

Working Through the Evolving Legacy of Metropolitan Transportation Planning

ALAN E. PISARSKI

Like many transportation professionals, I am a child of the 1962 Federal-Aid Highway Act. In that legislation, Congress mandated that all metropolitan areas with a population of more than 50,000 must have a planning process in place by 1965. This year marks the 50th anniversary of that extraordinary legislation, providing an opportunity to transmit a sense of that productive period to the current generation of planners.

In the scramble to comply with the mandate, the Bureau of Public Roads (BPR)—the predecessor to the Federal Highway Administration—laid out the course to be followed across the country. Pioneers within BPR established policies to implement the act, building on limited experience and available research results to define the scope and nature of the technical process for metropolitan transportation planning and to lay the foundation for the current process. Perhaps most notable is that virtually all of the technical guidance documents from that era bear the name of a BPR staffer as author; similar documents today would bear the name of a consulting firm.

The process was emphatically technical and quantitative

The author is a transportation consultant in Falls Church, Virginia. Author of the Commuting in America series, he is a longtime volunteer leader in Transportation Research Board committees and project panels and is a recipient of the W. N. Carey, Jr., Distinguished Service Award.



Photo: Florida State Archives

Construction of the 20th Street Expressway (now Martin Luther King Parkway) in 1962, in Jacksonville, Florida, east of what would become Interstate 95. Major highway projects already were under way in many metropolitan areas when Congress mandated the establishment of a planning process.

from the start—often half or more of new agency budgets supported data collection. Data collection dominated the early years, providing time for the modeling and other elements of the planning process to evolve. Instead of counting traffic on roads, the concepts of true origins and destinations and of travel demand as a socioeconomic phenomenon were born.

How might metropolitan transportation planning have evolved without the federal mandate and guidance? The federal process established the basic requirements. Many areas innovated and designed techniques and approaches that were more sophisticated, but many others might have lagged behind. Although tending toward a common approach, federal guidance and funding provided early training and a set of fundamentals, building competency and establishing the foundations that permitted many areas to develop innovative new tools.

The accompanying feature article and sidebars provide an in-depth look at the 50-year period and at the role of transportation planning, tracing the origins and early years of the act, its evolution, and its ramifications for the profession and for our society. Additional thoughts from other witnesses to that period are posted on the TRB History Committee website; readers are invited to add comments and observations: <http://sites.google.com/site/trbcommitteeabg50>.

Metropolitan Transportation Planning

An Abbreviated History of the First 50 Years

KEVIN E. HEANUE AND EDWARD WEINER

Heanue began his 40-year federal career at the Bureau of Public Roads in 1958 and was assigned to the newly established Urban Planning Division in 1962; he retired as Director of Environment and Planning and now works as a consultant in Alexandria, Virginia. Weiner, a consultant in Silver Spring, Maryland, is the author of *Urban Transportation Planning in the United States: History, Policy, and Process*; the fourth edition is forthcoming from Springer Science + Business Media, LLC, New York.

In April 1962, President John F. Kennedy delivered his first message to the U.S. Congress on the subject of transportation. The message emphasized coordination and cooperation and set the stage for enactment of the 1962 Federal-Aid Highway Act with its Section 134 planning provisions and of the 1964 Urban Mass Transportation Act that began federal assistance for transit.

Without significant debate, Congress passed the highway legislation, requiring the establishment of a continuing, cooperative, and comprehensive (3C) planning process in every urbanized area with a population of more than 50,000. Normally planning is the first step in the development of infrastructure proposals. In this case, a planning process was enacted after construction of the Interstate Highway System had begun and as controversy over the system was reaching fever pitch in urban areas.

Origins of the Act

The origins of the metropolitan transportation planning requirements in the Federal-Aid Highway Act of 1962 can be traced to the Federal-Aid Highway Program that began when Congress established the Office of Road Inquiry in 1896 and appropriated financial aid to the states for highway construction in 1916. Also influential was the emergence of city planning as a profession, signaled by a national meeting on city planning in Washington, D.C., in 1909.

The Interstate Highway System traces back to a 1939 report to Congress, *Toll Roads and Free Roads*. A 1944 Congressional report, *Interregional Highways*, further elaborated the system concepts.

