

# DEVELOPMENT OF TRANSPORTATION IN NEW JERSEY

## Earliest Overland Routes

The story of growth and progress in New Jersey also has been the history of the development of transportation in its area. From a handful of Indian trails and natural waterways, the state's transportation system evolved into complex networks of highway, rail, air and marine facilities.

The past century has seen New Jersey transformed from a sparsely populated agricultural state to a highly urbanized one with a dynamic, versatile, industrial productivity.

During those decades it became a recognized fact that the movement of people, products and materials in a safe and expeditious manner was vital to the lifeblood of our highly developed and complex economic system. This is even more true today.

In this booklet we briefly outline the history of transportation in New Jersey from colonial times through the establishment in 1966 of the New Jersey Department of Transportation, which has a mandate to promote an integrated, balanced and efficient statewide transportation system.

We acknowledge our indebtedness to the New Jersey Historical Society whose publication, "New Jersey — A History," has been our principal source about the state's early roads.

We believe you will find the following contents not only informative but interesting.

Bureau of Public Information  
Division of Central Services  
New Jersey Department of Transportation  
January, 1970

## ADMINISTRATORS — 1892 TO 1970

### Dates of Service

#### 1892-1894

Edward Burrough, as president of the State Board of Agriculture, was made responsible for administration of the 1891 State Road Aid Law.

#### 1894-1895

Mr. Burrough was appointed State Commissioner of Public Roads under a May 17, 1894, act creating that office.

### Others who served as Commissioner of Public Roads were:

#### 1895-1905

Henry I. Budd

#### 1905-1908

Elijah C. Hutchinson

#### 1908-1911

Frederick Gilkyson

In 1909, the legislature initiated a four-member State Highway Commission, which included the commissioner.

#### 1911-1917

Col. Edwin A. Stevens

On March 3, 1917, a new act provided that a State Highway Department be governed by an eight-member State Highway Commission which would select a chairman at its organization each year.

### The following chairmen served from 1917 to 1935:

#### 1917-1920

John W. Herbert, Helmetta

#### 1920-1923

George L. Burton, South River

The State Highway Commission was reduced to four members in 1923 and retained that number until 1935.

#### 1923-1933

Maj. Gen. Hugh L. Scott, Princeton

#### 1933-1935

Col. Arthur F. Foran, Flemington

In 1935, legislation again set up a single commissioner, to be appointed by the governor.

### State Highway Commissioners since 1935:

#### 1935-1942

E. Donald Sterner, Belmar

#### 1942-1950

Spencer Miller, Jr., South Orange

#### 1950-1954

Ransford J. Abbott, Red Bank

#### 1954-1966

Dwight R. G. Palmer, Short Hills

#### 1966 (Jan; July)

Russell H. Mullen (Deputy; Acting), Hamilton Township

On December 12, 1966, the legislature passed the "Transportation Act of 1966," which established an overall Department of Transportation to be administered by a single commissioner appointed by the governor.

### Commissioners of Transportation:

#### 1966 - 1970

David J. Goldberg, Lawrence Township

#### 1970 -

John C. Kohl,

THE EARLIEST VESTIGE of what might be considered highways in New Jersey were the trails that connected seasonal hunting grounds of the native Indians. It was from the network they formed that the earliest roads grew.

Largely footpaths only twelve to eighteen inches in width, they connected the natural waterways and inland points and provided long overland routes.

The three major overland trails in use before 1700 by the English and Dutch were known as the Minnisink Trail, the Upper Road, and the Old Burlington Path.

The Minnisink Trail afforded a route for the Minnisink Indians to travel from their Pennsylvania hunting grounds to the seashore. There they obtained fish for food and shells for wampum. The trail started at Minnisink Island, in the Delaware River below Port Jervis, went north of Morristown, west of Springfield, six miles west of Elizabeth, four miles west of Amboy, through Shrewsbury, then to the sea.

The Upper Road, or High Road, was an adaptation of several trails by the Dutch and afforded a route between New Amsterdam and their Lower Delaware settlements. It started at Elizabethtown, passed through Woodbridge and Piscataway, New Brunswick, Kingston, Princeton, Trenton, into Pennsylvania to Bristol and Philadelphia, and on to New Castle, Delaware.

A variation of this route branched off about five miles past New Brunswick, went down through Cranbury and Burlington, and crossed the Delaware River into Pennsylvania at Mattinicunk Island halfway between Burlington and Bristol.

The Old Burlington Path originated in Monmouth County near Sandy Hook, passed through Shrewsbury, Middletown, skirted Freehold, and went through Allentown, Crosswicks, Bordentown, Burlington, and Haddonfield on its way to Salem.

Both the Upper and Lower Roads, as well as the Old Burlington Path, became known as The King's Highway.

### First Public-Road Legislation

The first movement toward formalizing roads, as such, came in 1673. At that time the General Assembly of the Province of East Jersey passed its first Public Roads Act. This was followed in 1676 by the second Public Roads Act, aimed at providing a road from Middletown to Piscataway.

The road-building horizons were widened in 1682 when the General Assembly passed an act for "making and settling of highways, passages, landings, bridges and ferries . . . fit and apt for traveling" and named specific men in each county to lay out and build roads — the expense to be met by county taxes.

Under that act, roads were opened in all directions, connecting the existing two main roads at various points and linking then-existing plantations, farms and growing towns. The impetus lasted into the beginning of the eighteenth century. It was early in this period that a route later to be known as the Lower Burlington Path was established. It started at Perth Amboy, where a ferry connected to New York, and went through South Amboy to join the Old Burlington Path.

The Province of West Jersey first officially felt the need for a road system in November, 1681, at which time its General Assembly required that a road be built connecting Burlington and Salem. In 1684 it enacted several more road projects between Delaware River towns.

### Early Roads Primitive

The earliest roads achieved little distinction in the ways of safety or comfort. The evolution of most from Indian footpaths to horse-and-rider trails, and then to a width sufficient to accommodate a wagon or coach, left much to be desired. Little pains were taken with the roadbeds, and even the traveler on horseback had to be wary of the stumps and mudholes.

By the eighteenth century, the two Jerseys still had little in the way of formal roads and the roadbuilding process was very slow. Although counties and townships had some authorization, they had little power to collect taxes. The road work was largely dependent upon compulsory road service required of all inhabitants. The law usually limited such service to six or eight days a year.

Natural earth was the universal roadbed. Steep grades, deep ruts and seas of mud were common. Sometimes, attempts were made to alleviate these conditions by laying tree trunks across the roads — a device known as "corduroying." Coaches frequently overturned. The ruts were so deep that the driver would get assistance from the passengers in keeping the coach upright by calling for shifts of weight: "Now, gentlemen, to the right 'or' Now, lean to the left!"

