Maine State Library
Digital Maine

Transportation Documents | Transportation

1970

A History of Maine Roads 1600-1970

Maine Department of Transportation

State Highway Commission

Follow this and additional works at: https://digitalmaine.com/mdot_docs

Recommended Citation
Maine Department of Transportation and State Highway Commission, "A History of Maine Roads 1600-1970" (1970). *Transportation Documents*. 7.
https://digitalmaine.com/mdot_docs/7

This Text is brought to you for free and open access by the Transportation at Digital Maine. It has been accepted for inclusion in Transportation Documents by an authorized administrator of Digital Maine. For more information, please contact statedocs@maine.gov.

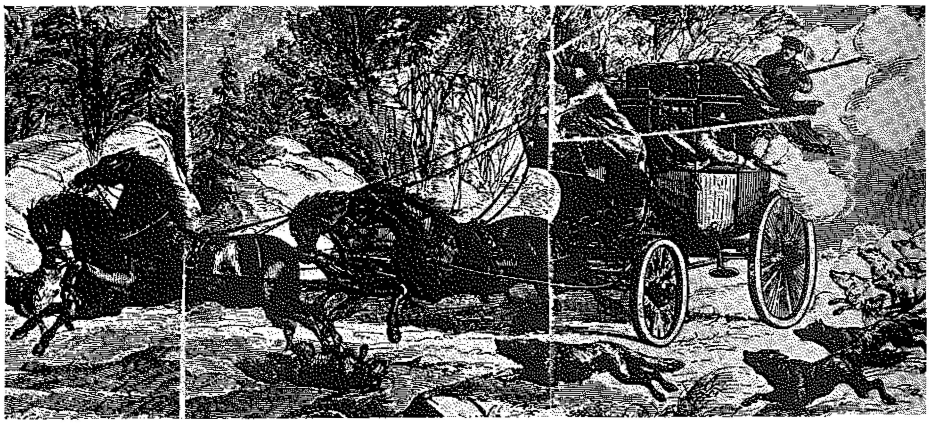
T 76.10:
Hi 673/970

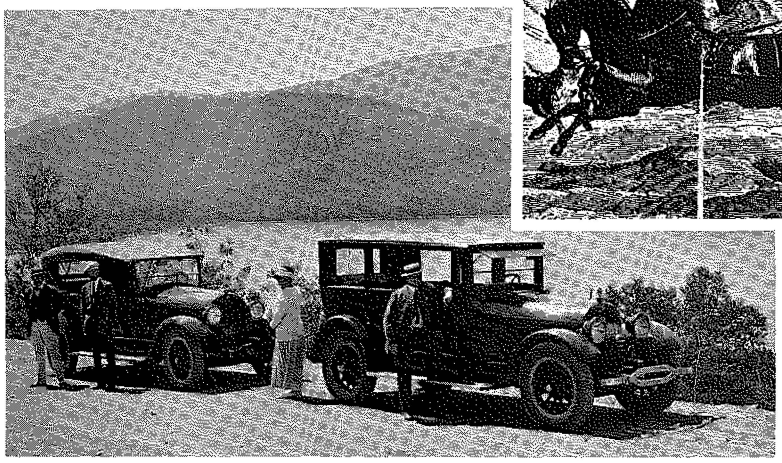
scanned January 2014 for
State of Maine
StateDocs
Digital Archive

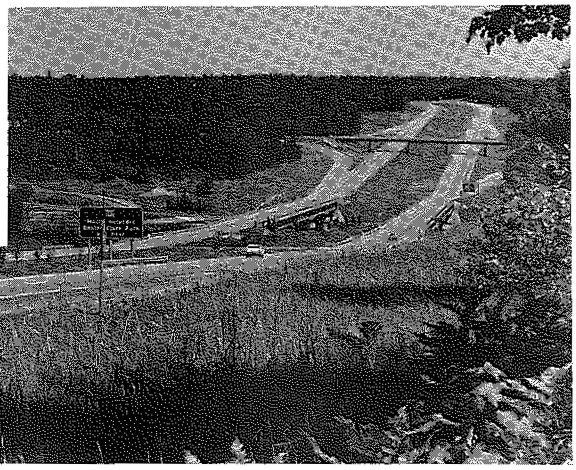
MAINE STATE LIBRARY
Me. Doc.T 76.10: Hi 673/970
Maine.
A history of Maine roads 1600-1970
00088955 9

