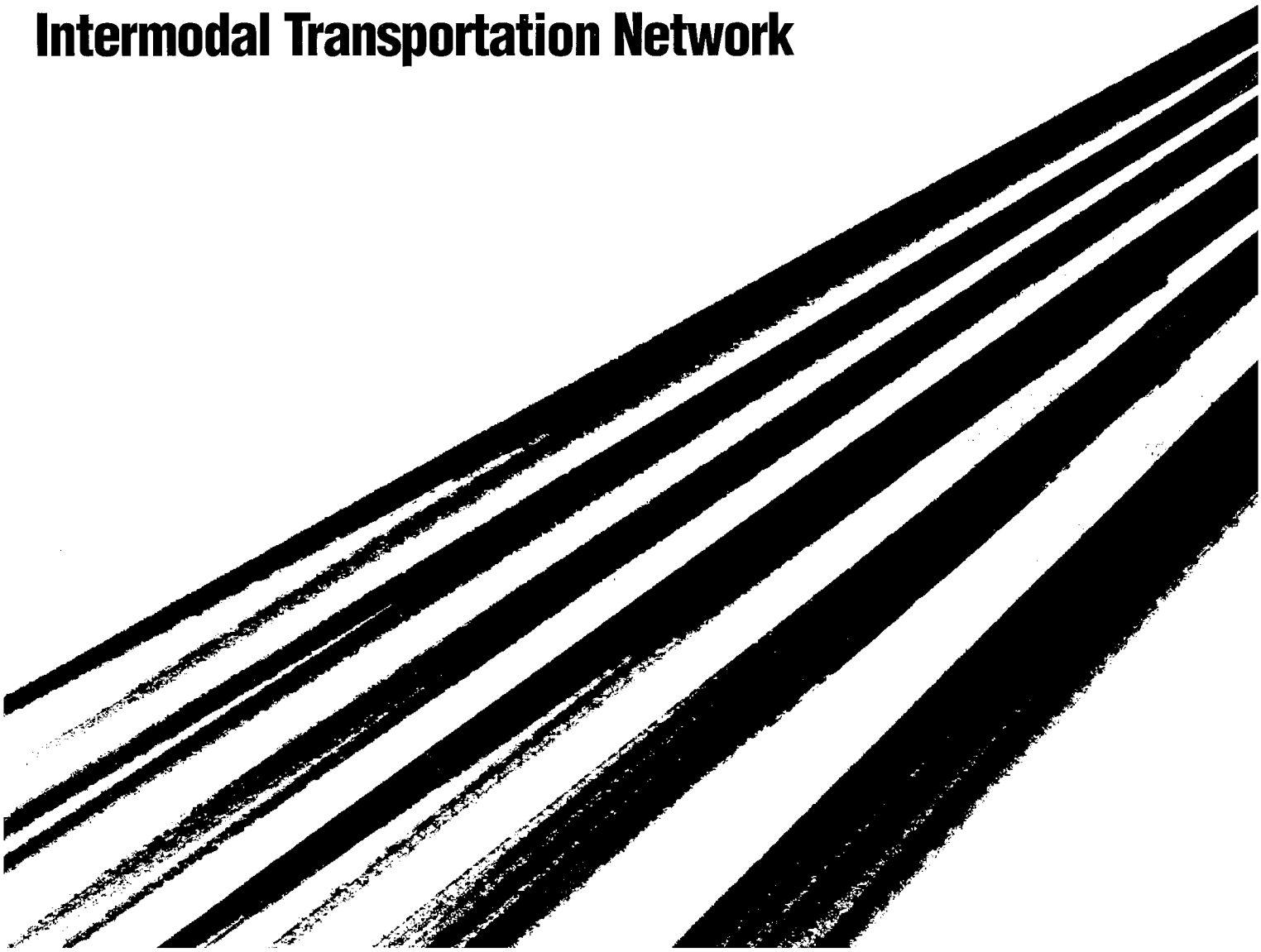
U.S. Department
of Transportation

**Federal Highway
Administration**

Intermodal Surface Transportation Efficiency Act

The National Highway System

The Backbone of America's Intermodal Transportation Network



Report to Congress on the Proposed National Highway System Required by Section 1006(a) of the Intermodal Surface Transportation Efficiency Act of 1991 Public Law 102-240

UNITED STATES DEPARTMENT OF TRANSPORTATION

December 1993

THE NATIONAL HIGHWAY SYSTEM IN CONTEXT
SECRETARY OF TRANSPORTATION FEDERICO PEÑA

FOREWORD

America's transportation systems are the foundation for our economic growth. Each year we spend about $1 trillion on transportation services—about 17 percent of our Nation's total output. The infrastructure of roads and bridges, rail and waterways, airports, transit lines, and other transportation systems which serve our economy is often taken for granted.

But if we wish to preserve and increase America's prosperity, we must maintain this infrastructure and improve our ability to move people and goods more efficiently. At the same time, we should realize that the transportation decisions we make dramatically affect America's economy and global competitiveness, Americans' jobs, our environment, and the quality of life in our communities.

The National Highway System (NHS) is an important, first step in helping us make better transportation choices for America's future. The Federal Highway Administration, together with all 50 States, the District of Columbia, and Puerto Rico, has met a challenging mandate from Congress in proposing an NHS, with links to major ports, airports, rail terminals, military bases, and transit lines.

This nearly 159,000-mile network includes all of the Interstate highways, major arterials and military roads, and key corridors designated by Congress. It will provide clear guidance for Federal and State highway investment decisions for years to come.

The NHS reflects the new emphasis on better investment of public funds called for in the ***National Performance Review*** led by Vice President Gore. At the same time, the NHS embodies the commitment to a more flexible, balanced transportation system that Congress enacted in the landmark Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). The ISTEA called for linking "...all forms of transportation in a unified, interconnected manner...economically efficient and environmentally sound...the foundation for the Nation to compete in the global economy...[to] move people and goods in an energy efficient manner."

The proposed NHS is a major step toward those goals. But the NHS is best regarded as a foundation upon which we can build. What we must do now is to take what we have learned in developing the NHS and broaden our view. We must aim to integrate all modes of transportation—by road, rail, transit, air, water, and pipelines—in a truly comprehensive National Transportation System (NTS) for the 21st century.

I believe that developing an NTS will allow all of us to travel at lower cost and with fewer delays. It will lower the price of American manufactured goods and services by reducing the time and money spent on transportation. Those savings, in turn, will enable American companies to compete better in markets at home and around the world—and create more American jobs.

The NTS will help us correct the way transportation financing has sometimes led us to make segmented, poorly connected investments in our transportation system. All too often, transportation investments at all levels of government have been made mode by mode—on just highways, on just transit, on just airports—without making connections between modes or weighing alternatives. The availability of Federal funding for specific modes has sometimes contributed to skewing choices toward certain transportation facilities and away from more cost-effective alternatives.

Further, we have far too rarely considered the impact of public investment decisions on private transportation infrastructure and investments. Frequently, we have not provided sufficient access to ports, terminals, and other facilities where private operators have invested to improve the system. With its emphasis on both more efficient investment of public funds and on creating more public-private partnerships, this year's ***National Performance Review*** calls on us to overcome such distortions in transportation spending and strategy.

The ISTEA itself, of course, mandated better investment decision-making by establishing a statewide intermodal planning process and by providing funding flexibility within programs and across some surface modes. But many programs, particularly those affecting intercity transportation, still reflect the kind of modal separation that makes planning and building an effective NTS difficult.

That is why I believe that the development of an NTS is essential—both to realize the vision of ISTEA and to enable America to plan the transportation system we will need to compete and win—in the world economy. And that is why the Department of Transportation (DOT) is taking the lead in working with Congress, Federal Agencies, State and local officials, private businesses, and citizens' groups to craft a blueprint for America's 21st century NTS.

The NTS

In our view, the NTS should consist of the most significant elements of the Nation's transportation system. It should clarify their interrelationships and their contributions to the movement of goods and people, to the national economy, to America's international competitiveness, and to the needs of the American people.

The NTS should include both freight and passenger systems in both intercity and local networks. Beginning with the NHS, the NTS should include the most nationally significant airports, ports, waterways, railroads (freight and passenger), intercity buses, pipelines, intermodal connections, and local public transit systems. Clearly, the NTS will need to take account of privately owned as well as public transportation infrastructure and facilities.

While an NTS can be represented spatially, we must clearly understand that it will be far more than a "map" of transportation facilities. The NTS will instead be a powerful analytical tool that will enable us to project—far more accurately than we can today—the impact of changes in transportation policies or investments on people, businesses, and communities.

For example, the NTS will allow us to gauge how changes in the quality and quantity of transportation services affect the economy, the environment, and the social fabric of the Nation. The NTS will allow Federal, State, and local transportation planners to project changes in economic and population patterns so that they can anticipate, plan for, and meet the changing transportation needs of the communities we serve.