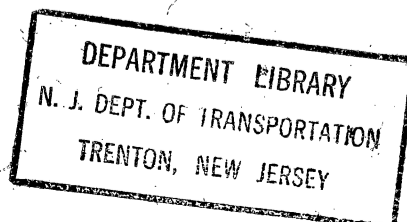
### Post-Revolutionary Road Conditions

After the Revolution, there was a rapid increase in the use of vehicles and, as a result, the roads were increasingly in disrepair. The compulsory labor system broke down. Taxes were inadequate, also hard to collect. The trip from New York to Philadelphia by stage coach took two days.

It cost about as much to transport goods as it did to produce them; in some instances, it cost more. Salt, for example, sold for a penny a pound at the shore, but sold for six cents a pound inland.

In the latter half of the eighteenth century, the science of roadbuilding was beginning to be recognized. In England, turnpike companies were established to improve the roads. The 400-mile trip from Edinburgh to London took 12 to 16 days earlier in the century, and there was one stage coach a month. By 1783, the roads had been improved to such an extent that there were 60 coaches a month and the trip was made first in four days and later in 60 hours. In America at the same time, coaches were making only 20 to 25 miles a day.

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New Jersey State Library



#### Early Major Road Trails

New Jersey and New York inaugurated systems under which major roads were built by the state but maintained by the townships. New York also put in effect a plan under which land grants were offered to those who built roads. Money grants were made to townships to repair roads and build bridges.

English roadbuilding methods were called to the attention of the New Jersey legislatures. In 1788, Pennsylvania started talking about a turnpike for the Lancaster Road and, after resorting to lotteries to make repairs, finally granted turnpike rights to a private company.

New Jersey also tried the lottery idea for quite awhile, but a private company was formed in 1795 to build a road from Philadelphia to New York. It was estimated to cost \$300,000. About one-fourth of this was subscribed, but the plan lapsed.

#### Turnpike Eras

The First Turnpike Era, so called, was about 1801-1828. Actually, in 1785 there was a Maryland-to-Virginia proposal by a company headed by George Washington.

New Jersey rapidly became one of the greatest travel corridors in the United States, mainly because of its position between New York and Philadelphia.

In 1801, the legislature granted a charter to the Morris Turnpike Company for the first turnpike. This was from Elizabeth, through Springfield, Morristown, Succasunna, Stanhope, Newton and Culver Gap to the Delaware River opposite Milford, Pa.

In 1802, the legislature authorized the Belleville Bridge and Turnpike Company and the Bergen Turnpike Company. The Bergen Turnpike, on which tolls were collected for more than a century, led from a ferry in Hoboken, across Overpeck Creek and the Hackensack River to Hackensack.

In 1804 at the height of the turnpike movement, the Trenton-New Brunswick and the Newark Turnpikes were authorized. They made up part of what was to become the most important through highway from New York to Philadelphia, U.S. Route 1.

The Trenton-New Brunswick Road was finished in 1807. Albert Gallatin, U.S. Treasury head, reporting on a national road a year later, described it as "36 feet wide, 15 feet of which are covered with about 6 inches of gravel." A few wooden bridges with stone abutments and piers were included. The cost for the 25-mile stretch was about \$2,500 a mile.

Except in one instance, New Jersey took no part in the movement to give state aid to turnpike companies. The one exception was the Newark Turnpike, for which the governor was authorized to subscribe \$12,500 for company stock.

1806 saw the chartering of the Newark-and-Pompton and the Paterson-and-Hamburg Turnpikes. The former ran from Newark (N. Broad Street) through Bloomfield to Pompton. The latter ran from Acquackanock Landing (now Passaic) through Paterson, Pompton, Newfoundland, Hamburg and Deckertown (now Sussex) to the Delaware River opposite Milford, Pa. An extension carried one branch to the Passaic River at Belleville. Another went from Passaic to the Hackensack-and-Hoboken Turnpike on the same line that was later used for the Paterson Plank Road. It served chiefly as a farm-to-market road to New York City.

The first New Jersey Turnpike, also chartered in 1806, ran from New Brunswick through Bound Brook, Somerville, Potterstown and Bloomsbury to Phillipsburg on the Delaware River. It was later extended to Perth Amboy through Metuchen.

The Bordentown-and-South Amboy Pike came along in 1816 as part of the New York-Philadelphia route.

Between 1801 and 1828, charters were granted for 54 turnpike companies, but only about 30 turnpikes were actually built. About 500 miles of roads were constructed, and the surfacing was mostly dirt and gravel.

The three biggest centers of the state network in this period were Newark, Morristown and Paterson. Three thoroughfares ran between Philadelphia and New York: Trenton, New Brunswick and Newark; Bordentown and South Amboy; and Lambertville, Somerville, Plainfield and Newark.

Between 1828 and 1849, only five new turnpikes were chartered. But, in 1849, with the new plank-road enthusiasm in full swing, 10 new roads were legislated and during the next turnpike era of a quarter century some 200 companies were chartered. Most of these were in the south sections of the state where Camden and Mt. Holly became road centers.

Some states permitted construction of free roads from one point on a turnpike to another. These were known as "shunpikes." The turnpikes were successful in getting legislation against such roads. A New Jersey act provided a penalty of three times the legal toll for getting on a shunpike and avoiding passing through the turnpike's toll gate. Other New Jersey acts provided that a person who willfully broke or defaced a road marker or mile stone, damaged a gate, or forcibly passed through without paying toll, be subject to a fine of \$20 in addition to a civil suit for damages.

#### Early Turnpike Construction Methods

A turnpike company was given two years from the date of its charter to begin construction. Generally, the time allowed for building varied with the length of the proposed route.

Even the poorest turnpikes, however, were built with some scientific features in mind — distances were shortened by keeping the roads from winding more than necessary; grades were diminished; roadbeds were raised and given a proper shape for drainage; ditches were provided and bridges were built over intervening streams.

The contracts were let usually for five- or ten-mile sections. The contractors lived along the route and generally were members of the turnpike company. Labor was drawn from the surrounding area, and the work was usually done in late summer and early autumn when farm work was the least pressing.

The first job was to clear the right-of-way of timber and then take out the stumps and large rocks. The roadbed was then raised by throwing earth from the sides to the center, automatically creating drainage ditches on both sides of the road. In many instances this bed remained as the riding surface.

The surfacing varied. Most legislation provided the road "shall be bedded with stone, gravel, sound wood or other hard substances, well compacted together and of sufficient depth to secure a good solid foundation." In New Jersey, roads were almost entirely earth and gravel. New York law required a facing of gravel or broken stone to a depth of nine inches. Actually, the surface was formed of whatever was available in the vicinity.

