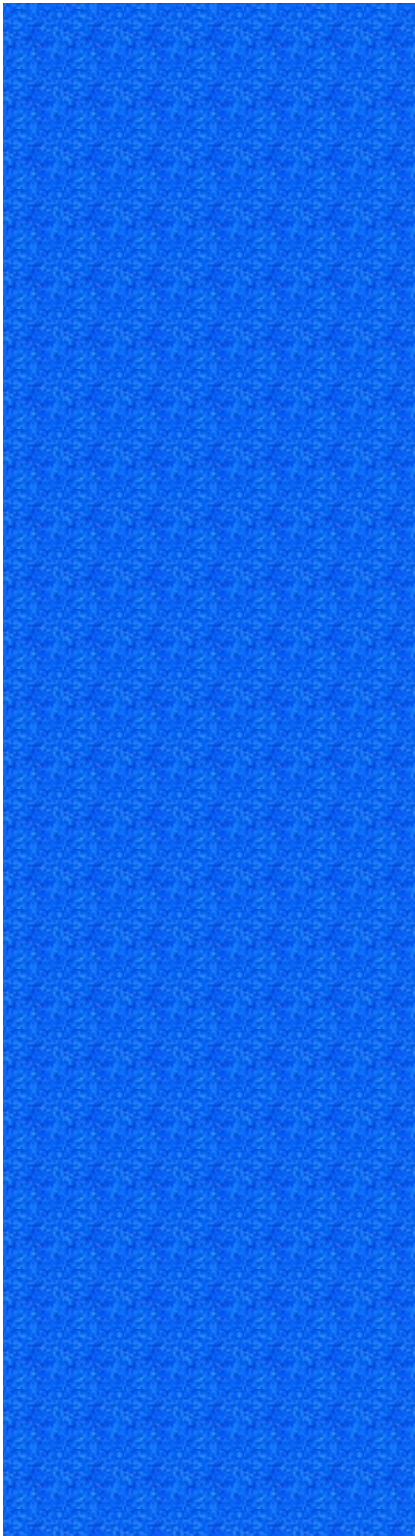
However, the design was never static. The public and private partners who created the Interstate System adapted the highways to operational and safety experience, criticism from the environmental community and safety advocates, and advances in bridge, pavement, and tunnel technologies. Each generation of Interstate engineers topped its predecessors, so that today, engineering marvels span the country, from the Leonard P. Zakim Bunker Hill Bridge in Boston, MA, to H-3 in Hawaii.



Shortly after President Dwight D. Eisenhower signed the Federal-Aid Highway Act of 1956 on June 29, Secretary of Commerce Sinclair Weeks apportioned FY 1957 Interstate Construction funds. Two days later, on August 1, cameras snapped as Secretary Weeks (center) signed the FY 1958 apportionment, with Commissioner of Public Roads Charles D. "Cap" Curtiss (left) and Under Secretary of Commerce for Transportation Lewis Rothschild looking on.

An example of that evolution was the Papago Freeway in Phoenix--the final segment of transcontinental I-10 (Jacksonville, FL, to Santa Monica, CA). When the Interstate first appeared on the drawing boards, it was to be an elevated highway that would soar 10 stories above Phoenix's Central Avenue. "Helicoil" interchange ramps provided "safe, easy" access to the structure, according to a promotional brochure. Twenty years of controversy later, on August 10, 1990, the Arizona Department of Transportation (ADOT) opened the "missing link" in I-10--below ground through a tunnel topped by a long grassy strip called the Margaret T. Hance Park, which links the communities on either side of the highway.