It will enable all levels of government to do a better job of creating a seamless, efficient, safe, environmentally sound transportation system for America. One reason is that the NTS will provide common ground for cooperation and partnership between Federal, State, and local officials in creating an integrated multimodal transportation system. The NTS will be related closely and consistently to the State and local planning processes set forth in ISTEA and it will improve the ways that those processes address multimodal and multistate transportation issues.

When it is in place and functioning, the NTS will affect all of us on a daily basis. For business and pleasure travel, we will be able to select the best mode and spend less time in inconvenient connections. This means more productive business trips and more time to enjoy personal travel. Our industries will be able to move their products to retail outlets or to export to other countries using the transport modes that best suit their needs and with less delay, wasteful paperwork, and transfers. This will produce greater efficiencies for industry, improved competitiveness, and more American jobs.

The NTS Development Process

In developing the NTS we will consider issues ranging across all aspects of Federal transportation policy—and we will do that with full public participation. The ***National Performance Review*** stated that "Government must have a new customer service contract with the American people...a new guarantee of effective, efficient, and responsive government that puts our customers first."

That is what will guide us in formulating the NTS. To ensure maximum clarity and public engagement, I have directed DOT staff to begin a wide-ranging, collaborative process with the Congress, Federal Agencies, State and local officials, transportation industry representatives, and transportation users to refine the concept, goals, criteria, and timetable for the development of the NTS.

To provide an initial focus for discussion, the DOT is already working on a proposed NTS concept and development plan. We believe that it is important to be as thorough as possible in describing our preliminary ideas on the NTS so that the public can address these ideas explicitly. Throughout this public dialogue the DOT will be seeking views as to what the NTS should consist of, how it should be used, and how all parts of the transportation community—public and private—should be involved.

After extensive public discussion, we plan to develop a set of system parameters to provide, with advice from local transportation firms and consumers, consistent criteria for State and local officials to use in "nominating" transportation components within their States for inclusion in the NTS. Developing consistent criteria across the modes will be difficult, but it is crucial to ensure a balanced, coherent system. The DOT will then review and discuss NTS nominations with affected parties both to ensure consistency and equity among States and regions and to see that each element of the NTS does, in fact, address significant "national" objectives.

We encourage public participation in the "nominating" process, making sure that private sector transportation providers are involved, particularly those already operating on a national scale. We will also draw on the State and local multimodal planning processes established in ISTEA for both the initial system nominations and for any changes to the NTS which might be needed over time to ensure that the NTS continues to be relevant to the Nation's social and economic objectives.

Even as we develop the NTS, the DOT will be working to make our existing policies and programs more consistent with the emerging NTS concept. We will view legislation to revise or reauthorize current programs as opportunities to bring transportation planning and program structures into closer harmony.

When the NTS is fully developed, it will, of course, play an integral role in shaping future Federal policies, regulations, and legislative proposals. For the first time in our Nation's history, the NTS will enable us to craft a true comprehensive "national" transportation strategy—not a patchwork of individual facilities and projects or even mode-by-mode plans.

Implications of the NTS Concept

The NTS concept raises complex issues of effective program structure, funding eligibility, and the Federal role in transportation. It is not intended, however, to result in increased centralization or any diminution of the decision-making authority of State and local officials. Rather, a major objective is to provide those officials with additional tools and funding flexibility to address local transportation problems more efficiently.

Identification of an NTS does not mean that Federal funding would be available only for NTS components. As in the case of the NHS, the NTS will delineate a system that serves national objectives. It will not define the limits of national interest or of Federal funding participation.

I further intend to see that development of the NTS provides an opportunity to build upon the public-private partnership that ISTEA fosters. Involvement of the private sector in developing the NTS will be essential because many of the modal and intermodal components of the system (e.g., railroads, pipelines, intermodal facilities, etc.) are privately owned.

With the release of this report on the NHS, we are carrying out ISTEA's mandate. In our effort to develop an NTS we will be continuing to pursue the objective of an integrated transportation system which was so much at the heart of ISTEA. I look forward to working with the Congress in gaining legislative approval of the NHS and in the development of the NTS.

Properly conceived and implemented, the NTS concept can significantly improve the efficiency and effectiveness of our entire country's transportation system and, thus, the strength and competitiveness of our economy, the vitality of our communities, and the quality of life for all Americans.

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REPORT TO CONGRESS ON THE
PROPOSED NATIONAL HIGHWAY SYSTEM

EXECUTIVE SUMMARY

Pursuant to Section 1006(a) of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the U.S. Department of Transportation (DOT) proposes a National Highway System (NHS) of nearly 159,000 miles (about 256,000 kilometers). Specific legislative language to enact the NHS and continue the intermodal integration of the NHS is included in this report. This NHS is the first major component of a larger, fully coordinated, and integrated National Transportation System (NTS) that will meet the evolving transportation needs of the Nation as we enter the 21st century.

The NTS will have as its goal the creation of a unified, interconnected system of modal facilities and services that accommodates national and regional transportation demands, both freight and passenger. The NTS will embrace the principles of ISTEA which encourage those investments that innovatively address transportation needs, support national defense, enhance the quality of life, and support commerce crucial to our national economic growth and our competitive posture in a global economy.

The NTS will be developed by the DOT beginning early next year through an extensive outreach process that will involve collaboration with the Congress and with the States, local governments, and other public and private organizations. As a first step, the process will focus on innovative solutions to existing and emerging infrastructure issues.

Within an NTS context, the rationale for designation of an NHS is to focus Federal attention on a subset of the Nation's 3.9 million miles (6.3 million kilometers) of public roads. The NHS will include roads that serve and will continue to serve a large percentage of the Nation's highway travel and associated strategic priorities. It will also emphasize connections from the NHS to major military installations, border crossings, airports, ports, and rail-highway transfer facilities. The proposed NHS is mostly existing highways; less than 2 percent is new mileage, with this new mileage based on existing State plans or implementation activity. Including connections to intermodal facilities, the NHS provides a significant step in defining the NTS.

Development of the NHS proposal has been coordinated among all modal administrations within the DOT and with all State transportation agencies. The State departments of transportation coordinated their NHS development work with metropolitan planning organizations, regional planning agencies, Indian tribal governments, other State agencies, and local officials. These efforts ensured that the NHS would be integrated with the Nation's major intermodal facilities through a broad-based participatory process.

The NHS will establish eligibility for the use of Federal-aid highway funds but will not result in a commitment to funding individual projects. Designation is only the first step in development of the NHS. Projects advanced on designated NHS routes will be subject to all applicable Federal requirements including the National Environmental Protection Act, ISTEA, and the Clean Air Act Amendments of 1990.

Environmental studies will be performed at the planning and project development stage to ensure full consideration of environmental factors and compliance with applicable laws and policies.

The proposal will advance the development of initiatives that incorporate modern safety and operational features appropriate to the function of each portion of the system and are consistent with expected volumes, traffic mix, and speed. The NHS will support the incorporation of Intelligent Vehicle Highway System advanced technologies, including those from defense research. The proposal will also allow flexibility to add sections (e.g., to accommodate new connections with major intermodal facilities) and to delete sections that are no longer considered a priority. It will allow the flexibility to respond to changes that will inevitably occur. Such needs could include facilitating economic growth and responding to national emergencies.

Subsequent to designation, the DOT will work with the Congress and States, local government organizations, and other public and private organizations to develop or refine, as appropriate, goals, policies, standards, and guidelines relating to the performance, operation, maintenance, and special identification of the NHS.

As envisioned, the NHS will become the Nation's premier highway system, which will connect with other modes of transportation. As a logical post-North American Free Trade Agreement step, designation will begin to make an immediate contribution to advancing North American trade and to promoting travel and tourism. The other principal contributions will be to facilitate sustainable economic growth by enhancing intermodal and highway system connections, improving productivity and efficiency of commercial vehicle operations, advancing safety, alleviating congestion, supporting the national defense, and improving system performance. While serving national productivity goals, the NHS will enhance the quality of life.

I. INTRODUCTION

The Secretary of Transportation is required by the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Public Law (P.L.) 102-240, to submit, to the Committee on Environment and Public Works of the Senate and to the Committee on Public Works and Transportation of the House of Representatives, maps and listings of a proposed National Highway System (NHS). This report was prepared to accompany the maps. The purpose of the report is to explain how the U.S. Department of Transportation (DOT) arrived at the recommended system, to describe the features of the system, to emphasize the benefits of an NHS, to recommend legislative language to establish the system, and, finally, to provide information about the NHS related to a request in the Senate Appropriations Committee Report 103-150 on the 1994 DOT Appropriations Bill.

This report focuses on the establishment of the NHS and does not propose changes in the programs established by ISTEA. The DOT believes that program aspects of the NHS should be considered in the context of the total Federal-aid highway program. Thus, this report does not address changes, such as revision in the distribution of funds and changes in NHS project eligibilities.