For stone-faced turnpikes built during this era, most surfacing was done by the following Telford method. The lower part of the stratum was composed of stones broken into pieces five to eight inches in diameter. Over this was spread a layer of one-half to two-and-one-half-inch stones for a depth of six inches in the center, falling away to three inches on the sides. Over this was spread a thin layer of stone dust, gravel or coarse sand to help bind the materials together.

Early engineers began to doubt the need for these different sizes of stones. By 1830 the macadam system of compacting a layer of small broken stones on a convex, well-drained, earth roadbed became the popular type of construction.

Compacting of the surface, despite the turnpike legislation calling for it, was seldom accomplished. Therefore, travelers would use the "summer roads" when possible to avoid the covering of loose stones and gravel in dry seasons.

#### Canal and Railroad Era

Canals and railroads drove the turnpikes out of existence. Canal building had begun in other states virtually with the turnpikes. Railroads followed in the 1830's, the first being used in 1826 to carry coal from Mauch Chunk, Pa.

New Jersey was late with canals. The Delaware and Raritan Canal, begun in 1834 and completed in 1838, was one of the most successful ever built. The Morris Canal opened in 1836.

The canals lowered freight rates substantially. The Erie Canal, for example, dropped rates from Buffalo to New York from \$100 to \$5 a ton and cut the time to one-third.

#### Plank Toll-Road Movement

Toll roads came back into the picture in 1849 with the plank road movement. These had floors of sawed timber and were regarded as the cheapest and easiest type to build. They began in Russia early in the 1800's and were introduced in Canada in 1834, after which their use spread to the United States.

Before the era ended, New Jersey had 25 such roads. At least \$10,000,000 was spent in building about 7,000 miles of planked roads in New Jersey, New York, Pennsylvania and Maryland. They were small enterprises ranging from \$4,000 to \$100,000, few of which exceeded \$50,000, and were usually financed by individuals and business interests along the roads.

They were the smoothest roads built in their time. Normally built right on top of existing roads, they consisted of a base of 3-inch thick and 6-inch wide hemlock laid 6 inches apart and overlapping, and filled in with well-rammed earth. A 3-inch thick wooden floor 8 to 11 feet wide was built on top of that. Because approaching and overtaking vehicles had to run one set of wheels off the planking in order to pass, shoulders were made even with the planks. Cost of construction ranged from \$1,000 to \$5,000 a mile, with the average being about \$1,800 a mile. Two-animal vehicles paid tolls of about 1½ cents a mile. Life of the planking was about 5 years.

#### More Macadam Roads

By the turn of the century, a new and powerful voice had been added to the clamor for still better roads. In addition to the farm-to-market group, the large membership of bicycle clubs became a demanding factor. They needed hard-surfaced roads to accommodate their wide activities. The answer was an increase in the number of roads surfaced with water-bound macadam.

This type of smoother surfacing consisted of a layer of large pieces of broken stone, the voids of which were then filled with smaller pieces of stone and stone dust. The smaller aggregate and particles were flushed in with water. Surplus material was brushed into the top of the layer to form a relatively smooth surface. A tightly knit pavement resulted when the material dried, as a natural cementing action took place to some degree.

#### First State Aid for Public Roads

In 1891, New Jersey moved to the foreground in the national roads picture by becoming the first state to grant state monetary aid in the building of public roads. The legislative act that accomplished this provided aid to the counties in the construction of highways to the extent of one-third of their cost, and appropriated \$75,000 annually to be expended by the state's Secretary of Agriculture as administrator of roads.

#### First State Commissioner of Public Roads

The legislature followed through in its recognition of the need for improved roads by providing for the appointment of a State Commissioner of Public Roads in 1894. The commissioner was required to perform all duties with respect to the public roads of the state that had previously been assigned to the Secretary of Agriculture in 1892. In addition, he was authorized to collect data with respect to permanent highway construction that would best serve the interests of the public.

#### First State Highway Commission

The next important step in New Jersey highway development occurred in 1909 with creation of a State Highway Commission by the legislature. The commission consisted of the Governor, President of the Senate, Speaker of the House, and the Commissioner of Public Roads. The main function of this commission was limited to supervising preparation of a plan for an "Ocean Highway" from Atlantic Highlands to Cape May.

#### First State Highway System

In 1912, the legislature recognized the need for an integrated system of state-built highways. It directed the State Highway Commission to establish a comprehensive network of roads to be known as the State Highway System which was not to exceed 1,500 miles.

Under this act, an overall state highway plan really took hold and began to grow. In 1912, New Jersey laid its first section of concrete highway at New Village in Warren County. In the ensuing period, highways were laid out with more durable characteristics, and the automobile came into prominence.

#### *First State Highway Department*

In 1917, the state legislature again stepped conspicuously into the highway picture. A new act created a State Highway Department to be governed by a State Highway Commission of eight members, two of which were required to be qualified and competent engineers. The governor was designated as a member ex-officio, and the commissioners were appointed by the governor with the advice and consent of the senate.

#### *Original 15 Routes Legislated*

At the same time, the legislature spelled out the nucleus of the State Highway System of today by designating 15 routes as the system. It provided that existing highways could be used wherever convenient to do so, but allowed the commission to build new ones over acquired rights-of-way and others in continuation of, connecting with, or in addition to those legislated.

The original 15 routes were described as follows:

*ROUTE NO. 1. From Elizabeth to Trenton by way of Rahway, Metuchen, New Brunswick and Hightstown.*

*ROUTE NO. 2. From Trenton to Camden, by way of Bordentown, Fieldsboro, Roebling and Burlington.*

*ROUTE NO. 3. From Camden to Absecon, by way of Berlin and Hammonton.*

*ROUTE NO. 4. From a point on Route No. 1 in or near Rahway to Absecon, by way of Perth Amboy, Keyport, Middletown, Red Bank, Long Branch, Asbury Park, Point Pleasant, Lakewood, Toms River, Tuckerton and New Gretna.*

*ROUTE NO. 5. From Newark to the bridge crossing the Delaware River about two miles above Delaware, by way of Morristown, Dover, Netcong, Budd's Lake, Hackettstown, Buttsville and Delaware.*

*ROUTE NO. 6. From Camden to Bridgeton and Salem, by way of Woodbury, Mullica Hill, Woodstown and Pole Tavern.*

*ROUTE NO. 7. From Hightstown to Asbury Park, by way of Freehold, Jerseyville and Hamilton.*

*ROUTE NO. 8. From Montclair to State line at Unionville, by way of Singac, Wayne, Pompton Plains, Butler, Newfoundland, Stockholm, Franklin Furnace, and Sussex.*