In the Federal-Aid Highway Act of 1944, Congress called for a national system of Interstate highways limited to 40,000 miles. The general locations of 37,700 of those miles were announced in 1947; of



PHOTO: GEO. STOUTON/WHITE HOUSE PHOTOGRAPHS; JOHN F. KENNEDY PRESIDENTIAL LIBRARY AND MUSEUM

President John F. Kennedy delivers the 1962 State of the Union address. That spring, he would speak to Congress about the importance of cooperating to enact broad transportation legislation and, in June, would sign the 1962 Federal-Aid Highway Act into law.

those, 2,900 miles were in urban areas. The remaining 2,300 miles within the limit were reserved for urban circumferential and distributing routes.

Between 1947 and 1955, many groups—most notably the Clay Committee appointed by President Eisenhower—addressed the problem of finalizing and enacting the proposed Interstate highway program. The process included many consultations between federal, state, and local officials.

Interstate Vision

In 1955, informed by the Clay Committee, the Eisenhower Administration advanced a proposal for the enactment of an Interstate Highway System. The proposal failed in the U.S. Congress. The administration continued to work with Congress to develop a new proposal overcoming the perceived deficiencies.

A report—known as the Yellow Book—was circulated to members of Congress in September 1955. The report contained a one-page map of the proposed national Interstate system—essentially the 1947 rural highway map—and series of maps of major metropolitan areas with sketch plans of specific Interstate Highway Systems.

The Yellow Book showed the general, schematic location of the original 2,900 urban miles identified in 1947, along with the schematic locations for the 2,300 urban miles that had been reserved but not identified. The Department of Defense argued for beltways around the most congested urban areas; these could connect inland military posts and ammunition depots with ports and would supplement the designated routes through cities.

The 1956 act established the Highway Trust Fund with pay-as-you-go provisions; funding for the system was to be 90 percent federal and 10 percent from the states. All routes were to be limited access.

The development of the Interstate Highway System program involved federal analyses of potential total mileage and candidate routes. The routes were brokered in a series of consultations between the Bureau of Public Roads (BPR) and the states about the rural segments of the proposed system, until a degree of consensus was achieved. Consultations between federal and state officials and representatives of metropolitan areas continued.

Urban Outcry

The 2,900 urban miles identified in 1947 were not adequate; many urban areas lobbied for more mileage. In December 1954, the annual congress of the American Municipal Association (AMA) endorsed with a 90 percent plurality a resolution for additional urban Interstates. The following year, after Congress had failed to act, AMA unanimously passed



PHOTO: LIBRARY OF CONGRESS PRINTS AND PHOTOGRAPHS DIVISION

a similar, more strongly worded resolution.

The formal publication of the Yellow Book in September 1955 identified the remaining urban miles. As Frank Turner observed, “then of course the thing hit the fire.”

Many loose ends remained when the Interstate program was enacted in 1956. In many cities, the proposed Interstate alignments were well understood and had been incorporated into city plans. In others, however, the alignments had not been defined; as a result, alternative studies showed a potential impact on more neighborhoods than would occur when the final alignment was determined. “Freeway revolts” arose in several cities, as citizens and local officials realized that houses would be taken and neighborhoods disrupted.

In 1957, the Hartford Conference brought together federal, state, and city officials and associa-

Road grading in 1916, the year that Congress appropriated financial aid to assist states in highway construction.

The Yellow Book, which contained sketches of Interstate Highway Systems in major metropolitan areas such as St. Louis, Missouri, was an attempt to reach consensus on federal and local highway plans.