A significant aspect of the NHS proposal is its relation to a National Transportation System (NTS). The ISTEA declared that it is the policy of the United States to develop a National Intermodal Transportation System (referred to as the NTS in this report). The identification of the NHS and its intermodal connections is an important first step in achieving the goal of an efficient, cost-effective, and integrated NTS.

An NTS will support the smooth flow of people and goods. In developing this NTS, the DOT will build upon the ISTEA themes and, in particular, the public-private partnership. This public-private partnership approach is essential because many modal and intermodal facilities (e.g., railroads, ports, interstate bus service, pipelines, and rail-highway transfer facilities) are owned and/or operated by the private sector. The DOT, beginning early next year, will develop a collaborative process for consulting with customers and users of the transportation system to identify and address intermodal and multimodal issues. From this customer/user perspective, important specific institutional, legislative, regulatory, and other considerations will be identified and an appropriate course of action will be determined.

Because the NHS, including its intermodal connections, is an important step in the eventual development of the NTS, this report not only focuses on the importance of the NHS to highway transportation but also places the NHS in the context of the overall transportation system in the United States and the economy.

II. LEGISLATIVE MANDATE

Section 1006(a) of ISTEA directs the Secretary of Transportation to submit, for approval, a proposed NHS to the Congress by December 18, 1993. According to ISTEA, the purpose of the NHS is:

> *...to provide an interconnected system of principal arterial routes which will serve major population centers, international border crossings, ports, airports, public transportation facilities, and other intermodal transportation facilities and other major travel destinations; meet national defense requirements; and serve interstate and interregional travel.*

Moreover, ISTEA states that the NHS is part of the National Intermodal Transportation System which is to include other modes of transportation in a unified, interconnected manner as well as the transportation systems of the future.

As stated in Section 1006(a) of ISTEA, the NHS is to be limited to 155,000 miles (249,448 kilometers), with allowance to increase or decrease this amount by no more than 15 percent. The NHS is to include:

a. The Interstate System (including mileage added pursuant to Title 23, U.S.C. 139),

b. Other principal arterials, both urban and rural, and highways providing access to major intermodal facilities (e.g., ports, airports, public transportation, railroad terminals),

c. The Strategic Highway Network (STRAHNET) and major STRAHNET connectors important for the essential movement of defense-related personnel, materiels, and equipment, and

d. High-priority corridors identified in Section 1105(c) of ISTEA, as amended.

In addition, ISTEA states that an illustrative map submitted by the Secretary of Transportation to Congress in 1991 is to serve as a basis for the States in proposing arterials and highways for designation.

Also, Section 1006(c) of ISTEA required the States to complete a functional reclassification of all public roads and streets, and the Secretary to approve the reclassification made by the States and submit a report to Congress containing the reclassification. The reclassification results are presented in a separate report to Congress. Functional classification is a way of identifying the relative importance of streets and highways. The national reclassification mandated by ISTEA identified rural and urban principal arterials eligible for the NHS. A summary of the results of the reclassification is provided in Section IV. B., "Development of State NHS Recommendations."

III. BACKGROUND

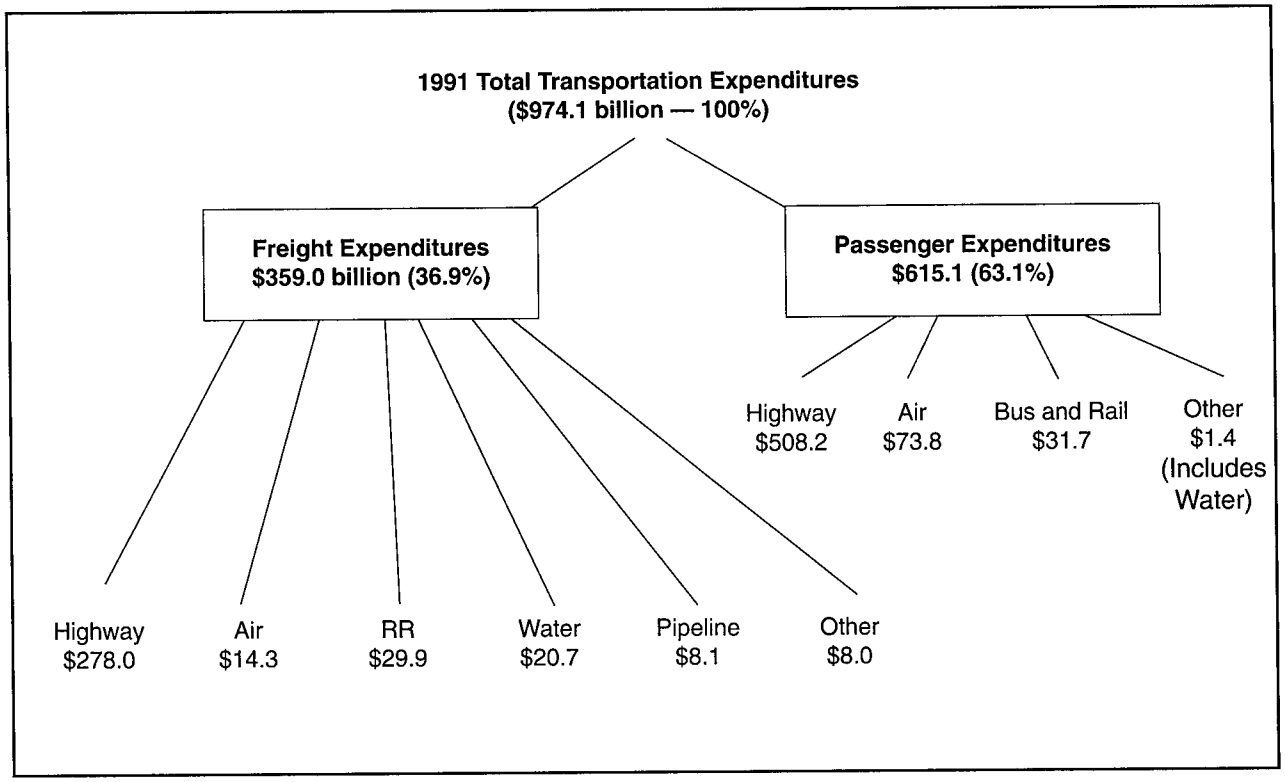
A. TRANSPORTATION AND THE ECONOMY

The movement of people and freight is of critical importance to the economic well-being of the United States. Our national productivity depends on fast and reliable transportation. All users of the transportation system collectively spend nearly a trillion dollars annually on total direct outlays for transportation, the equivalent of nearly 17 percent of the gross domestic product (GDP). The cost of these services includes user expenses such as vehicle costs and operating expenses, transit fares, and accident costs.

In virtually every sector of our Nation's economy, productivity depends on adequate transportation services. This is nowhere more important than in the area of freight transportation, where expenditures are nearly $360 billion annually, more than 6 percent of GDP. Over 40 percent of freight ton-mileage is carried over our highways. New manufacturing processes emphasizing just-in-time delivery of inventory place a premium on fast, frequent, and dependable transportation, a goal met by the speed and flexibility of highway freight transport.

Highways are also important for transporting people, with total expenditures for passenger travel exceeding $615 billion annually. In 1990, over 80 percent of intercity passenger miles of travel occurred on the Nation's roads and streets, more than four times the amount by air, the second most frequently used mode of intercity travel.

This information on transportation service relationships was derived from a report by the ENO Transportation Foundation, Inc., entitled *Transportation in America: 1993, 11th Edition*, and is shown in the following figure:



B. HISTORICAL PERSPECTIVE OF THE FEDERAL-AID HIGHWAY PROGRAM

Concentrating Federal assistance on roads that are important in carrying out national objectives has been a characteristic of the Federal-aid highway program since 1921. The Federal Highway Act of 1921 signaled the beginning of substantial Federal involvement in the provision of financial assistance to States for road building. This early legislation was designed to ensure an interconnected system of interstate and intercounty roads. The system, limited to 7 percent of total existing rural road mileage, was to be designated by the States, in consultation with the Bureau of Public Roads (BPR), the predecessor agency to the Federal Highway Administration (FHWA). The focus of Federal assistance on these routes resulted in the development of an integrated, interstate network of improved highways.

As the Nation changed, this first system was no longer able to serve total travel needs, including commerce, personal travel, and defense. By the 1930s, travel had grown such that the existing Federal-aid system was deemed inadequate, especially for longer distance travel. As the need for interregional facilities became evident, the concept of an interstate highway system gradually took shape. The BPR 1939 report, *Toll Roads and Free Roads*, recognized the impracticality of nationwide toll financing but advocated a national system of access-controlled roadways to serve mostly commercial purposes. In 1941, President Franklin D. Roosevelt appointed a National Interregional Highway Committee, chaired by Commissioner of Public Roads Thomas H. MacDonald, to investigate the need for and character of a limited system of national highways. The system was intended to improve interregional transportation and to use some of the workers and industrial capacity available at the end of World War II. The committee's 1944 report recommended a system of 33,920 miles (54,589 kilometers).