A History of Maine Roads

1600-1970







Maine

State Highway Commission / Augusta, Maine

A HISTORY

OF

MAINE ROADS

State Highway Commission
Augusta, Maine
1970

History of Maine Roads 1600-1970

Glance at a modern map of Maine and you can easily trace the first transportation system in this northeastern corner of the nation. It is still there and in good repair, although less and less used for serious transportation purposes since the automobile rolled into the state in a cloud of dust and excitement at the turn of the century.

This first transportation network in the territory that became the State of Maine was composed of waterways - streams, rivers, ponds, lakes and the long tidal estuaries and bays along the deeply indented coast.

By using the waterways and carrying their canoes and small boats over the land that separated bodies of water, the Red Paint people, the later Indian, explorer, the pioneer and the settler could thread their way throughout the state.

With a ready-made system of transportation all around him, the early Mainer was not about to spend his energies building roads he didn't need. He followed the Indian trails along the banks of rivers and streams making them a little wider and a little deeper. He felled timber and cleared a rough road through the forest to early shipyards. But he had enough to do around the place without yearning to visit the next settlement. Likely as not the next settlement was up river or down and he went by boat.

When not used for any period of time most of these primitive roads faded back into the puckerbrush.

One type of early road left its mark because of its particular use. It was the "mastway." Maine's tall firs and spruce were a much-prized item as masts for the Royal Navy. Crews of men would cut the big trees and "swamp out" a road to the nearest waterway. In the Portland area modern streets follow early mastways to Fore River; and the village square at Freeport is so shaped because of the room needed to swing the big sticks as they were dragged to Mast Landing at the Harraseeket River.

TWO TRANSPORTATION FIRSTS

There are two footnotes in early American history related to transportation that took place in the region that became the Province of Maine. Both are concerned with community projects and they stand at the beginning of Maine's transportation story like signposts pointing the way the Mainer was to move around his region, his state and even around the world for almost three centuries after he appeared along the Indian trails and waterways of the region that became Maine.

First there was the building of the small sailing vessel Virginia by the Popham colonists in 1608 at the mouth of the Kennebec River. This is said to be the first ship built by English settlers in the New World. The small wooden sailing ship went up the Kennebec, down the coast to Jamestown, and even to England and back carrying cargoes from port to port.

The second public work also took place in the early 1600s. This was the construction of paved streets at Pemaquid overlooking the harbor. First a seasonal fishing station then a permanent settlement, according to reliable sources, Pemaquid was a flourishing port when Captain John Smith visited Monhegan in 1614 and already an established village when the Pilgrims landed in Massachusetts in 1620.

The paved streets of Pemaquid led from the wharves at the inner harbor back up the gentle slopes into the surrounding fields where the great catches of cod fish were dried on wooden stages. The paving was made up of flat stones from the nearby beach - large stones on the outside and smaller stones within. The traveled way was crowned, 11½ feet in width and flanked by stone gutters. Over these stone-paved streets the men who made Pemaquid a thriving fishing station in the 17th century drove their ox-drawn carts piled high with fish. In all, it is estimated that there must have been a half mile of paved streets through the settlement.

It may be, as some authorities have claimed, that the paved streets of Pemaquid were not only the first "made" roads in the region that became Maine, but the first in the nation.

But the paved streets did not grow inland toward other settlements, and after the village was sacked by Indians the streets literally sank out of sight. It is only in recent years that the stones have been uncovered along with the foundation stones of the village that once flourished so long ago.

EARLY ROADS

Roads that did develop pushed their way north from the southern gateway to the region at Kittery (Old Ketterie) from the governing mother colony of Massachusetts.