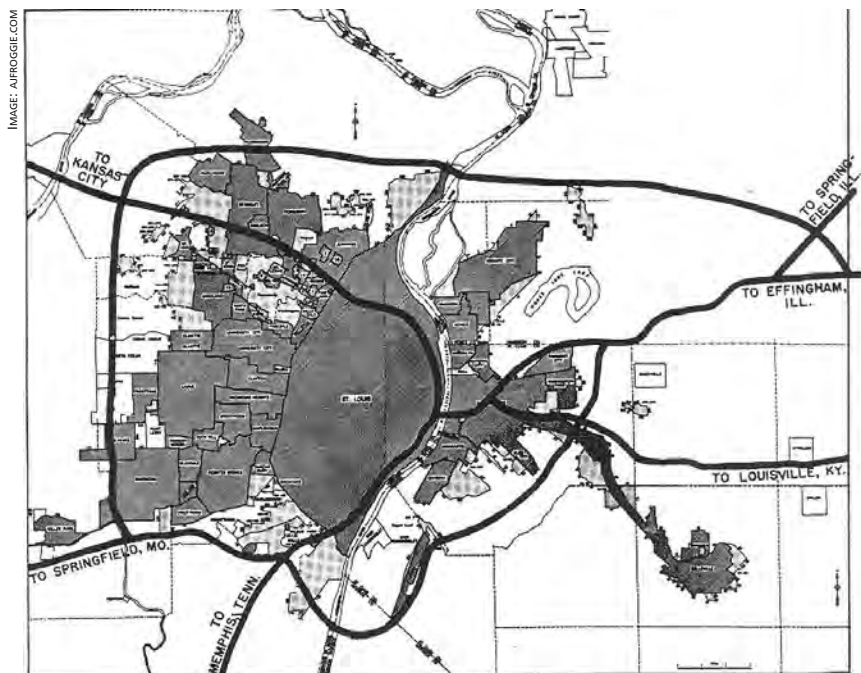


IMAGE: AFROGIE.COM

tions that had worked together to forge the concepts that became the Interstate program. Also participating were representatives from urban planning and other urban interests who were opposed to the Interstate concept.

Ted Holmes, a leading BPR planner, stated that the “conference did little to promote cooperative development between highway people and others. Actually, it promoted adversarial relationships.”

Those who had been influential in developing the system debated what went wrong and what could be done. Additional national conferences convened: first at the Sagamore Conference Center at Syracuse University in New York in 1958; next in Hershey, Pennsylvania, in 1962; and finally in Williamsburg, Virginia, in 1965.

Shaping Section 134

In the meanwhile, the Kennedy administration had initiated a series of reviews of federal programs. The Interstate construction program, the urban renewal program, the land use planning program of the Housing and Home Finance Agency, and the highway planning program were among those placed under scrutiny.

In an oral history interview, Holmes described a seminal event in the development of the legislative provision in Section 134 of the 1962 act. Two senior officials of the Bureau of the Budget, Paul Sitton and Gordon Murray, came to his office in 1960 with a proposal. They noted that highway planners employed quantitative analyses to yield traffic volumes and that land use planners employed a quali-

The Federal-Aid Highway Act of 1962

Legislation with a Lasting Impact

JOHN FISCHER

The Federal-Aid Highway Act of 1962 included a few new provisions, most notably the provisions for planning. In contrast to the drawn-out debates that have characterized reauthorizations of surface transportation programs in recent decades, the 1962 legislation took a simple path to passage—almost a textbook civics lesson in how governmental processes should work. The President proposed and Congress disposed; strong Executive Branch and Congressional leadership applied throughout the process. The Kennedy Administration made its views on transportation policy known in April 1962, and less than seven months later, the new act came to fruition—notably, with little controversy.

President Kennedy’s “Message on Transportation,” a 16-page document covering a range of issues, called for the creation of a planning process that closely resembled the description in the final legislation.^a The Department of Commerce and its operating agency, the Bureau of Public Roads (BPR), took the lead in promoting the Administration’s positions. BPR presented Congress with a strong policy recommendation, which was incorporated into Congressional positions in the following months. Congress began consideration of the highway bill with hearings by the House Committee on Public Works in late April and early May. By the end of June, the Committee had filed its report, and the House passed its bill soon after.

The Senate took up its own bill in early August with hear-



PHOTO: ABBIE ROWE/WHITE HOUSE PHOTOGRAPHS; JOHN F. KENNEDY PRESIDENTIAL LIBRARY AND MUSEUM

ings by the Senate Committee on Public Works. The Senate Committee filed its report in early September, and the Senate subsequently passed the legislation. A conference committee convened and on October 10 filed a report that was two pages long, with a two-page statement by the House Managers attached. The planning provisions in the House and Senate bills were largely identical and were not a subject of discussion during the conference.

President Kennedy signed the act on October 23, 1962.^b The legislation was regarded as a notable achievement at the time and has had a wide-ranging and positive impact on U.S. transportation policy to this day.

The legislation was regarded as a notable achievement at the time and has had a wide-ranging and positive impact on U.S. transportation policy to this day.

The author was a specialist in transportation policy at the Congressional Research Service, Washington, D.C., for more than three decades and now works as a consultant in Annapolis, Maryland.

^a Office of the White House Press Secretary. Message on Transportation: To the Congress of the United States. The White House, April 4, 1962.

^b Public Law 87-866.

tative approach that yielded colored maps. They wanted to bring the two approaches together, and asked BPR to fund land use planning.

Holmes agreed to cooperate. On a later visit to BPR, Sitton showed Holmes a draft of what was to become the Section 134 language.