*ROUTE NO. 9. From Elizabeth to Phillipsburg, by way of Westfield, Plainfield, Bound Brook, Somerville, White House, Clinton, West Portal and Bloomsbury.*

*ROUTE NO. 10. From Paterson to Fort Lee Ferry, by way of Dundee Lake and Hackensack.*

*ROUTE NO. 11. From Newark to Paterson, by way of Belleville, Bloomfield, Nutley and Passaic.*

*ROUTE NO. 12. Paterson to Phillipsburg, by way of Little Falls, Pine Brook, Parsippany, Denville thence over Route No. 5 to Budd's Lake, thence to Washington and Broadway.*

*ROUTE NO. 13. New Brunswick to Trenton, by way of Kingston, Princeton and Lawrenceville.*

*ROUTE NO. 14. From Egg Harbor City to Cape May City, by way of Mays Landing, Tuckahoe and Cape May Court House.*

*ROUTE NO. 15. From Bridgeton to Cape May Court House, or such other point on Route No. 14 as may be determined by the State Highway Commission.*

#### *More and Better Roads*

Following World War I, the automobile came into more common use and the need for more and better highways was shortly evident. Also, the demand was created to "get the farmer out of the mud," and this resulted in many hard-surfaced roads being constructed by counties as well as by the state in the more sparsely settled sections. Late in the 1920's, roads were widened to three lanes, and emphasis was placed upon the further development of intersections. This was the period when New Jersey built its first cloverleaf and first traffic circles, as well as its first divided roadways.

State highway expenditures reached a new peak in the early 1930's when many new routes were built and dual highways became the design standard where traffic volumes justified their construction.

Bridge design also underwent a change during this period. The trend was more and more to the high-level permanent type of bridge rather than the movable bridge which held up traffic, the volume of which was increasing rapidly each year.

#### *State Highway Commission Changes*

Organizational refinements of the Highway Department were undertaken by the legislature during the 1920-1940 period of highway construction and expansion. In 1923, the eight-man State Highway Commission was replaced legislatively by a four-member commission.

Then, in 1935, the four commissioners were completely supplanted by just one State Highway Commissioner to serve under the governor as administrative and executive head of the department. This structure prevailed until December 12, 1966, by which time transportation conditions in the state and its region had constantly and vastly changed.

#### *Emergence of Department of Transportation*

In the late 1920's and early 1930's, New Jersey had achieved a national reputation for its enterprise and excellence in the transportation field. Its highways, bridges and intersection innovations were among the prime engineering achievements of that period and were widely emulated. Its railroad system was among the best.

In the 1930's, the nation suffered its most severe economic depression; in the 1940's, the costliest world war thus far; and thereafter, an uncertain 'cold' war in many parts of the world. In that generation of ferment, the attempts of New Jersey to meet its ever-mounting transportation problems began to become confronted with rapidly increasing difficulties of various sorts.

From 1948 to 1969, the total travel on New Jersey's highways tripled until it totaled about 37 billion vehicle-miles a year. Recent projections indicate there will be 72 billion vehicle-miles traveled on New Jersey highways in 1990, or about double the mileage for 1969. Also, projections of population and transportation trends to 1990 indicate that the state is facing a population expansion in excess of 10 million and that demands by state highway users will be increasingly tremendous.

After the federal census of 1960, New Jersey became by far the most densely populated state in the nation. It is right in the middle of the rapidly evolving Boston-to-Washington megalopolis. The state's ratio of motor vehicle registrations to inhabitants is now practically two to one.

However, for the railroads, it has been a completely different story. These carriers once had a dominant role in transporting people and goods, and they prospered. Autos, trucks, buses and airplanes have long since changed that picture. Rail revenues, particularly from passenger service, dropped steadily and drove some carriers to insolvency and others to the brink.

#### *Prelude — Railroad Transportation Division*

The commuter rail transportation activities of the department were initiated in late 1958 when the governor requested the commissioner to study New Jersey's commuter rail problem and make recommendations toward its solution. Early in 1959, in advance of shutdown of the West Shore Division of the New York Central Railroad and the ferry which transported many passengers across the Hudson River at Weehawken to New York City and back, the commissioner made suitable arrangements with bus lines serving the area so that when the shutdown occurred no commuters were inconvenienced.

Spurred by this experience and other impending cutbacks in rail transportation, legislation creating a Division of Railroad Transportation within the then State Highway Department was enacted on March 4, 1959. Thereafter, extensive studies were conducted into all phases of the commuter problem. In April, 1960, the division released a report containing suggestions for immediate remedial action and long-range proposals. This met with wide public acclaim and the commissioner negotiated contracts with all major commuter lines ensuring continuation of 96 percent of the essential passenger service in the state. The program cost at the start was less than \$6 million a year, or less than the construction cost of one mile of modern freeway in an urban area, and it stimulated the carriers to help their own situation.

After prolonged negotiations, in which the commissioner represented New Jersey, legislation was enacted directing the Port of New York Authority to acquire, rehabilitate and operate the Hudson and Manhattan Railroad in conjunction with construction of a World Trade Center on the west side of Manhattan in the area of the railroad's present terminal. Largely as a result of the department's insistence, this program included provision for transfer stations in the Jersey Meadows to link up with New Jersey commuter railroads, a new bus terminal in Jersey City, and committed the Port Authority to spend up to an estimated \$10 million a year on mass transit, even as a deficit operation.

In the field of aviation, there had developed a critical need for a major new air terminal to accommodate the burgeoning needs of air travel. Existing airport facilities in the metropolitan area had become heavily overtaxed. Predictions of sharp increases in air traffic in the coming decade stagger the imagination.

#### *First Transportation Department Established*

It was an awareness of big separate deficiencies in all areas of transportation, as well as deep concern about the great challenge of the future, that prompted establishment of the Department of Transportation on December 12, 1966 by the state legislature.

New Jersey was the first state to adopt the concept of an integrated approach to all transportation problems. Even the U.S. Department of Transportation did not become operational until nearly four months later.

Under the Transportation Act of 1966, the newly created Transportation Department absorbed the functions of the State Highway Department and the Bureau of Aeronautics from the Department of Conservation and Economic Development.

The law provides for a Commissioner of Transportation to head the department, to be appointed by the governor with the advice and consent of the senate. In essence, the act directs the commissioner to assume the following responsibilities:

1. Develop and maintain a comprehensive master plan for transportation development.
2. Develop and promote programs to foster efficient and economical public transportation services in the state.
3. Prepare plans for the preservation and improvement of the commuter railroad system.
4. Develop plans for more efficient public transportation service by motor bus operators and facilitate more effective coordination between bus service and other forms of public transportation, particularly the commuter railroads.
5. Cooperate with interstate commissions and authorities, state agencies, appropriate federal agencies and interested private individuals and organizations in the coordination of plans and policies for the development of air commerce and facilities.