There is an early report of the Massachusetts commissioners riding into the district and getting no farther than Wells because of the condition of the roads. Thereupon they ordered the inhabitants of the Saco, Wells, Cape Porpoise area to "make sufficient roads within their town so that travelers could move from house to house" or suffer a fine - an edict that probably affected the people in that area like other pronouncements in the Crown's name.

As a result of the discomfort of the commissioners, however, stretches of a shore road were built along the Maine coast from Kittery extending northerly to Portland (then called Falmouth).

The first section of this early road was laid out in 1653 and called the "Kennebunk Road by the Sea." It was staked out to a definite width but nothing was done to improve it as a highway. Although bearing the euphonius name of the King's Highway it consisted of nothing more than two cart wheel ruts with a horse path in the middle. In his novel Arundel, Kenneth Roberts describes this early ancestor of Route 1 and 1-A as a series of bog holes where the horse could slip into mud up to its withers.

There were no bridges, and waterways along the coastline were forded where possible at low tide and crossed with a ferry as travel grew in volume.

This first King's Highway was the only means of communication between the Province of Maine and Massachusetts for more than a century. In the middle of the 18th century an upper King's Road was laid out connecting the thriving villages of York, Wells, Kennebunk and Saco.

When Benjamin Franklin was appointed Colonial Postmaster he established a weekly mail service east of Boston thereby giving the name of "Post Road" to the newly completed upper King's Highway. Large granite blocks were placed along the post roads radiating outward from Boston. In Maine the milestones were set along the early post road from Kittery to Portland in 1760.

Present day U.S. Route 1 and 1-A have absorbed sections of the old Post Road. But here and there where the old road is still on its own, the original name, King's Highway, is displayed - a genuine relic of the past.

THE STAGECOACH ARRIVES

Stagecoach lines began to make regular trips between Maine communities after the Revolution, and the first place they appeared was on the Post Road between Portland and Portsmouth. In 1787 the journey required three days.

First came the stage wagons - springless heavy wagons that went over the meandering ruts of the early roads in a cloud of dust or hubdeep in mud. The coaches that took their place were a refinement with springs or leather straps to absorb the bumps and an enclosed space for travelers. In 1825 a stage line running regular trips between Bangor and Portland made the dusty journey in 36 hours and charged $7.50.

Regular passenger service by stagecoach was inaugurated in 1818 from Portland to Boston. When Portland became a city in 1832 there were twelve stagecoach lines operating out of the community. The Portland-Boston stage was an express that left early in the morning and arrived in Boston that same night.

Two events hit the seagoing Mainer hard in the early 19th century and shifted his attention to roads as a means of transportation. First there was the Embargo Law of 1807 which forbad American ships to put to sea. Then came the War of 1812 and the British blockade.

With their ships out of commission and rotting at the wharves, businessmen turned to highway transportation.

But the roads got no better. The town fathers of settlements and the growing towns and cities could barely afford to build and maintain their local streets let alone improve the road to the neighboring community.

The roads between towns remained a wandering set of wheel ruts until here and there, in order to cross the worst stretches, companies were formed to build toll roads.

The period of toll roads - the turnpike era - spanned roughly the years from 1795 to 1850. When Maine became a state in 1820 it inherited from Massachusetts five operating turnpikes: The First Cumberland Turnpike across the West Scarborough marshes (bypassing Scottow's Hill); the Bath Bridge and Turnpike from the Bowdoin Pines east over the New Meadows River to the ferry; the Wiscasset and Augusta; Wiscasset to Day's Ferry; and the Camden Turnpike which bypassed an earlier road over Megunticook Mountain and provided a link between Lincolnville and the harbor at Camden.

Through the period of the stagecoach and the proliferation of stage lines, turnpikes and toll bridges, and even after the coming of the railroads, the most important means of transporting goods and people in Maine was still by water.

STEAMBOATS AND RAILROADS

The steam engine was invented in 1796 and its first successful use was in a boat, then construction machinery and finally the railroad.

Steamboats began regular calls to Maine ports on the coast and inland along

navigable rivers in the early 1800s. Competition between steamship lines grew so fierce that the price of the fare between Waterville and Boston went down to one dollar.