Those who wrote the words of Section 134 and those who implemented it drew on the work of leading researchers and practitioners—notably from the broadly based National Committee on Urban Transportation—and mandated the establishment of a data-based, multimodal, analytically oriented process, responsible to state and local officials. Although the process was not in place for planning and designating the urban Interstates, the institutions now known as metropolitan planning organizations (MPOs) have proved their worth, and almost every highway and transit reauthorization that followed has further defined and expanded the roles of MPOs.

Implementing the 1962 Act

BPR, then part of the U.S. Department of Commerce, moved quickly to implement the urban transportation planning requirements of the Federal-Aid Highway Act of 1962. BPR's Urban Planning Division carried out a program to interpret the provisions of the act, develop planning procedures and computer programs, write procedural manuals and guides, provide technical assistance, conduct training courses, and develop professional staff. The goal was to assist planning organizations in urbanized areas by standardizing, computerizing, and applying procedures largely created in the late 1950s and by disseminating knowledge of these procedures.

Interpreting the Provisions

An instructional memorandum, published in March 1963,¹ interpreted the act's provisions for a 3C planning process:

◆ *Cooperative* included not only cooperation between the federal, state, and local governments but also among agencies within the same level of government.

◆ *Continuing* referred to the need to reevaluate and update a transportation plan periodically.

◆ *Comprehensive* included the 10 basic elements of a 3C planning process that required inventories and analyses (see box, this page).

These memoranda and later refinements and expansions covered all aspects for organizing and carrying out the 3C planning process.

¹ Instructional Memorandum 50-2-63, later superseded by Policy and Procedure Memorandum 50-9.

Ten Basic Elements of the Continuing, Comprehensive, and Cooperative Planning Process

1. Economic factors affecting development.
2. Population.
3. Land use.
4. Transportation facilities, including those for mass transportation.
5. Travel patterns.
6. Terminal and transfer facilities.
7. Traffic control features.
8. Zoning ordinances, subdivision regulations, and building codes.
9. Financial resources.
10. Social and community value factors, such as preservation of open space, provision for parks and recreational facilities, preservation of historic sites and buildings, and consideration of environmental amenities and of aesthetics.

Funding

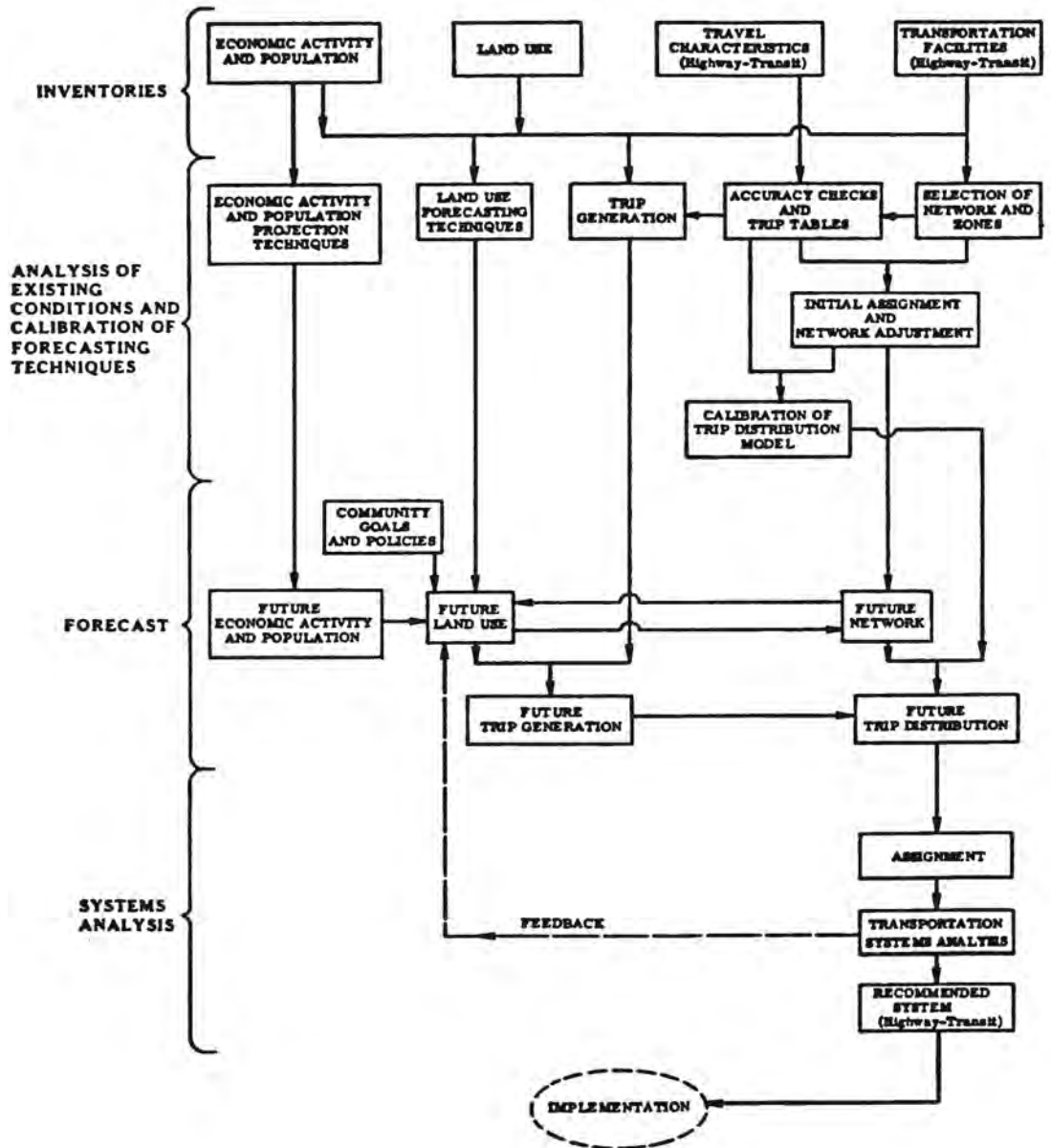
The 1962 act also required that 1.5 percent of the funds apportioned to a state for highway construction be spent on highway planning and research (HP&R). An additional .5 percent of highway construction funds could be spent at the option of the state. The state, however, had to match these funds, supplying 50 percent of the project costs. The HP&R funds, combined with a state's matching funds, supported the urban transportation planning process.