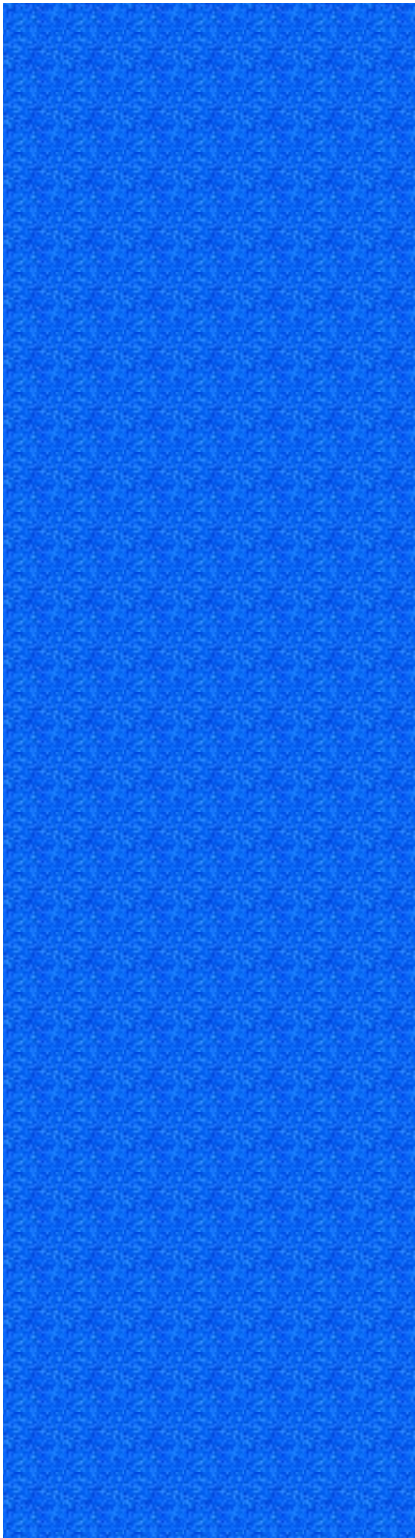
William Ordway, director of ADOT from the mid-1970s to the mid-1980s, during the peak of the Papago struggles, probably put it best: "Painful and costly as were the delays, there's no question that we got a better freeway, friendlier toward the city, with high-occupancy vehicle lanes, and built-in beautification. The combined expertise of all of America's freeway building was available for the Papago."



In the original 1960s design for an elevated I-10 Papago Freeway, the Arizona Highway Department proposed a new interchange design called a "helicoil" that would require traffic to take a 280-degree loop to the ground. The elevated freeway and helicoil interchanges were abandoned in favor of construction below ground with a deck carrying the Margaret T. Hance Park linking the communities on either side of the highway.



Design of the Interstate System evolved from earlier freeways, such as the Pennsylvania Turnpike (above) and the Arroyo Seco Parkway (below, now the Pasadena Freeway) in Los Angeles, both of which opened in 1940.



He could have been describing the evolution of countless Interstate System highways.



The opening of the Leif Erickson Tunnel in Duluth, MN, on October 28, 1992, completed I-35 (Duluth to Laredo, TX). The Duluth segment began as a conventional freeway that would have cut off access to the shoreline and eliminated historic properties. With the help of a Citizens Advisory Committee, the Minnesota Department of Transportation (Mn/DOT) redesigned I-35 to include cut and cover tunnels, architectural design treatments, and extensive landscaping. Mn/DOT spokesman John Bray said, "The great thing is that this . . . was Duluthians deciding what was best for Duluth and then all working together to make it happen." *Photo: Mn/DOT.*



Idaho Transportation Department

Years of controversy delayed construction of I-90 through Wallace, ID, the final segment of the route (Boston, MA, to Seattle, WA). On September 12, 1991, the \$40 million I-90 viaduct bypass opened, putting an end to the widely publicized "last stoplight on I-90." Two days later the town held a "Last Stop Celebration" to bury the stoplight. With tongue in cheek, City Councilman Mike Aldredge told a crowd of more than 1,000, "Cruel progress has eliminated the need for the services of our old friend."

Changing the Cookie-Cutter

One of the most important features of the Interstate System is uniformity in design and signage to eliminate surprises that could result in safety and operational problems. These standards would be necessary as the Interstate expanded across the Nation and made cross-country commerce and travel possible.

The close partnership between Federal and State agencies played an important role in establishing standards in design, operations, and safety. Design guidelines issued by the American Association of State Highway and Transportation Officials (AASHTO) are adopted by FHWA as national standards, and likewise, FHWA is responsible for standards such as those in the *Manual on Uniform Traffic Control Devices*. Standards are updated when necessary as innovations and new solutions to problems are developed.