Water transportation to Portland reached its height in the 1850s with 246 sailing vessels and 12 steamship lines calling at the port regularly.

The coming of the railroads marked the end of the stagecoach lines and the turnpikes. One of the first railroads in New England began operations between Bangor and Old Town in 1836. In the years from 1842 to 1906 there were 31 railroad lines operating in the state.

In 1890 railroad mileage in the United States surpassed the mileage of surfaced highways.

At the same time that railroads and ships were becoming more sophisticated more reliable and more numerous, Maine roads were, if possible, getting worse. Lack of planning, little engineering and no regular maintenance resulted in a hodgepodge of dirt trails wandering from one town to the next over outcroppings of ledge, through fordable streams, by intermittent ferry, or by rickety wood pile toll bridge. Even in 1920 an early traveler by auto tells in an early guide book of crossing the Piscataqua River on the "quivering old wooden toll bridge." A new one, he adds, is under construction. The new one in 1920 is what we call today the old Memorial Bridge.

BETTER ROADS MOVEMENT

Near the end of the 19th century and the beginning of the 20th the situation was this: The toll roads had been out of business for some time. Local governments were unable to raise the revenue needed to build or maintain roads, and no federal assistance was available. Long distance travel went by railroad or steamboat; industry used railroads and waterways exclusively.

The farmer was mired in the mud of primitive dirt roads. He couldn't get his

produce over impassable roads to the railroad. In good weather railroad cars were overloaded, in bad weather they ran empty. Railroads began to have more than a passing interest in the plight of the farmer and farm to market roads.

Other forces were making themselves heard in the land. The League of American Wheelmen was formed in 1880 and launched a better roads movement on a national scale.

A guide to cycling in Maine published in 1891 under the auspices of the Maine Division of the League of American Wheelmen noted that roads in the state were not generally good "...the methods of road repair are faulty, and correct road building has never been regarded as a subject worthy of investigation." The guidebook referred to the nationwide cry for better roads: "...the matter of road making is now being agitated so strongly by the League of American Wheelmen it is hoped its influence will penetrate Maine, and perhaps the next generation will profit by it."

The guidebook's description of Maine roads near the turn of the century is matter-of-fact and unflattering: The bicyclist will find Maine roads made of sand, rocks and clay (that becomes glue when it rains) and roads that seem to select all the hills, and climb over them with "a persistency worthy of a better cause."

"Once in awhile in his journey through the state the wheelman will find a bit of good riding, a smooth surface, an easy grade beneath overhanging trees with perhaps a rushing river to keep him cheerful company. Then he will wonder why it cannot always be thus, and what the reason is for our poor highways."

The guidebook goes on to sketch the problem of road-building in Maine: "Roads cost money and Maine is not a wealthy state. The practice of allowing citizens to work out their taxes on the roads in their community is the worse system ever devised, because the men have no knowledge of road-building and spend their time in idle chatter. The making of the road happens when other business is slack and is not necessarily the best time of the year to construct a road."

The guidebook writer concludes that our roads should be built by men skilled in the business that have studied engineering and the various kinds of road building including a knowledge of soils mechanics and maintenance.

The American wheelmen were vocal and persistent and their influence extended into legislatures in every state.

Other events were also hurrying the development of good roads.

Rural Free Delivery was authorized by an Act of Congress in 1893 giving the good roads movement impetus a tremendous push because a prerequisite for the service was a gravel or macadam road.

THE AUTOMOBILE

Then in 1903, J. Frank Duryea appeared at the wheel of the first gasoline engine powered automobile on the streets of Springfield, Massachusetts.

In 1895 there were four autos registered in the United States. Five years later there were 8,000 registered. In 1914 registrations shot up to 200,000. There was even enough enthusiam and capital available in 1909 to build what became an institution in automobiledom - the Indianapolis Speedway.

In Maine in 1905 there were 22 car dealers, 77 motorcycles, 715 automobiles and 898 licensed operators. These were the totals after the first year of operation of the Motor Vehicle Division which had been voted into being the previous year by Legislature.