The Federal-Aid Highway Act of 1944, using the report of the National Interregional Highway Committee as a basis, provided for a National System of Interstate Highways. This national system was not to exceed 40,000 miles (64,374 kilometers), and was to be designated by the joint action of the State highway departments and the BPR. The resulting system was 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."

Little progress was made on the system until President Dwight D. Eisenhower signed P.L. 84-627, the Federal-Aid Highway Act of 1956. This Act authorized creation of the Highway Trust Fund, dedicated an increased Federal motor-fuel tax and other highway user taxes to the Fund, established a Federal matching ratio of 90 percent for work on the Interstate System, and authorized substantial additional funds for Interstate construction. In fact, while the 1955 Interstate System authorization was only $25 million, the 1957 authorization was $1.2 billion. The provisions of the 1956 Act reflected the desire to boost the national economy and bolster national defense. Thus began the era of Federal-Aid Interstate System construction.

For the next 30 years, the Interstate System was the centerpiece of the Federal-aid highway program. From 1957 through 1995, about $115 billion, representing 33 percent of total Federal-aid highway funding, has been authorized for Interstate construction. The Federal-Aid Highway Act of 1976 provided funding for the resurfacing, restoration, and rehabilitation (3-R) of the Interstate System. The Federal-Aid Highway Act of 1981 expanded the Interstate 3-R program to a 4-R program, with the addition of reconstruction as an eligible activity. The ISTEA retained much of the substance of the previous Interstate 4-R legislation, but changed the name to the "Interstate Maintenance Program." About $43 billion has been authorized for 3-R, 4-R, and Interstate Maintenance for fiscal years (FYs) 1977-1997, representing about 15 percent of total Federal aid for highways authorized during this period.

In 1966, when more than half of the Interstate mileage had been completed, the Interstate System carried over 99.3 million vehicle miles of travel

(VMT) which was 11 percent of the national VMT. Today, now that the Interstate System is virtually completed, the Interstate System carries more than 22 percent of the Nation's traffic, and 40 percent of the Nation's heavy truck traffic on only 1 percent of the Nation's total road and street mileage. The Interstate System currently serves the 48 contiguous States, Alaska, Hawaii, the District of Columbia, and Puerto Rico. Indeed, the Interstate System had become recognized as the Nation's "Main Street," connecting 286 of the 366 cities with populations over 50,000 (1980 Census) and 45 of the 50 State capitals, as well as Washington, D.C.

C. THE NHS CONCEPT AND RATIONALE

In the late 1980s, the FHWA, representatives of State and local governments, and transportation associations such as the American Association of State Highway and Transportation Officials (AASHTO) began assessing U.S. highway transportation to chart the direction of the future Federal-aid highway program.

These assessments revealed a number of concerns:

- Some areas, primarily due to demographic and land use changes, were underserved by existing facilities,
- New trends in production and distribution technology created transportation needs for some portions of national commerce,
- Congestion, generated by growth in number of vehicles and VMT, was adversely affecting national productivity, competitiveness, and environmental quality,
- Connections between highways and facilities such as major ports and airports were inadequate in many cases,
- Highways did not adequately serve some emerging international trade corridors,
- The highway system needed to serve defense movements more effectively in a national emergency,
- Highway-related injuries and fatalities, although declining, were continuing to exact an unacceptable toll on the well-being of the Nation, and
- Community values and quality of life concerns were becoming ever more important in the evaluation of alternatives to improve transportation.

Out of these concerns arose the concept of an NHS, grounded in the desire to focus a portion of the limited Federal assistance on strategic investments, with a goal of overall system efficiency and performance.

D. CONGRESSIONAL REQUEST FOR ILLUSTRATIVE NHS

In the spring of 1990, in response to a request from the Committee on Public Works and Transportation, U.S. House of Representatives, the FHWA began working with AASHTO, the National Association of Regional Councils (NARC), individual State transportation agencies, and metropolitan planning organizations (MPOs) on the structure of an NHS. A process was developed for identifying a preliminary NHS consisting of those roads having the highest level of national significance, serving the Nation's principal cities and major manufacturing centers, supporting national defense needs, and fostering connectivity with other modes.

The FHWA, in consultation with the States and MPOs, developed an illustrative NHS. In February 1991, the illustrative system was sent to the House Committee on Public Works and Transportation and the Senate Committee on Environment and Public Works. The illustrative NHS served as a resource for deliberations by Congress and, thus, eventually led to the provision found in Section 1006(a) of ISTEA requiring the Secretary of Transportation to submit a proposed NHS to Congress.

IV. PROCESS

Development of the proposed NHS was carried out by the DOT through the FHWA in cooperation with the States. The stages of the process overlapped to some extent but can be divided into three parts: 1) the illustrative system, 2) development of State recommendations for the NHS, and 3) FHWA review and development of the final NHS proposal.

A. THE ILLUSTRATIVE SYSTEM

The illustrative system served as the foundation for the NHS. The FHWA and the States cooperatively developed this preliminary system based on criteria of efficiency, connectivity, and equity among States. State and local officials were actively involved in the process, especially in the identification of routes.

Efficiency, Connectivity, and Equity

The FHWA determined that traffic volume, service to destination points, and interstate, intrastate, and interregional connectivity were useful initial indicators of efficiency. These indicators were to become analytical criteria for including individual routes in the illustrative system. Another important element was to consider mileage distribution among States and between urban and rural areas.

Road density (miles of road per square mile of land area), travel density (VMT per mile of roadway), and percentage of statewide travel served were the major factors used to achieve rural mileage equity among the States.

To establish the urban mileage targets, the FHWA analyzed several proposed systems submitted by States and MPOs representing urbanized areas of varying sizes. The FHWA analyzed the ability of these systems to connect with important interstate and intrastate routes and to serve major traffic generators within the urbanized areas. Based upon this analysis, the FHWA identified an NHS urban mileage target of 6 percent of total urban road and street mileage. This provided an equitable system for all States and provided travel service consistent with the rural component.

Route Identification

Cooperation among the States over many years had resulted in generally recognized interstate and interregional routes that connected across State borders. However, in a few cases, inconsistencies between State routes existed. The FHWA consulted with the States and made determinations of routes to be included based on considerations such as traffic volumes, connectivity and service to destinations as well as inclusion of routes in existing State long-range plans.

These consultations involved numerous meetings that included State and other officials, e.g., municipal, county, and Indian tribal governments. Specific rural routes were included on the national map of the illustrative system. Urban routes, other than urban Interstates, were not identified on the national map, but in many areas, local maps or listings were created and eventually used in the development of the NHS. This process yielded the illustrative NHS which was submitted to Congress in 1991.

B. DEVELOPMENT OF STATE NHS RECOMMENDATIONS

Section 1006(a) of ISTEA directed the DOT to use the illustrative system as the starting point for developing the proposed NHS. The instructions provided by the FHWA to the States clearly established the illustrative system as the benchmark for mileage, but allowed additional routes to be submitted for consideration with supporting justification.

Functional Reclassification

Section 1006(c) of ISTEA also required the States to complete a functional reclassification of all public roads and streets and required the Secretary of Transportation to use the functional reclassification in preparing the proposed NHS. The most recent comprehensive national reclassification had been completed in the mid-1970s.

Reclassification was important for the NHS designation process because it identified roads eligible for designation as NHS routes. Generally, as specified in the ISTEA, only principal arterials are eligible as NHS routes.

Functional classification groups roads and streets into three basic categories — arterial, collector, and local. The basic principle in classifying highways is that roads serve two functions or purposes: moving traffic and providing access to adjacent land use. Although most roads serve both functions, classification is determined by the degree to which one function predominates.

Although local roads provide the most local land access and collectors funnel traffic from local roads to arterials, it is arterials that carry the most traffic. The function of arterials is to move large numbers of people, goods, and vehicles quickly from one place to another. They are characterized by long-distance travel, high traffic volumes, and higher speeds. As a result, they generally are constructed to higher design standards than other routes. Principal arterials are the most important of the roads classified as arterials.

The reclassification was carried out by the States in cooperation with local officials. The results of the reclassification are presented in a separate report to Congress. The following table summarizes the results.