The Commissioner is empowered to appoint principal subordinates to assist him in carrying out his duties: an Assistant Commissioner for Highways who administers functions relating to design and development of highways and an Assistant Commissioner of Public Transportation who administers functions relating to public transportation.

#### *Transportation Department Responsibilities for Commuters*

A major policy-making body in the department is the Commuter Operating Agency. It consists of four members: the Commissioner of Transportation, the Assistant Commissioner for Public Transportation, the State Treasurer and the President of the Board of Public Utility Commissioners, or persons designated by them.

This agency has the authority to contract with rail and bus carriers to conserve and improve necessary commuter services and to contract for improvement of capital facilities essential to those services.

The Transportation Act of 1966 also authorized establishment of a Commuter Advisory Committee consisting of the Assistant Commissioner for Public Transportation as chairman and ten other members appointed by the governor. These ten are comprised of: two citizens of the state who are commuters; two mayors of municipalities or two freeholders of counties served by railroads under contract to the state; two officials of unions representing employees of railroads under contract to the state; two officials of railroads or bus carriers under contract to the state; and two public members who are citizens of the state.

This committee's duties are to consult with and advise the Transportation Commissioner on problems of commuter railroads and to conduct such studies of specific commuter matters as the commissioner may direct.

One of the new Transportation Department's major accomplishments was the launching of the first phase of its Aldene Plan (named from a major junction near Newark). This project, a major consolidation of the passenger services operated by the Central Railroad of New Jersey, went into effect April 30, 1967, shortly after the railroad had filed a petition of bankruptcy. It involved rerouting of the Jersey Central's mainline and shore passenger trains into Newark's Pennsylvania Station over the rights-of-way of the Lehigh Valley Railroad and the Penn Central Company.

At Newark, Jersey Central passengers have options of taking Penn Central trains to Pennsylvania Station in New York City, Port of New York Authority (PATH) trains to Hudson County cities and to downtown and midtown Manhattan, or the Newark subway and various bus routes to New Jersey points and uptown Manhattan.

The project involved new track connections, terminal and storage-yard installations, track and signal improvements, a new passenger station, elimination of grade crossings and rehabilitation of passenger cars. It was financed by the state plus federal assistance approved by the Housing and Home Finance Agency. The Aldene Plan, expected to effect a saving of about \$1.5 million a year, made possible the abandonment of the Jersey Central's passenger terminal in Jersey City, its antiquated and costly ferry service, and the passenger terminal in Newark.

In another early 1967 move to preserve and improve essential commuter service, the department awarded a \$9.9 million contract for manufacture of 35 stainless-steel, high-speed electric passenger cars for use by the Penn Central Company (formerly the Pennsylvania and New York Central Railroads), principally on its main line between Trenton and New York City. The state and federal governments share the cost of these cars. Penn Central will lease the cars until 1977 and maintain them. This arrangement substitutes for the state's monetary type of operating subsidy as made available to the other railroads. The first cars went into service between Trenton and Pennsylvania Station, New York City, on October 30, 1968.

Also, a site was recommended near the Garden State Parkway in Woodbridge for a suburban passenger station to be on the New York-Washington high-speed run of the Penn Central. In late 1969, initial contracts were awarded to construct this "MetroPark" station.

#### *Early Aeronautics Regulations*

In the field of aeronautics, New Jersey has pioneered in its advancement and regulation. As early as 1913, the legislature passed a law to regulate flying exhibitions. In 1929, it was among the first to adopt the "Uniform State Law of Aeronautics," which set up regulatory standards.

The State Department of Aviation, the office of the State Director of Aviation, and the State Aviation Commission were created by the legislature in 1931. Regulatory measures for aviation also were enacted, and these were later modified and expanded, principally in 1939, 1952 and 1964.

In 1946, the federal government established the National Airport Plan for a nationwide network of airports to meet commercial and military emergency needs. The plan provided for federal matching grants to states for construction of public airport facilities. Grants to New Jersey totaled more than \$20 million up to mid-1969.

From 1946 to 1969, more than 100 airports and 160 air schools, flying clubs and related facilities came into existence in the state.

In 1948, after the departmental reorganization set by the new state constitution of a year earlier, all aeronautic functions were transferred to the Department of Conservation and Economic Development. This group was transferred to and given divisional status in the Department of Transportation when the department was created in 1966.

Among some of the functions of the Division of Aeronautics are: licensing of airports, heliports, parachute centers, and air meets; insuring adequate enforcement of licensing, registration, inspection and investigation policies; developing a system of airports; promoting of progress and education in aeronautics; and cooperating with federal agencies concerned with aeronautical development.

#### *Transportation Department Responsibilities for Highways*

Vested in the Department of Transportation, of course, are the continuing stewardship and development of all of the elements of the State Highway System.

Carrying out these responsibilities involves a group of important processes and operations such as planning, design, right-of-way acquisition, materials control, construction, traffic engineering, maintenance, and local government aid.

#### *Highway Planning*

In the planning for new facilities and the expansion of existing ones, the department must constantly gather and analyze numerous statistics. This information is used for various purposes.

For instance, in one area it may point up the need for a completely new highway alignment or perhaps only widening an existing roadway. Or, at another location, it may substantiate the desirability of constructing an overpass, or justify only some channelization and traffic signals.

Some of the other main areas of planning activities are development of departmental master plans, formulation of construction programs, preliminary location of new route alignments or corridors, and urban planning.

#### *Highway Design*

The engineering-design group develops and refines highway alignments, produces final construction drawings for highways and bridges, and provides comprehensive subsurface data as bases for all work. It also designs road-drainage systems and waterway openings and plans relocation of utilities. In addition, it processes plans, specifications and estimates for construction contracts.

#### *Purchase of Land for Highway Needs*

The process of right-of-way acquisition includes making property appraisals, establishing fair-market values, and negotiating sale agreements. Also, this process provides relocation assistance, monetary payments and reimbursement, and moving-cost aid.

#### *Highway Materials Control*

This area of work includes the quality control of all materials coming directly to the department and also those delivered to the construction site or the maintenance location.

Many materials are quality-controlled at the source through inspection at the supplying plants by departmental personnel. Tests are performed in the department's laboratory on all construction and maintenance materials. Field inspections and testing are made of bituminous and portland cement concrete and soil aggregates.

#### *Highway Construction*

The construction function of highway operations is as old as the original department itself. For more than five decades, the department has administered construction and improvement programs that have increased steadily in size to about \$484,000,000 for fiscal 1969.

These programs have included widenings, center barriers, intersection improvements, jughandles, overpasses, creeper lanes, dualizations, and resurfacing, besides entire new highways.