Planning Procedures

BPR defined the steps in a 3C planning process. Pioneered by urban transportation planning studies of the 1940s and 1950s, the empirical approach required a substantial amount of data and several years to complete. The process involved establishing an organization to carry out the planning process; development of local goals and objectives; surveys and inventories of conditions and facilities; analyses of conditions and calibration of forecasting techniques; considering both highway and transit modes; forecasting of future activity and travel; evaluation of alternative transportation networks to produce a recommended transportation plan; staging of the transportation plan; and identification of resources for implementing the plan. The 3C planning studies generally produced an elaborate report tracing the procedures, analyses, alternatives, and the recommended plans.

The 3C planning process included four technical phases: collection of data, analysis of data, forecasts of activity and travel, and evaluation of alternatives. The urban travel forecasting process was central to this approach (see Figure 1, next page), using mathematical models to simulate and forecast travel. This permitted the testing and evaluation of alternative transportation networks.

FIGURE 1 Urban travel forecasting process.



The four-step urban travel forecasting process consisted of trip generation, trip distribution, modal split, and traffic assignment. These models first were calibrated to replicate current travel from survey data. These models then were used to forecast travel, starting with an estimate of the variables that determine travel patterns, including the location and intensity of land use, social and economic characteristics of the population, and the type and extent of transportation facilities in the area. The variables in turn were used to estimate the number of trip origins and destinations in each subarea of a region—that is, the traffic analysis zone—with a trip generation procedure.

A trip distribution model connected the trip ends in an origin–destination trip pattern. A modal split

model divided the matrix of total vehicle trips into highway and transit trips. A traffic assignment model then assigned the matrices of highway and transit trips to routes on the highway and transit networks, respectively.

To analyze future transportation networks with these models, forecasted variables were input for the test year. Travel forecasts were then prepared for each alternative to determine traffic volumes and levels of service. Usually only the modal split and traffic assignment models were rerun for additional networks after completion of a future year forecast for the first network. Occasionally the trip distribution model also was rerun.

This approach to urban travel forecasting quickly entered widespread use. The procedures were tailored

specifically to the tasks of regionwide urban transportation planning, and BPR provided substantial assistance and oversight. No other procedures were generally available; urban transportation study groups that opted for other approaches had to develop their own procedures and computer programs.