During the 40th anniversary of the Interstate System, the Federal Highway Administration developed a "Men of Vision" display featuring the Interstate System founding fathers: (left to right) Representative Hale Boggs (D-LA), former Federal Highway Administrator Francis C. "Frank" Turner, Representative George H. Fallon (D-MD), President Dwight D. Eisenhower, and Senator Albert Gore, Sr. (D-TN).

From the early years, highway engineers across the country built Interstates to match geographic and other challenges. Through creativity, sensitivity, and engineering expertise, each State built highways that, while uniform in some respects, were unique to their settings. Even in the late 1950s, the U.S. Bureau of Public Roads was referring to "the broad sweep, the varied facets of accomplishments" that were part of the Interstate story. Given the diversity of the United States, this part of the history should not be surprising. But it is a part of the story that has been lost, in part because the Interstate System has had its share of opponents.

Author and social scientist Lewis Mumford was a harsh observer of the Interstate System from the start, particularly its impacts on U.S. cities. He said that in passing the 1956 Act, Congress "hadn't the faintest notion of what they were doing." Looking back, perhaps he was right. Maybe no one fully understood that the legislation would not simply create better highways, but would "change the face of America," as President Eisenhower put it in his 1963 memoir *Mandate for Change*.

The Interstates have never been able to shake the cookie-cutter image, the idea that traveling the Interstates involves the "mind-numbing monotony" of traveling on "brain-deadening" roads in an "effortless, rolling trance." (These quotes are real, by the way, from various travel writers of the 1990s.) The Interstates have been blamed for many perceived ills of the American society, from sprawl to air pollution to a lack of sense of place, from racial tensions to alienation to dependence on foreign oil. And those involved in building an Interstate highway over the past 50 years have learned about the determined individuals and organizations who fought Interstates from start to finish.

The challengers have been persistent, but perhaps the men and women who built the Interstate System should be thankful that their feet have been held to the fire all these years; the Interstates and other roads are the better for it. It is likely that the transportation community would not have made as much progress in the conception and design of the Interstates and other highways. Similarly, much less effort would have been devoted to historic preservation and development of context-sensitive designs such as noise barriers, aesthetic treatments, and other environmentally sensitive solutions to help fit roadways into the surrounding environment. As illustrated by the transformation of the I-10 Papago Freeway, I-66 inside the Capital Beltway, I-70 through Glenwood Canyon in Colorado, the I-476/Blue Route in Philadelphia, the I-105 Glenn Anderson Freeway/Transitway in Los Angeles, and countless other Interstates, the transportation community was challenged to create highways that better fit the environment and communities that surround them. Instead of trying to overcome the environment, as in the early years, highway engineers learned to team up with experts from other disciplines, particularly planners and environmental specialists, historic preservationists, and with citizens to accomplish their objectives in ways that are consistent with their responsibilities for environmental stewardship.

The struggles are part of the history of the Interstate System. So are the engineering marvels stretched across the country like gems scattered by a giant's hand. As are the Federal, State, and industry leaders, as well as the thousands of anonymous men and women who helped to build the Interstate System. And another part of history is the laws that extended and transformed the program over the years, from the National Environmental Policy Act of 1969 that provided a framework for resolving the controversies to the Intermodal Surface Transportation Efficiency Act of 1991, which authorized the final funding for the Interstate construction program and launched the post-Interstate era. Observers may debate whether the Interstates' impacts are more positive or negative, but not, as President Eisenhower predicted, whether they have transformed the Nation.

The Year of the Interstate

With the 50th anniversary of the Interstates falling on June 29, 2006, FHWA will join its partners in the State DOTs and the private sector to tell the story of the Dwight D. Eisenhower National System of Interstate and Defense Highways. This is not an "inside-the-Beltway" story (a phrase that did not exist before construction of I-495 encircling Washington, DC). It is a story that has a unique variation in each State and in the District of Columbia. It is a story that affects U.S. economic competitiveness in a world marketplace, national defense from the Cold War to the war on terrorism, and the daily life of every American. It is a story about agreeing on a national goal and achieving it through a Federal-State

transportation partnership forged over the years, starting with the creation of the Federal-Aid Highway Program in 1916.