1993 National Summary of Mileage/Kilometers and Travel by Functional Highway System (Includes Puerto Rico and the District of Columbia)

Functional System	Miles/ *Kilometers*	Cumulative Percent of Total	Vehicle Miles/ *Kilometers* of Travel (millions)	Cumulative Percent of Total
RURAL AREAS				
Interstate	32,592 ***52,452***	1.0	198,644 ***319,687***	22.8
Other Principal Arterials	97,348 ***156,666***	4.2	196,377 ***316,038***	45.4
Minor Arterial	139,146 ***223,934***	8.6	149,899 ***241,239***	62.6
Major Collector	434,684 ***699,556***	22.5	179,176 ***288,356***	83.2
Minor Collector	284,187 ***457,355***	31.6	48,447 ***77,968***	88.8
Local	2,132,326 ***3,431,646***	100.0	97,325 ***156,629***	100.0
RURAL TOTAL	3,120,283 ***5,021,609***	100.0	869,870 ***1,399,920***	100.0
URBAN AREAS				
Interstate	13,034 ***20,976***	1.6	305,149 ***491,090***	21.8
Other Principal Arterials	64,111 ***103,177***	9.6	512,271 ***824,420***	58.3
Minor Arterial	86,779 ***139,657***	20.4	275,528 ***443,419***	77.9
Collector	85,547 ***137,675***	31.0	118,287 ***190,364***	86.3
Local	554,076 ***891,699***	100.0	191,313 ***307,888***	100.0
URBAN TOTAL	803,547 ***1,293,184***	100.0	1,402,548 ***2,257,182***	100.0
NATIONAL TOTAL	3,923,830 ***6,314,792***	—	2,272,418 ***3,657,102***	—

Note: Vehicle miles/kilometers traveled in 1991; columns and rows may not sum exactly because of rounding; Other Principal Arterials means other (non-Interstate) principal arterials; Urban Areas are areas defined by the U.S. Department of Commerce, Bureau of the Census as having more than 5,000 population.

State Process

The States, in cooperation with officials from other units of government, developed their proposed systems using the illustrative system as a starting point. The functional reclassification also set limits on the routes that the States could incorporate into their recommended systems. Because the functional classification was due from the States at the end of 1992, and the NHS recommendations were due from the States on April 30, 1993, the two efforts were conducted simultaneously in many States. While they were developing NHS proposals, State transportation representatives and other officials were actively considering implications of Federal rulemaking activity on the statewide and metropolitan transportation planning processes established by ISTEA. Thus, officials involved with the designation proposals were able to rely on interactive networks used in coordinating the overall planning processes.

Involvement of State and Other Officials

Providing an opportunity for active involvement by State and other officials throughout the development of the proposed NHS was an important objective of the FHWA. While emphasizing the importance of such involvement, the FHWA did not prescribe procedures for the States to follow. Instead, the States were able to use approaches that best suited their individual needs and situations.

This approach proved successful as reflected in a survey the FHWA conducted of the role of this involvement. Based on this survey, the FHWA found that MPOs played an important role in developing the proposed systems in all States. Involvement varied from commenting on routes proposed by the State to identification of a proposed system or of candidate routes. Although required neither by ISTEA nor by the FHWA, in over 30 States every MPO endorsed/approved the State-submitted NHS.

Approaches to involve officials in nonmetropolitan areas (e.g., municipalities, counties, Indian tribal governments) also varied from State to State. In some cases, State officials met with individual officials or groups of officials to discuss the proposed system and obtain input. In other cases, the State sent information about the NHS to officials and requested comments. In some States, legislative action established advisory boards or adopted State transportation plans relating to the NHS. Furthermore, public hearings or meetings were held in a number of States. Based on the responses to the survey and information accompanying the State submissions, the FHWA determined that each State provided substantial opportunities for the MPOs and other officials to provide input during the development of the proposed NHS. Overall, a high level of involvement was achieved.

State Submissions

In June 1992, the FHWA asked the States to submit recommended systems by April 30, 1993, based on rural and urban mileage targets. All States submitted recommended systems, including appropriate maps, mileage summaries, and listings of routes, as requested.

The basic systems submitted by the States totaled almost 146,500 miles (almost 235,800 kilometers)—about 3,400 miles (about 5,500 kilometers) less than the total rural and urban mileage targets. This smaller basic system occurred because several States, particularly California and Florida, proposed urban components significantly less than their target mileage.

At the same time, the States were given an opportunity to submit, for consideration, additional principal arterial routes that exceeded their assigned mileage targets. Ultimately 43 States took advantage of this opportunity to propose additional routes totaling about 15,000 miles (about 24,000 kilometers), over and above the 146,500 mile (about 235,800 kilometers) basic system.

C. DEVELOPMENT OF THE FINAL NHS PROPOSAL

After receipt of the States' submissions, the FHWA evaluated these recommendations in relation to the criteria and objectives contained in Section 1006(a) of ISTEA. Careful consideration was given to each State's rationale for including routes that exceeded the mileage targets, mileage distribution among the

States, STRAHNET routes, connectivity of routes, existing and emerging trade corridors with Canada and Mexico, the high priority corridors identified in Section 1105(c) of ISTEA, as amended, and intermodal connections.

Working with the State submissions, the FHWA identified a draft recommended system that was discussed with State officials at the AASHTO Annual Meeting in October 1993. These discussions, which were held with officials from virtually every State, resulted in additional adjustments to achieve greater conformity with State highway plans. Thus, the final proposed system reflects the results of a continuing process of consultation with the States.

State Rationale

States, as requested, provided justification for routes that exceeded their assigned mileage targets. This included information on routes serving recreational travel and tourism, new routes or routes planned for major improvements in existing State plans, corridors in which substantial economic growth was expected, routes traveled by larger trucks, and routes serving major employers. This information was, in some cases, critical in evaluating proposals.

Mileage Distribution

Considerable attention had been given to the objective of system equity in defining the process for allocating mileage to the States; this remained a major focus in developing the final proposed system. In arriving at the final proposed system, the FHWA attempted to ensure that the NHS mileage within each State was consistent with other States with similar characteristics.

Although the total basic mileage of about 146,500 miles (about 235,800 kilometers) proposed by all States was well below ISTEA's upper limit of 155,000 miles (249,448 kilometers) plus no more than 15 percent, the FHWA determined that system equity would be compromised by including all additional routes submitted by the States on the final proposed system. The FHWA concluded, however, that about 12,200 miles (about 19,600 kilometers) of the nearly 15,000 miles (nearly 24,000 kilometers) proposed by the States should be included to meet NHS objectives fully and to achieve system continuity. The final proposed system reflects these adjustments.

STRAHNET

As required by Section 1006(a) of ISTEA, the final proposed NHS includes the STRAHNET and major STRAHNET connectors. These routes were identified over a 3-year period by the Department of Defense (DOD), Military Traffic Management Command (MTMC), and the FHWA in consultation with the State transportation agencies. The STRAHNET routes and major STRAHNET connectors included in the proposed NHS are consistent with the base relocations and closures approved by the President and the Congress through November 1993.

The routes in the 61,000-mile (98,170 kilometer) STRAHNET include the Interstate System and about 15,500 miles (about 25,000 kilometers) of other arterial routes. These routes are listed in the report entitled, Strategic Highway Corridor Network, (MTMC Report SE 89-4b-27, as amended). In addition, there are nearly 2,000 miles (nearly 3,200 kilometers) of major STRAHNET connectors which serve all priority one and two military installations. These are listed in the report entitled STRAHNET Connector Atlas (MTMC Transportation Engineering Agency Report SE 89-4b-59, as amended).

System Connectivity

The importance of an interconnected system was stressed in the FHWA's instructions to the States. Each proposed route was carefully evaluated by the FHWA to ensure system connectivity, particularly at State lines.

Trade Corridors with Canada and Mexico

In developing the proposed NHS, the FHWA gave substantial attention to including significant trade routes linking the United States with Canada and Mexico. Specifically, the proposed NHS connects with the Canadian National Highway System at

U.S./Canadian border crossings and with major north-south corridors leading into the heartland of Mexico at U.S./Mexican border crossings. In addition, the proposed NHS connects with nonborder ports of entry such as major ports and airports.

High Priority Corridors

The final proposed NHS includes the 21 high priority corridors specified in Section 1105(c) of ISTEA, as amended by Section 351 of P.L. 102-388 (the 1993 DOT and Related Agencies Appropriations Act, enacted October 6, 1992). Specific alignments are shown for most of the corridors; however, a few are not specifically identified pending the completion of feasibility studies required by Section 1105(h) of ISTEA. These include the East-West Transamerica Corridor; a portion of the corridor from Indianapolis, Indiana, to Houston, Texas; a portion of the Heartland Expressway from Rapid City, South Dakota, to Denver, Colorado; and a portion of the I-73/74 North-South Corridor from Charleston, South Carolina, to Detroit, Michigan.

Intermodal Facilities and Connections

Based on ISTEA's statutory language, two important factors emerged in considering intermodal NHS connectors.

a. Routes that are intermodal connectors need not be classified as principal arterials to be included in the NHS.

b. Intermodal facilities connected to the NHS must be major facilities.