Computer Software

Travel forecasting on a regionwide scale required a large computing capability. The first generation of computers became available in the mid-1950s. BPR took advantage and adapted the Moore algorithm for telephone routing to operate for traffic assignment on the IBM 704 computer. Additional programs were developed for other functions.

The second generation of computers, circa 1962, provided increased capabilities. The library of computer programs was rewritten for the IBM 709 computer and then for the IBM 7090/94 system. BPR worked with the Bureau of Standards to develop, modify, and test these programs. Some programs were developed for the IBM 1401 and 1620 computers. This effort continued for several years, so that by 1967 the computer package contained approximately 60 programs.

To foster the adoption of these technical procedures, BPR released procedural manuals that became the technical standards for many years to come (see box, this page).

Technical Assistance

Professional staff at BPR provided hands-on technical assistance to state and local agencies for applying these new procedures to their areas. BPR staff traveled to states and urbanized areas to assist in installing computer software and in running the forecasting models. In addition, BPR staff were available by telephone for assistance and technical guidance.

As part of these efforts, BPR developed the *Highway Planning Program Manual* to consolidate and make readily available the technical information on planning practice. First issued in August 1963, the manual primarily addressed the highway engineers in BPR's field offices who administered the highway planning activities of state highway departments and of urban transportation planning groups receiving federal-aid highway planning funds. The manual also provided valuable information for planners in state and local agencies.

The section of the manual devoted to urban transportation planning covered a variety of planning activities and procedures, including organization, use of computers, origin–destination studies, population studies, economic studies, land use, street inventory and classification, evaluation of traffic ser-



PHOTO: LAWRENCE LIVERMORE NATIONAL LABORATORY

In the mid-1950s, IBM 704 and other first-generation computers were put to work by the Bureau of Public Roads for travel forecasting functions.

vices, traffic engineering studies, public transportation, terminal facilities, travel forecasting, traffic assignment, developing the transportation plan, plan implementation, and the continuing planning process.

Training and Staff Development

BPR developed a two-week urban transportation planning course for planners and engineers. The course covered organizational issues and technical procedures for the 3C planning process. The BPR manuals served as textbooks, supplemented with lecture notes to keep the information current and to cover additional mate-

Select Foundational Manuals from the Bureau of Public Roads

- ◆ *Calibrating and Testing a Gravity Model for Any Size Urban Area* (July 1963);
- ◆ *Calibrating and Testing a Gravity Model with a Small Computer* (October 1963);
- ◆ *Traffic Assignment Manual* (June 1964);
- ◆ *Population Forecasting Methods* (June 1964);
- ◆ *Population, Economic, and Land Use Studies in Urban Transportation Planning* (July 1964);
- ◆ *The Standard Land Use Coding Manual* (January 1965);
- ◆ *The Role of Economic Studies in Urban Transportation Planning* (August 1965);
- ◆ *Traffic Assignment and Distribution for Small Urban Areas* (September 1965);
- ◆ *Modal Split: Documentation of Nine Methods for Estimating Transit Usage* (December 1966); and
- ◆ *Guidelines for Trip Generation Analysis* (June 1967).

rial. The staff members who had developed the technical procedures, written the manuals, and provided technical assistance taught the course, which was widely attended by state and local government staff, consultants, university faculty and graduate students, and staff from many foreign governments.

Recognizing a need for professional staff trained to implement the 1962 act, BPR developed an 18-month urban transportation training program for new employees with master's degrees. The trainees worked on a rotating basis in regional and division offices, in the Urban Planning Division Office in Washington, D.C., and in ongoing urban transportation studies around the country. Also required was the two-week

urban transportation planning course.

After completing the program, trainees received assignments at the Urban Planning Division. In addition, BPR sent five field staff for two years of study and training at Yale University, where they earned certificates from the Yale Bureau of Highway Traffic and master's degrees in urban transportation planning.

State and Local Roles

The implementing rules of the 1962 act required states and local governments to sign a memorandum of agreement to carry out the 3C planning process in their regions. A Unified Annual Work Program set out the various steps and the organization responsi-

J. Douglas Carroll, Jr.

Pioneer of Urban Transportation Planning

ALAN E. PISARSKI

As a college student, I worked for J. Douglas Carroll, Jr., at the Tri-State Transportation Commission, which then covered the New York metropolitan megaregion comprising one-tenth of the nation's population, including 26 counties in New York, New Jersey, and Connecticut. With the implementation of the Federal-Aid Highway Act of 1962, the area became a test for the validity of the concept of metropolitan planning. The Bureau of Public Roads (BPR) recruited that era's stars of the profession and sent a cadre of BPR staff on loan to assure success. Many others from all over the United States took cuts in pay to work for Carroll—the cuts were called tuition.