#### *Highway Maintenance*

The maintenance function of the department is to keep the State Highway System in generally good condition. This means that continual inspection and repair of highways and bridges are made; that storm drains are kept functioning properly; that pavements are cleared of snow and ice; that litter is removed and grass and landscaped areas kept neat; that movable bridges are kept in operating condition; that traffic signals are kept performing properly; that approved signs are provided, renewed and replaced; that reflective lines are renewed periodically; and that many other acts of preventive maintenance and repair are performed.

#### *State Aid to Local Governments*

State monetary aid by the department to counties and municipalities has been in effect since 1947. The funds are distributed mainly under legislated formulas reflecting area, road mileage and population each calendar year. They are used for such varied purposes as construction, reconstruction, maintenance and repair, lighting and policing of roads and bridges. Limited amounts also may be applied for debt service on roads and bridge bonds.

State aid averaged about \$17 million per year from 1957 through 1966. For only 1967, the legislature supplemented through a new state sales tax the annual state aid appropriation with special grants of \$20 million to counties and \$14 million to municipalities, for an overall total of \$51 million.

The great increase in traffic volumes led the department in 1967 to reexamine the state aid program. Department officials felt that state aid funds should be applied toward further development of the secondary network which augments the State Highway System. Under the existing state aid program, about 70 per cent of the funds were being spent for such items as maintenance materials and payroll costs and did not serve to improve the overall state-road network. In effect, these funds were serving mainly as local tax relief.

The department obtained legislative cooperation through the enactment of a 1967 law to spur construction of additional local feeder and arterial roads needed to connect with the State Highway System. The new act established a State Aid Road System selected from many county roads and some municipal ones. This comprehensive and integrated network is being improved according to state specifications. Counties are required to match the state's contribution for each project; municipalities provide only 25 per cent. All State Aid Road System funds are limited to only construction, reconstruction or betterment. For 1969, as in previous years, these totaled \$15 million.

Of the 2,239 miles of federal-aid secondary roads in New Jersey up to 1968, over 90 per cent were under county jurisdiction. This system is financed 50 per cent from federal funds which amount to about \$2 million a year. Matching funds are provided by the state or counties, with the major share coming from the counties.

In its function of supplying local government aid, the department is both distributor and watchdog of state funds, and supervisor of the work. Supervision includes inspecting construction, advising in the preparation of plans and specifications, reviewing these, and acting as final authority in awarding contracts.

#### *Highway Design-Speed Determination*

In the design of new highways, the basic consideration is the movement of the maximum number of vehicles at speeds which are consistent with safety. The department uses "design speed" as the basic factor in determining sight distances and banking of curves. The higher the speed, the farther a driver must be able to see and the steeper a curve must be banked.

#### *Highway Curve Design*

In the past, the department built curves as sharp as the arc of a circle with a radius of 900 feet. The present standards aim for a radius of at least 6,000 feet where possible. Where design speeds indicate the need, one side of a curve on a road may be banked as much as 6 percent higher than the other side.

#### *Flattening Highways*

Sometimes there is the need to "iron out the hills and hollows" for new roads. The federal Bureau of Public Roads sets strict standards which allow grades of 5 percent in ordinary cases — that is, a 5-foot rise or fall within 100 feet — and 7 percent in unusual circumstances. Where New Jersey once built roads with 6 percent grades, they now strive for 2 percent.

#### *Acceleration and Deceleration Lanes*

Some new highways are built with acceleration and deceleration lanes which permit motorists to pick up speed before entering the main stream and to leave the main roadway before slowing down. These lanes are 600 to 1,200 feet in length.

#### *Freeways*

Interstate routes are built as multi-lane, divided "freeways." Freeways have no conventional at-grade intersections. Entrances and exits are provided by ramps to and from overpasses as parts of interchange systems. Traffic pulling on and off main highways near roadside businesses, homes and cross streets has always constituted a hazard. The freeway, or limited-access highway, is designed to eliminate this danger. There are no marginal developments, private entries, or at-grade roads directly open to freeways. The name does not relate to freedom from tolls, as a freeway may be a toll highway.

#### *Highway Bases and Surfaces*

Drainage of soils and surfaces is one of the main problems in designing new highways. Water is often present and an insidious enemy. It could freeze and expand underneath a road, causing it to heave and break up, if it is not drained away properly. It may form puddles or slick the surfaces of roads.

North of Trenton to Perth Amboy, soil in New Jersey contains more clay, making for poorer drainage, so a 12-inch subbase is used for roadbeds. Southward, the department uses an 8-inch subbase composed of sandy gravel.

Concrete roads are built 9 inches thick directly on top of the subbase. They are reinforced with steel mats 2 inches below the surface.

Bituminous concrete roads are built by first spreading a 7-inch layer of broken stone, which is then tamped down by vibrating devices. This is covered by 2 layers of 1½-inch bituminous concrete.

The department continually experiments with improved surfacing materials. Synthetic rock asphalt, including a sharp silica sand, has shown highly satisfactory skid resistance on the Pulaski Skyway for instance.

#### *Directional Highway Signs Research*

There are now over 81,000 signs on the 2,010-mile state highway system. From 1920 to 1950, directional signs were made out of cast iron plates 2 by 4 feet and carried as many as 12 town names. The department found that the average driver could not read these signs beyond 100 feet because of too many names and too small letters.

New signs are larger and contain a maximum of 3 town names and most have 8-inch high letters. Tests have shown these can be read at a distance of 400 feet. Still bigger signs with letters as high as 16 inches are used on the highest-speed largest-volume highways such as interstate routes and other of our modern freeways.

#### *Maximum Highway-Speed Determination*

The subject of maximum legal vehicular speeds is ever present. Some limits have to be established for the first time and others may need to be modified. For the State Highway System, the Transportation Department analyzes and sets these limits. It has been making radar speed-meter surveys on the basis of significant changes in conditions on, at, or near state highways rather than by boundary lines, in order to arrive at current practical speed limits. Still other analyses may call for specifying no-parking zones or establishing no-passing areas.

All highways definitely should have realistic speed limits. There is a very pronounced tendency on the part of the drivers to ignore unrealistic ones. Truly practical limits keep most cars moving at about the same rate of speed and thus help cut the accident rate. The department uses numerous large speed-limit signs and many small ones along the highways to keep drivers alerted to the maximum prevailing limits.

#### *Highway Center Barriers*

The department conducts a continuing improvement program for the state's highway network in an effort to wipe out danger spots. The reduction in traffic deaths during recent years bears out the fact that the department definitely helped the prevention of traffic accidents by installing concrete center barriers where most needed.