The FHWA instructions to the States issued in June 1992 did not define "major." The FHWA determined that the States and the MPOs, which were engaged in carrying out the planning activities required by ISTEA, were in the best position to decide which intermodal facilities were major. However, when the maps were submitted, the results of this effort were not sufficiently consistent to warrant final designation of specific connectors to major intermodal facilities as part of the proposed NHS. Some States and MPOs gave considerable attention to identifying ports, airports, etc., and providing access where appropriate. Others gave less attention to this subject.

This variation occurred for several reasons. One was that, as noted above, the FHWA had not established a definition of the word "major." Another was that the illustrative NHS had not emphasized intermodal terminals. Still another was that the statewide and metropolitan planning processes were, in some cases, just beginning to come to grips with intermodal issues.

Consequently, the FHWA, in cooperation with other DOT modal administrations and with the private sector, established a preliminary list of facilities sufficiently important to be illustrated in the NHS presentation required by ISTEA. These facilities are described in Section VII. B., "System Summary."

Notwithstanding the illustrations on the maps, the DOT does not intend for the maps to imply that access routes will be limited to those which connect these specific facilities, or that access must be identified for every illustrated facility. Instead, as discussed in Section VII. B., "System Summary," the DOT proposes that the States, in cooperation with the MPOs and other officials, be required, within 2 years of enactment of the NHS, to identify major intermodal facilities and appropriate access based on criteria to be established by the DOT. Because the NHS connections with other modes of transportation are important to the concept of an NTS, the DOT considers this additional requirement necessary.

Finally, the DOT recognizes that periodic review of intermodal facilities is a function of the continuing statewide and metropolitan planning processes (including development of intermodal management systems and attention to environmental and other considerations) required by ISTEA. Proposed legislative language in Section VIII., "Legislative Language to Enact the NHS," allows for this periodic review as well as the identification of major intermodal facilities and appropriate access.

V. ECONOMIC BENEFITS OF AN NHS

Although the NHS will have benefits such as advancing trade and tourism, facilitating defense mobilizations and emergency evacuations, and enhancing the environment, the benefits most universally delivered to the customers and users of the NHS will be economic. The economic benefits of highway improvements include, for example, transportation time savings through alleviating congestion and bettering system performance, improved landside port access, enhanced safety, and vehicle operating cost reductions (through reduced vehicle wear and tear and through fuel savings). In addition to these benefits, highway improvement programs leading to improved system performance increase the efficiency with which goods are moved. This leads directly to reductions in the cost to provide transport services. Particularly in highly competitive markets, such as the trucking industry, these cost savings are passed along to shippers, who in turn pass the savings on to consumers in the form of lower costs for goods and services.

More indirectly determined are the benefits attributable to quality transportation services that are a necessary condition for businesses and consumers to improve the efficiency of their activities. Low-cost, reliable, and flexible transport enables firms to minimize overall logistics costs, adopt just-in-time control systems, and design distribution systems that maximize their production and marketing capabilities.

The NHS reflects changes in our economic geography, population centers, manufacturing centers, and distribution systems since the Interstate System was authorized in 1944. Throughout the era of Interstate design and construction, highways facilitated strong interstate and interregional linkages among the economic centers of the Nation in ways unforeseen when the system was conceived. This "connectivity" facilitated the rapid economic growth experienced in this country throughout the last 30 years. However, rigorous international competition and new industrial processes and priorities in this country have occurred since the 1950s.

In recognizing future travel and trade patterns and the needs that have evolved beyond those that drove the design of the Interstate, the NHS will strengthen sustainable economic growth and integration of the Nation in the century ahead. Designation of the NHS is an important step in responding to today's and tomorrow's needs.

Major U.S. employers attest to the importance of highway transportation to their business operations. For example, representatives of retail, industrial, and other employers stress their need for a predictable, consistent, and reliable delivery system, and their specific use of highways to meet this need. They rely on highways to allow the use of modern management techniques; to use intermodal options (such as shipping containers via rail for long line haul portions of trips); to maintain reliability; to control costs and improve productivity; to attract quality employees; to serve new customers and markets; and to maintain and increase employment, production, and service.

Physical infrastructure is but one essential element of the transportation system. The increasing trend toward a global economy, exemplified by the North American Free Trade Agreement, illustrates the need to integrate the U.S. transportation network with that of neighboring countries and other international markets. To adapt to these trends, the NHS integrates the Nation's highway system with the highways of Canada and Mexico, and strengthens links with major ports, airports, public transportation facilities, and other major intermodal facilities. This linkage ultimately will maximize national productivity and international competitiveness by providing industry with the opportunity to use intermodal suppliers and to eliminate existing barriers to intermodal exchange.

Congestion and associated loss of time are critical problems to employers and highway users. The concentration of Federal-aid on the most important highways provides the opportunity to reduce traffic congestion at key points by targeting current and projected bottlenecks. Using a systems management approach, decision-makers will take into account alternatives, such as Intelligent Vehicle Highway System (IVHS) applications, incident management programs, ridesharing strategies, or congestion pricing, to maximize capacity on the NHS.

Because transportation plays a central role in the Nation's economy, designating a premier highway system to be consistent with the needs of employers and employees and those of suppliers and customers, will improve the delivery of goods and, in turn, provide opportunities to improve American productivity and competitiveness into the 21st century.

VI. STRATEGIC AND EMERGENCY PREPAREDNESS IMPLICATIONS

The dramatic geopolitical changes that have occurred during the past few years have caused significant revisions in our national military strategy. As the United States withdraws many of its forces from overseas bases, the DOD will rely more on forces stationed in the continental United States. Mobilizing and rapidly deploying these forces to ports of embarkment in response to overseas crises are critical to our defense posture. The importance of this rapid response was clearly evident during Desert Shield/Desert Storm. Evolving defense strategies around the world will continue to place unique demands on our transportation system, particularly on some of our highways.

The Interstate System has provided the backbone for supporting our defense requirements in the past, and it will continue to do so in the future. However, the system has some critical gaps from a strategic military standpoint. Consequently, the DOD has identified a system of interconnected routes, including the Interstate System, known as the STRAHNET. The STRAHNET is a key element of the NHS. The DOD estimates that half the equipment tonnage required to support a full-scale mobilization of active and reserve forces would be moved over the STRAHNET and its connectors, which are components of the NHS.

In addition to defense mobilization, the NHS serves as a network of emergency evacuation routes to respond to natural disasters, such as hurricanes, tornados, floods, fires, volcanic eruptions, and earthquakes.

VII. RECOMMENDATIONS

A. RECOMMENDED SYSTEM

The DOT recommends that the Congress approve the NHS as represented by the national and State maps transmitted with this report and as supplemented by urbanized area maps and route listings to be submitted by February 1, 1994. Although the proposed NHS is the product of a careful deliberative process involving the FHWA, the States, the MPOs, and others, some refinements may be necessary after the submission to Congress to reflect minor changes and adjustments. Accordingly, the FHWA intends to periodically update the maps, as warranted, for the Senate Committee on Environment and Public Works and the House Committee on Public Works and Transportation after the submission to the Congress.

The DOT further proposes that after initial designation, the Secretary have the flexibility to adjust the system to accommodate future needs, such as for new facilities, arising in response to changes or shifts in population, defense logistics, intermodal transportation demands, patterns of international and domestic commerce, and changed community priorities. In view of these changing needs for NHS routes, the DOT recommends that the Secretary be given authority to approve additions and deletions to the NHS as long as total NHS mileage does not exceed 165,000 miles (265,542 kilometers). The changes would be proposed to the Secretary by the States which must identify the modifications cooperatively with local officials through the statewide and metropolitan planning processes.

B. SYSTEM SUMMARY

The NHS as proposed consists of nearly 159,000 miles (nearly 256,000 kilometers) and is summarized below in terms of mileage, intermodal facility connections, and other characteristics.

Mileage and Travel

The NHS is made up of the Interstate System, the STRAHNET (about one-fourth of which is not on the Interstate System), and other highways. About 98 percent of the NHS is on facilities already serving traffic. New mileage is either on existing State plans and/or is in some stage of implementation, such as design, right-of-way acquisition, or construction. The distribution of the NHS by type, location, and ownership is described in the following table:

Characteristics	Mileage	Kilometers
By Type		
Interstate Highways	45,493	73,213
STRAHNET (Non-Interstate)*	15,500	25,000
STRAHNET Connectors*	2,000	3,200
Other NHS Routes*	96,000	154,500
By Location		
Urban*	40,000	64,400
Rural*	119,000	191,500
By Ownership		
Owned by States*	150,000	241,400
Owned by Others*	9,000	14,500

*Miles and kilometers are an approximation.

With respect to ownership, most NHS mileage not owned by the States is owned by local governments, Federal land management agencies, and toll authorities.

The NHS, as proposed, is estimated to serve 42 percent of rural travel and 40 percent of urban travel.