A favorite story in the division about those early days is that at one time there were just two cars registered in Aroostook County. One day, against all odds, they arrived in Mars Hill at the corner of Main Street and the road to Presque Isle and collided.

Maine vehicle registrations rose from the 1905 figure to 23,374 passenger cars and 1,098 trucks in 1915. Ten years later the totals had increased to 115,229 cars and 23,794 trucks.

In 1903 a pair of events cast long shadows into the future: The first transcontinental auto trip from San Francisco to New York City (6,000 miles, including detours, in 44 days) took place; the second milestone was the incorporation of Henry Ford's motor company marking the beginning of an economical, mass-produced auto for everyone.

STATE ROADS

It was not until 1901 when Governor Hill in his inaugural address called attention to the need of a state highway "system" and state expenditure of money that an official state recognition of such a system appeared.

This was the first official designation of a "state road," and the law read:

> Upon the request of the municipal officers of any town, the county commissioners of the county wherein said town is located, shall designate that highway running through said town which in their judgment is the main thoroughfare, and said highway shall be known as a state road.

It might be noted that in reality the municipal officers chose the road, but the county commissioners declared it. It was further provided for the state's granting money up to $100 to each town for use on their roads. An appropriation of $15,000 was made for that purpose.

The towns received the aid in order of their applications - based on nothing else. They were to spend $100 on the part of the road in their town in order to qualify for aid, and the state reimbursed them. The county commissioners inspected the work and certified to the Governor and Council as to whether the money was properly spent.

Twelve towns took advantage of this appropriation by Legislature and built 2.5 miles of road at a cost of $3,025.30.

FIRST HIGHWAY COMMISSIONER

The appropriation for state roads was raised to $40,000 in 1903; and in 1905 the office of Commissioner of Highways was created. His duties were to collect information on the best means of constructing highways and maintaining them and send it out to the towns. He had no duties in regard to designating or building any state roads.

Paul D. Sargent, who was chosen to be Maine's first Commissioner of Highways, was an engineering graduate of the University of Maine and a native of Machias.

Sargent's recurring theme in his well-written reports to the legislature each year from 1905 to 1911 was "uniformity." As a good engineer he knew the value of accurate records, of following standards already tested and agreed upon, of building "permanent" roads - not just making temporary repairs - and then maintaining this facility on a regular basis.

In Sargent's 1905 report - the first and most voluminous - he suggested ways of improving country roads: cutting bushes, straightening, widening, cutting down hills, the construction of sand roads, clay roads. He inserted photos in the report of snow rollers, diagrams of rock crushers and road rollers.

In discussing the need of regular road maintenance at the Central Maine Fair Association in Waterville in the summer of 1907 Sargent told his audience they would be much disturbed if they should find that the railroads only repaired their roadbeds when forced to by washout or accident.

"Let us hope, "he said," that the day is not far distant when trained men will have charge of road work and it will be done according to some systematic plan, in place of our present method of working a section here and a section there when we can find nothing better to do and letting the most of it go uncared for practically all of the time."

Sargent reported in 1905 there was a total of 25,530 miles of all classes of roads and streets in the state. There were 1,353 miles of village and city streets;

and the rest country roads. Of this mileage there were 2,238 miles of gravel roads, 22 miles of granite block pavement, 65 miles of macadam streets, and the rest of the mileage, almost 22,000 miles, just plain dirt.

Properly, Sargent focused his attention on the dirt roads, and discussed methods of road construction with a minimum of equipment. "A road, like every other piece of human work, is good or bad just in proportion to the amount of skill and ingenuity that has been used in its construction and maintenance."

STATE HIGHWAY DEPARTMENT

A State Highway Department was created in 1907 by the 73rd Legislature, which body also passed a state aid law resembling the formula in use today whereby apportionments are based on the valuation of cities and towns. Four years later laws were passed requiring auto registrations and drivers license fees, the receipts to be used for the improvement of state highways. In 1913 this revenue was pledged to finance the first highway bond issue of $2 million which had been voted by the people the year before.