Administrator Slater at the start of the tour in San Francisco, CA.



Stan Smith (right), commissioner of the Indiana Department of Transportation, introduced Administrator Slater at a happy 40th birthday ceremony in Indianapolis.



1996 Cross-Country Interstate Anniversary Road Tour

To commemorate the 40th anniversary of the Interstate System, Federal Highway Administrator Rodney E. Slater embarked on a cross-country tour paralleling the U.S. Army's 1919 transcontinental convoy (from the Zero Milestone in Washington, DC, to Golden Gate Park in San Francisco, CA) that gave future President Dwight D. Eisenhower an understanding of the need for better roads. The tour proceeded in reverse, California to Washington, from June 17 to June 26, 1996.



The cross-country tour ended where the 1919 convoy began-at the site of the Zero Milestone on the Ellipse south of the White House.

The 50th anniversary is an opportunity for the transportation community to tell a big story about the past. But it is also an opportunity to focus public attention on the future. The Interstates will remain a vital part of the transportation network for as far into the future as anyone might dare predict. Although the formal program initiated under the 1956 Act is at an end, more Interstates are on the drawing boards or under construction, while older routes are being upgraded to meet future needs, reflecting the vitality of the concept 50 years after it was put into law. How will the Interstates evolve? How will the Nation find the resources so these highways can continue to provide the vital service they have from the start? Could anything replace them, that is, carry the people and goods represented by 703 billion vehicle miles of Interstate travel annually?

**THE DWIGHT D. EISENHOWER SYSTEM OF
INTERSTATE AND DEFENSE HIGHWAYS**



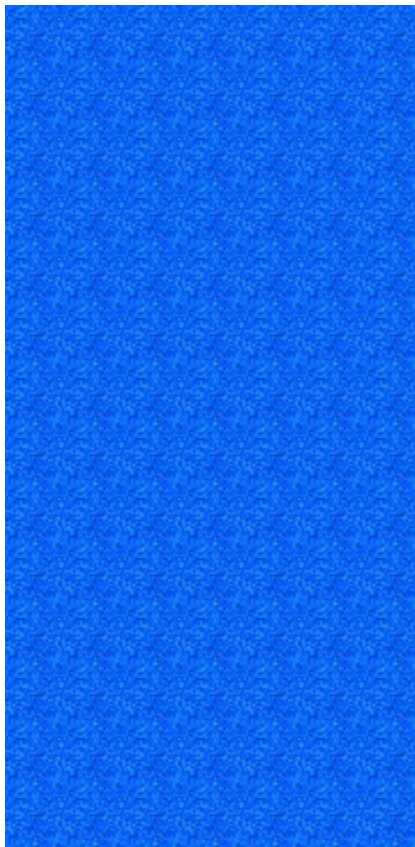
Source: U.S. Department of Transportation, Federal Highway Administration.

This celebration of the past is an opportunity to explore a future where the Dwight D. Eisenhower National System of Interstate and Defense Highways will continue to serve the American people in "the national interest," and continue to be instrumental in keeping the Nation's economy moving.

Richard F. Weingroff is the information liaison specialist in FHWA's Office of Infrastructure. He wrote about the origins of the Interstate System in the Summer 1996 issue of PUBLIC ROADS and took a comprehensive look at President Eisenhower's role in that history in the March/April and May/June 2003 issues of PUBLIC ROADS ("The Man Who Changed America, Part I" and "The Man Who Changed America, Part II"). He also wrote a prequel, "The Man Who Loved Roads," about President Harry S. Truman's contribution, in the May/June 2002 issue of the magazine.

For further information, contact Richard F. Weingroff at richard.weingroff@fhwa.dot.gov or 202-366-4856. Or see the FHWA "Highway History" Web page at www.fhwa.dot.gov/infrastructure/history.htm.

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[The Year of the Interstate](#)

[Financing Megaprojects](#)

[Rule on Work Zone Safety and Mobility](#)

[The Older Driver Comes of Age](#)

[Mimicking Mother Nature](#)

[Improving Freight Transportation](#)

[Energy Losses in Storm Drain Access Holes](#)

January/February 2006 · Vol. 69 · No. 4



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