Intermodal Facility Connections

As discussed in previous sections, intermodal facilities are included on the national, State, and metropolitan maps to present the NHS in an intermodal context. The DOT has determined that these intermodal facilities warrant further consideration for connections to the NHS by the States in cooperation with the MPOs and other officials. Including these facilities on the maps illustrates how the NHS will

support an intermodal, integrated NTS. The facilities, identified by the FHWA in cooperation with other modal administrations, States, MPOs, other officials, and the private sector, are briefly described below.

- Ports — 104 ports are illustrated, including all major container ports. Each port handles greater than 750,000 short tons of cargo per year, handles over 350,000 short tons of foreign trade, or meets national defense requirements. Ports that are primarily dependent on rail and/or pipeline for the movement of cargo to and from the port area are not identified. The 104 ports shown on the maps handle about 72 percent of total U.S. waterborne cargo tonnage.
- Airports — 143 airports are illustrated. Each airport handles more than 250,000 annual enplanements. In total, these airports handle about 96 percent of total annual domestic enplanements as well as a similarly large amount of civilian airborne cargo.
- Amtrak Stations — 321 Amtrak stations are illustrated. Each station handled a combined total of over 20,000 entrainments and detrainments over the most recent 3-year reporting period.
- Rail/Truck Facilities — 191 rail/truck facilities are illustrated. Each facility handles more than 5,000 annual origins and/or destinations of railroad cars and relies heavily on the rail/truck intermodal connection.
- Public Transit Systems — A symbol is illustrated on the map for each of the 319 public transit systems reporting to the Federal Transit Administration (FTA) under its Section 15 data collection system in FY 1992. Since the NHS connects to all urban areas with populations above 25,000, access is provided to public transit systems serving over 99 percent of all transit riders. The metropolitan area maps will contain information on public transit fixed guideway routes (light, rapid, and commuter rail routes and busways).

It is important to note that these intermodal facilities are illustrative. Also, the connections to intermodal facilities have not been completely identified by the States and included in the system, for reasons explained in Section IV.C., "Development of the Final NHS Proposal." The mileage that has been identified by the States as connectors is a part of the proposed NHS. However, additional work is required to complete the identification of these connectors.

Because of the importance of the intermodal, statewide planning, and metropolitan planning elements of the NHS, the FHWA recommends that States, in cooperation with the MPOs and other local officials, be required to finalize identification of major intermodal facilities and appropriate connections within 2 years of the date of enactment of the NHS. The routes and facilities will be based on criteria to be established by the DOT. Identification of these facilities and connections within 2 years will allow consistent, careful, and comprehensive consideration of the intermodal element of the NHS as part of the statewide and metropolitan planning processes. After this 2-year period, a State may propose to the Secretary modifications to these connections in response to new needs, e.g., a new airport. Any approved routes would be added to the mileage of the NHS and would be eligible for NHS funds. Proposed legislative language to accomplish this is provided in Section VIII., "Legislative Language to Enact the NHS," of the report.

Other Characteristics

The FHWA estimates that the NHS contains the following number of bridges, railroad crossings, major border crossings with Canada and Mexico, and full access control mileage.

CHARACTERISTICS	NUMBER	MILEAGE/ *KILOMETERS*
Bridges*	55,000	
Railroad Crossings*	4,500	
Border Crossings		
Canada	32	
Mexico	21	
Full Access Control		
Interstate**		44,376 *71,416*
Other		7,876 *12,675*

* The number of bridges is an estimate based on State-by-State computations assuming the ratio of bridges per mile of NHS is similar to the ratio of bridges per mile of principal arterial. Likewise, the number of railroad crossings is an estimate based on the analogous assumption.

** The Interstate mileage does not include some mileage not subject to full access control, notably designated Interstate mileage in Alaska.

C. SYSTEM ATTRIBUTES

Design Standards

Section 1016(c) of ISTEA prescribes that the standards for the NHS be those approved by the Secretary in cooperation with the State highway departments working through AASHTO. Federal-aid capital improvement work on the NHS routes will be expected to meet standards appropriate for their functional classification, taking into account the type of traffic using the route. In other words, the NHS will not be built to a single minimum uniform design (i.e., four-lane, full access control) standard as was the Interstate System. A range of standards applicable to Federal-aid projects on principal arterials and the Interstate exist, and as changes to those standards are needed, they will again be adopted through the normal rulemaking process which involves public participation.

Design standards will be applied flexibly, based on the circumstances of particular projects. Design exceptions may be considered for specific reasons, including historic preservation, scenic and other environmental considerations, impacts on Federal lands, and inadequate physical space for full standards, based on an evaluation of the safety, operational performance, and cost implications of such exceptions.

Because accidents are a substantial cost of the operation of roads, special consideration will be given to safety in applying design standards for the NHS. The Interstate System provides some of the safest roads in the country, and this level of safety will be the goal of the NHS. Furthermore, special consideration will be given to improved safety at known hazard points of the system.

Existing and Advanced Technology

The DOT believes that since the NHS will be the premier system of roads in the Nation, it should promote the use of IVHS and other existing and advanced technologies. For example, new technologies, such as remote sensing and control and electronic vehicle identification being developed in IVHS work and from defense research conversion applications, should be incorporated where feasible. Available technology should be incorporated and planning should provide for using future advances as they become available. The DOT will actively promote and support the increased utilization of IVHS and other existing and advanced technologies on the NHS.

Planning and Environmental Analysis

Designation is only the first step in development of NHS projects. Projects advanced on designated NHS routes will be subject to the statewide and metropolitan planning processes required by ISTEA as well as the conformity requirements of the Clean Air Act Amendments of 1990. Under ISTEA and the National Environmental Protection Act other environmental factors must be integrated within the transportation planning processes. This includes coordination of the development of State Implementation Plans (SIPs) with development of transportation plans, programs, and management systems. Significant opportunities for meaningful public involvement must be provided throughout planning and project development. The planning processes will also allow State and local officials to consider using the flexibility inherent in ISTEA funding to transfer NHS funds to the Surface Transportation Program (STP) for use on nonroad projects.

Operation and Performance

At the time of the conception of the NHS, a goal of overall system efficiency was established. To meet this goal, the NHS will have to achieve operational levels consistent with changing travel needs and technology. Therefore, upon designation, the DOT will continue consultations with owners, operators, and users of facilities on the NHS and with other interested groups to develop or refine existing policies, standards, goals, and guidelines as appropriate relating to the performance, operation, maintenance, and special identification of the NHS routes.

Such policies will ensure that the NHS achieves maximum efficiency and safety in moving people and goods with intermodal connectivity. These policies will be based on historic experience and on information contained in the management systems (safety, pavement, bridge, congestion, public transportation facilities, and intermodal facilities) required by Section 1034 of ISTEA, as well as information on quality of life issues and on responsiveness to environmental needs. Such policies are also consistent with actions required to support the development of an NTS.

Long-term operation and maintenance must be given high priority by the owners of facilities on the NHS. So that maintenance problems are not built into the system, maintenance considerations (based on existing technology and future technology that can reasonably be anticipated), should be a part of the design process. Owners of the NHS facilities are expected to provide resources for maintenance and operation of the physical facilities and are expected to properly maintain Federal-aid projects on the NHS. This maintenance and operation responsibility is consistent with current roles and responsibilities under the Federal-aid highway program.

VIII. LEGISLATIVE LANGUAGE TO ENACT THE NHS

The following legislative amendments to Title 23, U.S.C., are proposed to implement the NHS designation:

A BILL

To amend Title 23, United States Code to provide for designation of the National Highway System, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Highway System Designation Act of 1994."

SECTION 2. NATIONAL HIGHWAY SYSTEM DESIGNATION

Section 103 of Title 23, United States Code, is amended by inserting a new subsection (c) to read as follows:

"(c) Designation

"(1) Submission.— The National Highway System as submitted by the Secretary of Transportation is hereby designated within the United States, including the District of Columbia and the Commonwealth of Puerto Rico.

"(2) Intermodal Connections.— Within 2 years after the enactment of this Act, the States shall, in cooperation with local officials, complete identification of appropriate connections from the National Highway System to major ports, airports, international border crossings, public transportation and transit facilities, interstate bus terminals, rail, and other intermodal facilities in accordance with criteria established by the Secretary for such connections and facilities. Such connections and facilities shall be identified through the metropolitan and statewide transportation planning processes carried out in accordance with sections 134 and 135 of this title. Upon approval by the Secretary, such connections shall be designated as being on the National Highway System.

"(3) Modifications.— At the request of a State, the Secretary may add new National Highway System segments, including intermodal connections, and delete existing route segments and connections provided that the total National Highway System miles do not exceed 165,000 miles (265,542 kilometers). The States shall establish that the requested route changes have been identified cooperatively with local officials through the metropolitan and statewide transportation planning processes carried out in accordance with sections 134 and 135 of this title. The Secretary shall determine that the requested changes meet criteria established for the National Highway System and shall determine that the requested changes enhance the national transportation characteristics of the National Highway System."