In 1909 Commissioner Sargent said, "There is a growing sentiment in many sections of the state that the future development of our tourist and summer resort business depends largely upon the development of our system of trunk line highways."

His report to the legislature noted that roads that once lasted for years under horse-drawn traffic are fast deteriorating under automobile traffic. People complained of the dust raised by the "swiftly moving machines" which could be a positive injury to their property.

Road engineers and chemists and engineers employed by commercial firms were studying methods for preventing the rapid wear of these roads and for supressing dust. Tar and asphalt were the materials which seemed feasible to use.

"Realizing," said Sargent," that the automobile has come to stay and that the State of Maine will soon be called upon to meet the consequent road problems, we have, during the present year, built bituminous macadam roads in Hallowell, Lewiston, Madison, Portland, Richmond and Westbrook."

STATE HIGHWAY COMMISSION

In 1913 Maine took a giant step forward in the history of its highways by creating a three-man Highway Commission which took over the records and equipment of the existing State Highway Department.

This legislative action put the highways of the state under the guidance of a central coordinating agency with authority to build and maintain a highway "system."

The brand new State Highway Commission was voted into being by the 76th Legislature and charged with building a system of "connected main highways throughout the state."

Governor William T. Haines appointed the three members and the Council approved the appointments on July 19, 1913. Members were: Lyman H. Nelson of Portland, Chairman; and members Philip J. Deering of Portland and William M. Ayer of Oakland.

Paul D. Sargent, the first Commissioner of Highways for the state was chosen by the Commission as its Chief Engineer. He was to serve in that capacity until his retirement in 1928.

This first Highway Commission employed twelve persons: a chief engineer, five assistant engineers, four stenographers, an accountant and a bookkeeper. The entire Department was housed on the basement floor of the Capitol in Augusta. By the early 1920s office space was so cramped that hearing rooms and cloak rooms were being used as drafting rooms when the legislature was not in session.

The new Commission began planning and surveying a state highway system immediately. The highways of the state were divided into three general classes: state highways, state-aid highways and third-class highways, known today as town ways.

In 1914 the system totaled 1,342 miles.

The need for an interconnected network of roads in Maine in 1913 becomes more obvious when we look at early road maps. In the Department's report of 1908 a map was included which showed the state roads at that time. Since the short, separate curving sections of highway were colored red, someone said it looked like a bunch of angleworms. The name stuck and the map became known as the "angleworm map."

This map is an apt symbol of the condition the Commission was created to remedy. Since construction prior to 1913 had been in the hands of the towns and cities with the emphasis on local roads, the sections of roads served local interests and were not built to connect with those of a neighboring community. Neither were they of similar design or construction.

The second Commission report stated that, "The Commission has endeavored in the determining of the location of state highways to constantly bear in mind that these routes shall serve the largest number of people possible, and at the same time develop the farming, manufacturing and summer resort resources of the state. The Commission further realizes that there are two distinct classes of interests to serve, namely: The local inhabitant and the interstate traveler..."

In the early years of the Highway Commission many of the elements that go to make up our present State Highway Department were either planned or put into effect: Hearings were held prior to construction so that special knowledge about the community, which might affect the location or design of the road, could be taken into account. Projects costing over a certain amount were advertised for competitive bidding to accomplish the work as economically as possible. The delicate problem of acquiring right of way was studied and written into law. A research and testing laboratory was established in cooperation with the University of Maine at Orono.

PATROL MAINTENANCE

The Commission felt, stated the 1915 report, that one of the wisest acts of the 77th Legislature was the provision for patrol maintenance on state and state aid highways including the maintenance of unimproved, as well as, improved sections. The law became operative in July but it wasn't feasible to put it into practice until the spring of 1916.

As a kind of trial run of the new law the Commission cooperated with the town of Gray during the season of 1915 employing and paying jointly for the services of two patrolmen who worked on twelve miles of road. Although the municipal officers of the town looked askance at this method of caring for roads when it was started, they were loud in their praise of the results obtained at the end of the season. The general traveling public who had occasion to use the roads which were patrolled were also pleased with the results.