Carroll was the first doctoral graduate of Harvard University's then-new planning school; the renowned modernist architect Walter Gropius was his adviser. The Tri-State Transportation Commission recruited Carroll from the Chicago

Area Transportation Study (CATS), which he had directed since 1955. At CATS he established the basic technical and practical framework for all transportation studies. Carroll extended the lessons he had learned as director of the Detroit Transportation Study from 1952 to 1954 and from an earlier study he had managed in Flint, Michigan. State and local authorities adopted the regional plans Carroll had developed in Detroit and Chicago.

In Detroit, Carroll established the basic six-step process, still recognizable today:

- ◆ Data collection.
- ◆ Forecasts.
- ◆ Goal formulation.
- ◆ Preparation of network proposals.
- ◆ Testing of proposals.
- ◆ Evaluation of proposals.

The Tri-State program's massive data collection effort included aerial photography of the entire 8,000-square-mile region, x-y coordinate delineation of all land parcels on 180,000 blocks, and a face-to-face home interview survey of 65,000 households. The results were "to confirm Doug Carroll's intuitions," according to Tri-State Technical Director Lee Mertz, who later became the Federal Highway Administration's first Associate Administrator for Policy.

For more information about Carroll's work and legacy, see the profile in *Pioneers of Transportation*, which includes biographies of other founders of the transportation planning profession.*

* See the Institute of Transportation Engineers online bookstore, www.ite.org/emodules/scriptcontent/Orders/ProductDetail.cfm?pc=LP-673-E.



Photo: Chicago Transit Authority

Riders exit a Loop-bound Ravenswood B train in Chicago in the 1960s. Led by J. Douglas Carroll, Jr., the pioneering Chicago Area Transportation Study examined Chicago Transit Authority networks and other metropolitan transportation issues.

ble for each step.

States and local governments had to make major efforts to organize and develop their own planning process—few areas had an urban transportation planning process in place in 1962. Negotiating the memorandum of agreement, hiring staff, developing work programs, and beginning the technical tasks to develop an urban transportation plan took time. Nevertheless, all of the 224 urbanized areas that fell under the 1962 act had an urban transportation planning process under way by the legislated deadline of July 1, 1965.

BPR's efforts defined the 3C planning process, developed techniques for performing the technical activities, and provided technical assistance that transformed urban transportation planning. The mandatory involvement of local officials and the inclusion of transit—along with the 10 basic elements of the 3C planning process—caused urban transportation planning to spread quickly throughout the United States and to influence urban transportation planning in other parts of the world.

Process at Work

The process and techniques of urban transportation planning have evolved in response to changing issues, conditions, and values; to more advanced planning methodologies; and to an improved understanding of urban transportation phenomena. Urban transportation planning practice today is more sophisticated, complex, and costly than when first practiced in the 1960s and involves a much wider range of participants with a broader range of academic backgrounds.

Although several urban transportation studies had been completed before 1962, in most areas the planning for urban Interstates was based on informal coordination between state and local officials. This cooperative designation process identified routes as candidates for the system in a schematic way.

Beginning in 1962, many forms of urban transportation studies emerged. In every instance, policy and technical committees of state and local officials directed the process.

In the largest urban areas, resident staff conducted surveys, performed required analyses, and developed plans. In many areas, consulting firms undertook the required surveys, analyses, and draft plans under contract. Firms such as Wilbur Smith and Associates, Alan M. Voorhees and Associates, and Barton Aschman Associates, Inc., played major roles in advancing urban transportation planning.

In other areas, notably New York and Texas, states took responsibility for computer-based model analysis on behalf of the planning organizations. Many



ARCHIVE PHOTO

The Washington, D.C., Metro system had lasting impact on the region's development. BPR's 3C planning process transformed urban planning by involving transit and local officials.

planning organizations relied on consulting firms to perform computer-based technical analyses but performed all other functions in-house.

Benchmark Events

Major benchmarks in this evolution include the following:

- ◆ The establishment in 1962 of federal aid for transit through the Department of Housing and Urban Development.

- ◆ The availability of federal funding, beginning in the mid-1960s, for the development of land use inputs to the transportation planning process, through a program of the Housing and Home Finance Agency.²

- ◆ The Department of Transportation Act of 1966, which established the new agency and transferred the Urban Transit Administration to it in 1968.