On Route 4, before the addition of center barriers in 1956, there were as many as 10 deaths a year. In the first 4 years of the 1960's, in spite of constantly increasing traffic volumes, the highway fatality annual average was cut to only 5.

Head-on collisions killed 11 persons on Route 22 in Hillside during the 3 years before center barriers were erected there in 1954. There have been no head-on fatal accidents since January 1965, although this stretch is traversed by over 70,000 cars a day.

The department has built 178 miles of center barriers from 1949 up to 1969, and the program is expanding. The most common type is made of concrete, 24 inches wide at the base, 32 inches high and 6 inches wide at the top. Improved design is always being considered and tested, such as a section 27 inches wide at the base, 32 inches high, and 9 inches wide at the top.

#### *Highway Intersections and Traffic Circles*

The department's strategy of building greater safety into older roads uses the weapon of modern design against one of the most dangerous highway enemies — the busy intersection, with its direct opposition of traffic at the same grade.

New Jersey started to beat the overburdened-intersection problem more than 30 years ago with a safer at-grade design called the "traffic circle." The first one was built near Camden in 1925, and the last of 73 circles was constructed on the Trenton Freeway in 1952.

Increased traffic volumes and higher speeds have made this former innovation less and less worthwhile. Circles in places have been opened straight through, using traffic signals to permit swifter movement of through traffic, yet retain the safe turning features in all quadrants. A very busy one near Camden was reconstructed as a semi-interchange with a number of grade separations.

Conventional highway intersections also are being modernized. Sometimes, in the median, a left-turn slot can be put in to briefly hold three or more cars and protect them from the rear. Sometimes an entire intersection is redesigned by providing side lanes or channels for the various turning movements and installing traffic signals to control them. These improvements may cost from \$25,000 to \$1,000,000 each, but they reduce the confusion sometimes generated by old-fashioned wide-open intersections and increase the safety for all traffic.

#### *Highway Jughandles*

A different design to provide safe left turns and U turns at extremely busy highway intersections has a curved jughandle shape. It provides a right-turn lane which carries traffic from the main highway in advance of an intersection, then allows a left turn onto the less congested cross road, from which traffic can next cross the main highway or make a U turn onto it under traffic-signal control.

The jughandle design not only eliminates the danger of making sharp left turns into the face of heavy opposing traffic, it cuts down traffic delay at intersections. The department has built 473 jughandles from 1952 up to 1969 at an average cost of about \$50,000 each.

#### *Highway Overpasses or Grade Separations*

The department's engineers believe the one certain answer to the prevention of accidents at intersections is the overpass, which separates one highway from another. The department has built 527 overpasses from 1952 up to 1969 at a total cost of more than \$85 million.

#### *Highway Creeper Lanes*

Another safety design is the "creeper lane" which promotes greater safety on two-lane roads running through hilly terrain. It is simply an extra uphill lane for slow-moving vehicles so that other drivers need not take chances in passing. The department has built 42 of them from 1954 up to 1969. It is reasonable to assume a considerable number of lives have been saved by these creeper lanes.

#### *Highway Reflecting Lines*

One of the simplest safety features put into use, yet one of the most effective, is the white reflecting line painted on the outer edges of New Jersey state highways. The initial lining program was started in 1954 and completed in less than two years. At first the reflecting stripes were used only on blacktop roads, but public reaction was so favorable that the program was expanded to include concrete highways. Thereafter, this became a continuing maintenance program throughout the state. These outer-edge reflections, similarly to normal center-line and traffic-lane delineations, are especially helpful to drivers in fog and darkness. Thousand of small reflective beads mixed throughout the paint provide the reflective surface.

#### *Highway Shoulder Widening*

To promote greater safety for drivers who must stop along our highways, the shoulders are being widened when possible. Most recent standards call for 10-foot shoulders on regular highways and 12-foot shoulders on designated truck routes.

In addition, the department plans the stabilization of all existing shoulders that may need it to provide a firmer surface for sustaining vehicles when necessary for a brief time.

#### *Highway Dualization*

Large-scale plans concerning greater safety involve dualizing and dividing existing two-lane highways and eliminating the unsafe three-lane ones. The fatality rate on three-lane highways has been double that on divided highways.

It may take several years to completely modernize the entire length of an existing long route. This work usually includes a host of relatively smaller projects, such as closing center-island openings and constructing some jughandles and overpasses. At the same time, there may be many spots on the older pavement where poor drainage can cause puddles or ice to form and also induce the surface to break up into dangerous pot holes.

#### Highway System Mileages

By 1969, the State Highway System totaled 2,010 miles. It contained 1,072 miles of 2-lane highways, only 21 miles of 3 lanes, 719 miles of 4 lanes, 153 miles of 6 lanes, and 45 miles of others up to 11 lanes.

Also, by 1969, there were approximately 6,757 miles of county roads and 21,896 miles of municipal roads.

Toll and other roads totaled 373 miles, including the Palisades Interstate Parkway; besides 486 for state parks and institutions.

#### Highway Traffic Volumes

In 1968 the State Highway System carried about 45 per cent of New Jersey traffic — an average of 15,100 cars per mile both ways each 24-hour day, or more than 16 billion miles a year. This is 5 times the national average, 2½ times Pennsylvania's and also 2½ times New York's state-highway average volume.

Motor vehicle registrations in New Jersey increased from 765,000 in 1928 to above 3.4 million in 1968. Today there is one motor vehicle in the state for every two persons. In a number of counties, the present ratio is already more than one car for every two persons.

#### The Great Interstate System of Highways

Since 1956, the major portion of highway planning and construction in New Jersey, from a monetary viewpoint, has been devoted to bringing toward reality over 412 miles of the newest and most modern freeways that will comprise New Jersey's part of the 42,500-mile National System of Interstate and Defense Highways. 90 per cent of this huge system is being financed by the federal government from Highway Trust Fund monies dedicated to that single national purpose and administered through the Bureau of Public Roads, U.S. Department of Transportation.

As most recently estimated by the federal government, construction of the National Interstate System should be completed around 1975. In order that each mile of the eight longest and incomplete interstate highways in New Jersey will meet an immediate need of both the State and Federal Highway Systems, the department has placed most emphasis usually on construction of relatively short and more critical sections of these freeways rather than completion of any single route all in one period of time.

#### Practical Transportation Expansion

The department has already proven, both from a technical and a production standpoint, that it is qualified to face any transportation emergency if given adequate tools — money and personnel with which to meet citizens' needs. Mainly through increased federal-aid funds since 1956 and the start of the Interstate System, it has been given the opportunity of expanding its annual highway construction programs.