SECTION-BY-SECTION ANALYSIS

This Act designates the National Highway System (NHS) of the United States; provides that within 2 years of enactment, the States shall complete identification of appropriate intermodal connections to the NHS to enhance the intermodal connectivity of the NHS; and authorizes the Secretary to modify the NHS, provided that total miles do not exceed 165,000 miles (265,542 kilometers).

IX. RESPONSE TO REPORT OF SENATE APPROPRIATIONS COMMITTEE ACCOMPANYING 1994 DOT AND RELATED AGENCIES APPROPRIATIONS ACT

The Senate Appropriations Committee included in its report (Report 103-150, at page 132) accompanying the 1994 DOT and Related Agencies Appropriations Bill (H.R. 2750, enacted as P.L. 103-122), a request that FHWA identify:

> (1) the roads and the corresponding number of miles which are within nonattainment areas and which are not; (2) the roads and the corresponding number of miles intended for new capacity or expansion (the addition of one or more lanes), and the roads which will receive maintenance funds only; and (3) the nonroad projects which are eligible projects under the NHS criteria (sec. 1006(d) of ISTEA) and the corresponding number of miles.

The NHS recommendations provided to the FHWA in the spring of 1993 did not provide detailed data of the type needed to directly respond to the questions contained in this committee report. However, the following information related to the committee's concerns uses approximations to provide the best, reasonably available information.

With respect to nonattainment areas, the FHWA estimates that over 20,000 miles (over 32,000 kilometers) of the NHS are in nonattainment areas. This estimate includes:

a. Those ozone nonattainment areas that are classified transitional or incomplete, and

b. Carbon monoxide, small particulate, oxides of nitrogen, or sulfur dioxide nonattainment areas.

This is a gross estimate based on mileage in urbanized areas that are in nonattainment, not on exact nonattainment boundaries.

With respect to mileage intended for lane additions, the DOT estimates that about 2,500 to 3,000 miles (about 4,000 to 4,800 kilometers) of the NHS represent new facilities, exclusive of the Transamerica Corridor (also known as Route 66) and the Indianapolis-to-Houston Corridor. These corridors are noted in the ISTEA Section 1105(c), as amended. Major feasibility studies under way on these corridors will help to determine the extent of new facilities in these cases. In addition, decisions on whether facilities should be widened are not made by the DOT, but by State, the MPO, and other officials. The DOT does believe, based on discussions with State and local officials, that much of the NHS is now and will be, for the indefinite future, two-lane roads. Mileage representing new facilities is either on existing plans or is in some stage of implementation (e.g., design, right-of-way acquisition, and construction).

With respect to nonroad (e.g., public transit) projects, the DOT estimates that about 19,000 miles (about 30,600 kilometers) of the NHS, including Interstate routes, are fully access controlled facilities located in urbanized areas. Nonroad projects or non-NHS road projects in proximity to and improving the level of service on these facilities would be the most likely candidates for this use of NHS funds. In addition, NHS funds may be transferred to the STP and used for nonroad projects. All such projects, however, qualify for Federal-aid participation on an individual basis. Decisions regarding project selection are not made by the DOT, but by State, MPO, and other officials.

X. NOTES ON SOURCES FOR THIS REPORT

Information on the highway legislation from 1921 until World War II came from:

- The report entitled *Toll Roads and Free Roads*, which is noted in the text. This report was requested by and transmitted to Congress by President Roosevelt in 1939.
- A 1941 report from the National Interregional Highway Committee, which was appointed by President Roosevelt, regarding a "limited system of national highways."
- 1944 reports entitled *The Role of the Federal Government in Highway Development* and *A Sound Plan for Post-War Roads and Jobs.*
- A 1954 report on the minutes of "Public Hearings Pertaining to a National Highway Program." General Lucius D. Clay was chairman of the committee conducting the hearings.
- A circular memorandum written in 1955 from the Deputy Commissioner of the BPR. This memorandum contained material submitted to the United States Senate earlier that year.

Information on the legislation of the Eisenhower era came from portions of the 1955 circular memorandum noted immediately above and:

- A *Congressional Digest* of May 1955 which contained highlights of the debate over the President's highway program.
- A June 9, 1955, internal memorandum (subject: "Criteria for Selection of Additional Interstate System Routes in Urban Areas") of the Bureau of Public Roads.
- A 1958 report from the Secretary of Commerce (subject: "A Report of Factors for Use in Apportioning Funds for the National System of Interstate and Defense Highways") to the Speaker of the House of Representatives.

Information on the evolution of the NHS concept came from portions of:

- A 1988 AASHTO report entitled *Keeping America Moving: The Bottom Line.*
- A November 1988 FHWA report entitled *America's Challenge for Highway Transportation in the 21st Century; Interim Report of the Future National Highway Program Task Force.*
- A 1989 AASHTO report entitled *New Transportation Concepts for a New Century*. This publication enumerated criteria for a "Highway System of National Significance."
- A 1989 AASHTO report entitled *Moving America Into the Future*. This report was based on 65 forums attended by some 9,000 persons as well as a publication by the Transportation Alternatives Group (TAG). In addition to AASHTO, TAG consisted of the American Automobile Association, the American Public Transit Association, the American Public Works Association, the American Trucking Association, the Highway Users Federation, the National Association of Counties, NARC, the National Conference of State Legislatures, the National Governors Association, the National League of Cities, and the U.S. Conference of Mayors.
- A May 23, 1990, letter from the House of Representatives Committee on Public Works and Transportation to FHWA Administrator Thomas D. Larson. This letter requested an NHS map and advised consultation with MPOs and rural agencies in developing what became the illustrative NHS.
- The ISTEA (P.L. 102-240) as well as Report 102-171 of the Committee on Public Works and Transportation, U.S. House of Representatives, to accompany H.R. 2950 and Report 102-71 of the Committee on Environment and Public Works, United States Senate, to accompany S. 1204.

Information concerning transportation and the economy and the economic benefits of highways and transportation came from portions of:

- A 1993 ENO Transportation Foundation, Inc., report entitled *Transportation in America: 1993, 11th Edition.*
- A 1970 U.S. House of Representatives Public Works Committee Report, *Benefits of Interstate Highways* (September-1970).
- A 1983 FHWA paper entitled *Benefits of Interstate Highways*, which focused on user benefits.
- An FHWA Policy Discussion Paper (Series No. 4, August-1992) entitled *Assessing the Relationship Between Transportation Infrastructure and Productivity.*
- 1991 and 1993 U.S. Department of Transportation reports entitled *The Status of the Nation's Highways and Bridges: Conditions and Performance.*
- A 1992 FHWA report entitled *Highway Statistics 1991* and preceding reports of *Highway Statistics.*
- A 1992 Research and Special Programs Administration report entitled *National Transportation Statistics.*

- A 1992 U.S. General Accounting Office report entitled *US-Mexico Trade: Survey of US Border Infrastructure Needs*. This report is numbered GAO/NSIAD-92-56.
- A 1992 Highway Users Federation report entitled *Forging Transportation Strategy: A Framework for the 1990s.*
- A 1993 Transportation Research Board report entitled *Landside Access to U.S. Ports. Special Report 238.* This report contains the information about congestion to access routes serving the ports.
- A 1993 DOT interagency report entitled *Landside Access Port Visits: North and South Atlantic Regions.*
- A 1993 DOT interagency report entitled *Landside Access Port Visits: Great Lakes, Inland Waterways, and Gulf Regions.*
- A 1993 DOT interagency report entitled *Landside Access Port Visits: North and South Pacific Regions.*
- A 1993 (September Draft) FHWA report entitled *The National Highway System As a Means of Increasing Competitiveness: Thoughts of Business Leaders.* This report contains information from a focus group on the anticipated benefits to U.S. business of the NHS.

An overall summary of the benefits of the NHS is found in the 1993 DOT/FHWA brochure entitled *The National Highway System - The Backbone of America's Intermodal Transportation Network.*

Information on the routes needed for national defense came from the sources noted in the text of Section IV. C., "Development of the Final NHS Proposal."

Information on intermodal facilities included for illustration on the NHS maps came from:

- A series of FTA reports entitled *Transit Profiles: For the 1992 Section 15 Report Year.* These reports contain information on transit systems receiving Federal funds to support operations during that year.
- A 1993 Maritime Administration file on electronic medium. This file contains a listing of the ports shown on the maps.
- A 1993 Federal Aviation Administration file on electronic medium. This file contains a listing of the airports shown on the maps.
- Two 1993 Federal Railroad Administration files on electronic medium. These files contain a listing of the Amtrak stations and rail/truck facilities shown on the maps.

Information to respond to the Senate Appropriations Committee came out of discussions between FHWA employees familiar with various information sources and data bases relevant to the request (individual NHS State proposals, Highway Performance Monitoring System, *Highway Statistics* data base, geographic information, air quality, etc.).

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