- ◆ BPR's 1968 definition of "continuing," which clarified that the planning process was not a one-time effort but had a mandatory, continuing role in federal highway assistance to states and metropolitan areas.

- ◆ The establishment by Congress in 1968 of formula-based funding entitlements for planning for each MPO, in response to concerns that a state objecting to a planning organization's actions could cut off funds.

- ◆ The National Environmental Policy Act of 1969, which required federal agencies to use a "systematic, interdisciplinary" approach on projects affecting the environment. The process culminated with the preparation of an Environmental Impact Statement.

- ◆ The Clean Air Act Amendments of 1977, which required transportation plans and programs to conform to established clean air standards. The Clean Air Act created huge policy and analytical burdens for MPOs in nonattainment areas—that is, areas that did not meet the standards.

² Under the Urban Planning Assistance Program authorized in Section 701 of the Housing Act of 1954, as amended in 1965.

◆ The Highway Act of 1973, which provided flexibility between highway and transit funds and assigned a major decision-making role to MPOs in the substitution, transfer, and use of urban Interstate system funds for transit. In addition, the governors of each state were asked to designate an MPO for each urbanized area with a population of more than 50,000 as defined by the Census Bureau.

◆ The regulatory consolidation of planning requirements by BPR and the Urban Mass Transportation Administration, implementing the 1973 Highway Act, which merged policy-setting, technical assistance, and training efforts.

◆ The Intermodal Surface Transportation Efficiency Act of 1989, which defined the post-Interstate highway and transit programs and expanded the role of MPOs.

Role of Analysis

This overview of 50 years of U.S. urban transportation planning reveals a crosscutting analytical theme. Until the early 1960s, transportation plans were derived from results of large-sample, home-interview surveys, expanded by growth factors to project a future year. The potential usage of the proposed beltways and new river crossings of the Interstate Highway System, however, did not relate to historic travel patterns.

At the same time, the rapid evolution of main-frame computers enabled such pioneers as Alan M. Voorhees, Mort Schneider, and Anthony R. Tomazinis to develop competing simulation models to estimate future travel patterns based on land use and the

characteristics of the proposed transportation systems. Following closely, transit planners developed mode choice models to estimate the ridership on transit and the volume of highway traffic in a single, integrated modeling framework. Air quality analysts also built on this work.

Nevertheless, from the mid-1940s and throughout this period, transportation planners had grounded their work on existing and proposed land use. Fortunately, the Bureau of Budget officials Sitton and Murray were aware of the analytical progress in the transportation planning

process and framed the language of the 1962 act around analysis.

In the 50-year evolution of the planning process, the Transportation Research Board has served as a partner, continually adapting its committee structure and session programs to provide vision, input from emerging fields, oversight, and in-depth coverage of key technical and policy issues.

Today, virtually every major metropolitan area in the world has a technical transportation process patterned after that of the United States. Yet no other country has replicated the mandatory nationwide urban transportation planning process, and no other country—except China—has attempted anything as ambitious as the Interstate program. No other country has devised a process that allows state and local officials to allocate formula-apportioned funds between highway and transit to serve local conditions, priorities, and needs.

Looking Ahead

The urban planning provisions of the Federal-Aid Highway Act of 1962 were pivotal in the transition of the highway program from a rurally oriented, civil engineering-based activity to a new framework that had a major urban component; that was multimodal, interdisciplinary, and involved local officials; and that was unique in the federal system. No other federal program had or has since tied capital expenditures to the results of a planning process that gives state and local officials a veto over proposed expenditures.

Technically the practice of metropolitan transportation planning may vary by the size of the area, but in all instances, it is data driven, analytically complex, and interdisciplinary.

This year, Congress reauthorized highway and transit programs, and President Obama signed the bill into law. The planning provisions have survived the test of time, and the unique legislative requirements, simply defined in 1962 as continuing, comprehensive, and cooperative, remain central to the legislated planning process.

A host of new issues confronts federal, state, and local officials today and will increase in the future. Changes in vehicle technology, in infrastructure financing practices, and in toll collection methodology, along with continually evolving techniques for planning analysis, provide ample challenges for the planning process.

Acknowledgments

This article and the accompanying sidebars represent a joint effort by members of the TRB History Committee, chaired by Jonathan L. Gifford.

The planning process will adapt as high-occupancy toll lanes and other new technologies change the face of transportation in the United States.



Photo: Virginia DOT