Prior to 1955, the State Highway Department's average annual construction program totaled \$25 million. From 1955 up to 1969, programs averaged \$140 million a year. The transportation bond issue, approved by a popular-vote margin of 63 percent in November, 1968, helped to jump the highway construction program to \$484 million for 1969. These are dramatic increases over a relatively short period of time. Even more important is the fact that current design and construction plans and conversion of these plans into actual construction contracts by the Transportation Department are keeping pace with all available funds.

#### The Transportation Master Plan of 1968

The Transportation Act of 1966 calls for the Commissioner of Transportation to "develop from time to time, revise and maintain a comprehensive plan for transportation development . . ."

In March 1968, the department published "A Master Plan for Transportation" which shows that overall construction needs total over \$3 billion for 20 years — similar to the forecast made in 1956 for 1975, despite all that has been done in the meantime.

For highways, this means around \$2.75 billion needed; and for public transportation, some \$375 million for the overall 20-year period.

For highways of top priority in the first 10 years, approximately \$1.5 billion are needed. For railroad capital improvements and construction in the first 5 to 6 years, \$325 million are recommended; and for other transit and aviation needs in the first 10 years, an additional \$50 million are suggested — which would use all of the \$375 million indicated for public transportation by the master plan in its 20-year period.

Implementing this important plan with sufficient funds soon became the largest and most pressing financial problem for the state in 1968. The federal government could not be expected to aid with enough matching funds, and the state could not appropriate adequately from current revenues, to cover such a great transportation program even if prorated over the 20 years. The best solution appeared to be through a bond issue tailored to the master plan's needs, which would provide the requisite supplemental millions of dollars.

#### The Transportation Bond Issue of 1968

The Transportation Department proposed that a \$1.2 billion bond issue be adopted.

Many key citizens proceeded at once to champion the bond-issue subject in a coordinated way throughout the state. In November 1968, the question of a transportation bond issue was on the ballot for referendum and was voted upon favorably.

In final form, this bond issue will provide \$440 million for highways and \$200 million for public transportation over a 10-year period. On January 7, 1969, the first sale of bonds by the state brought \$40 million and on August 19, 1969, the second sale netted \$37.5 million for allocation to highways and mass transportation. Periodically, according to the bond act and the requests of the Transportation Commissioner, the State Treasury Department will sponsor more bond sales.

These bonds do not relate to the three separate toll-road authorities which issue their own to construct and operate toll highways.

#### New Jersey Turnpike Authority

The New Jersey Turnpike Authority was established in 1948. The 132-mile turnpike was actually initiated by the State Highway Department following World War II. It was opened to traffic from the Delaware Memorial Bridge to Route 46 in Ridgefield Park, not far from the George Washington Bridge, in January, 1952. A 7-mile spur, from the vicinity of Newark Airport to the Holland Tunnel, was completed in 1956. A 6-mile spur, connecting the turnpike from near Bordentown to Florence and the Pennsylvania Turnpike, was also opened in 1956. Total cost of the main route and its spurs was \$446 million, covered by bond issues. Passenger tolls average 1.5 cents a mile and trucks 3 cents a mile on the basis of original rates.

#### New Jersey Highway Authority

In April, 1952, the legislature created the New Jersey Highway Authority to issue bonds and complete the proposed 164-mile Route 4 Parkway that had been started by the State Highway Department in 1947. Due to limited appropriations, the department had completed only 19 miles before this authority carried on.

The entire length of the originally planned main route, from Paramus to Cape May, was opened as the Garden State Parkway in July, 1955. A 9-mile extension from Paramus to the New York Thruway, near Suffern, New York, was opened in July, 1957. Total cost of the route was \$330 million. Passenger-car tolls average 1.6 cents a mile and truck tolls 3 cents a mile.

Each of the foregoing two authorities consists of members appointed by the governor, with the advice and consent of the senate, to serve a given term. The Transportation Department Commissioner, or his representative, serves as the governor's liaison and advisor and acts as coordinator to these authorities and to the following one also.

#### New Jersey Expressway Authority

A third separate roadbuilding authority was created February 19, 1962, when state legislation established the New Jersey Expressway Authority. The 5 authority members serve 5-year terms upon appointment by the governor with the advice and consent of the senate, also.

The legislation authorized construction of the Atlantic City Expressway from the southern terminus of Route 42 in Camden County southeasterly to Atlantic City, with a spur to Cape May to be added if and when deemed necessary. The major portion of the Expressway, from Route 42 to the Garden State Parkway, a distance of 37 miles, was opened in 1964. The final 7-mile portion into Atlantic City was opened in 1965. Tolls approximate 2 cents a mile for passenger cars and 2.8 cents for trucks.

#### New Jersey Continually Plans for the Future

Looking forward, New Jersey will have to further improve and expand its present transportation system beyond even some current advanced thinking.

Forecasts of population increase, of motor-vehicle registrations, and of miles traveled, for instance, predict with reasonable accuracy some of the major factors that must be dealt with and provided for in the future to help assure continuing adequate transportation in the state.

Such forecasting is part of all that the Transportation Department does in developing master plans for the state. These factors, together with labor and industry and other trends throughout the state, are considered against the existing transportation system.

It has been forecast conservatively that motor-vehicle registrations would increase from 3,440,648 in 1968 to 6,500,000 by 1990. It has been estimated, also, that vehicular travel in New Jersey would increase from 36 billion to around 72 billion vehicle-miles per year. The population of the state in 1967 was approximately 7,078,000. It has been forecast to reach 10,600,000 in 1990 — a rate of growth greater than any of the neighboring states of Delaware, Pennsylvania, New York and Connecticut.

To accommodate minimally this continuing upsurge in vehicular traffic, here are some projected necessary additions and improvements to the existing 2,010-mile State Highway System alone in approximately the next 20 years:

1. Over 800 miles of new freeways, or highways upgraded, extending into every county of the state.
2. More than 600 miles of the present system widened or converted into dual highways.
3. Grade separations, resurfacings and safety spot improvements on otherwise adequate roads to meet the latest standards.

In addition, New Jersey will have to improve and expand the related area of public transportation with its railroads, aeronautics and motor busses. Confronting the state here are such matters as: better railroad equipment and stations; the possible test of high-speed ground transportation; and better coordination of busses and their integration to the overall commuter situation.

None of the foregoing projected needs includes improvements at either the county or municipal level. In many instances, their related problems of the future may equal if not exceed those of the state. Typical examples of the inadequacies of present transportation facilities can be seen throughout many urban and industrial areas — rural ones too, such as near expanding recreational places, shopping centers and industrial parks.

It is only through the employment of all facilities and funds available to the Transportation Department and the experience and efforts of its trained personnel that New Jersey can best serve the interests of its citizens and fulfill its responsibility to highways and public transportation in their relationship to the economy of the state, its region and the nation — both currently, in the near future, and beyond.

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