The commissioners believed that this was the greatest step for road improvement that had ever been undertaken in the state and were confident that with the cooperation of the municipal officers and the public a full measure of satisfaction would be realized for the expenditures made.

During 1916 the first attempt at patrol maintenance on any extensive scale under the new law was undertaken - 3,379 miles of road located in 423 towns were under constant daily care of 373 patrolmen. Patrol work was started about April 15 and continued until about November 1. Substantially $275,000 was expended on this work.

BRIDGE LAW

State and county aid for bridges became law in 1915 but there was no appropriation to carry out the work. The Commission contemplated organizing a bridge division under the supervision of a structural engineer who would be qualified to design and superintend the construction of all classes of highway structures.

The General Bridge Law provided for state and county assistance in the construction of bridges on main thoroughfares. "The law," said the Commission Report, "will put bridge building on state and state aid highways, at least, on a thoroughly business-like basis and will give the state good substantial bridges properly designed and built."

In 1917 the Commission reported that after the first year of operation of the new bridge law, from the number of applications received and the bridges constructed, it seemed to be a wise piece of legislation.

Methods of financing the state's share of bridge construction have varied. For the first three years in which work was done under the Bridge Act of 1915, an annual appropriation of $100,000 was provided. In 1919, because of increased demand, income from bond issues was apportioned for this work, and this method of financing continued until 1937. Since that date funds have been allotted from the General Highway Fund.

FEDERAL AID

The most important development in connection with the work of the Highway Commission during 1917 was the completion of arrangements with the federal government for receiving federal aid.

By Act of Congress, approved July 11, 1916, the State of Maine could draw federal aid for highways to the amount of $731,250 during the five year period of 1916-1920, beginning with $48,750 for 1916.

The federal funds could be secured only when matched by a state contribution. It became necessary to find a source of income not only to match them but also to provide for additional needs resulting from an expansion in the highway programs of the state, counties, cities and towns.

HIGHWAY FINANCES

At this point it might be well to review the financial resources of the State Highway Department, and to note the changes in the kinds of major revenues. In an attempt to make the picture clear as possible we will go back in time as well as forward:

Highway-user taxes began in Maine in 1905 with the first law providing for the registration of all motor vehicles and the licensing of operators, but these revenues were not specifically set aside for highway purposes until 1911.

Along with the evolution of highway-user taxes, property taxes for highway purposes underwent an on-again, off-again existence. First imposed at one third of a mill in 1907, it was increased to three-fourths of a mill in 1909. This source of funds was stricken out in 1911 and replaced with an annual appropriation of $250,000 - increased to $300,000 in 1913.

Demands for highway funds increased and with the acceptance of federal aid by the legislature in 1917, new sources of revenue had to be found to match the federal allotments.

The Mill Tax Highway Fund was the result of this added pressure. The sum of $200,000 of the proceeds of this one mill tax on the property valuation of the state was added to the $300,000 appropriated for state-aid construction and the two sums were called the State Aid Highway Fund. The balance of receipts was known as the State Highway Fund and was used exclusively for the construction of state highways, after making maximum use of federal funds through matching. The mill tax was suspended during the Depression and finally repealed in 1937.

Adequate finances for state highway work in the first years of federal grants to Maine were provided for by an amendment to the constitution passed at the special election in September 1919 authorizing the issue of $8 million of new highway and bridge bonds. The legislature in special session in November 1919 authorized the issue of $2 million worth of these bonds for state highway construction work in 1920.

In 1921 the use of federal aid was allotted to a limited, connected system of principal roads which later became the federal-aid primary highway system. In 1944 provision was made for the federal-aid secondary system consisting of principal farm to market and feeder roads. Urban extensions of the primary and secondary systems were also authorized in 1944.

The general trend of legislative policy over the years has been to gradually transfer responsibility for highway costs from the property owner to the highway user. Taxes on gasoline were first imposed in 1923 at the rate of one cent per gallon. This was increased to 3 cents in 1925, 4 cents in 1927, 6 cents in 1947, 7 cents in 1955 and 8 cents in 1969.

By 1929 six sources of income were employed for the operation of the State Highway Department, often with complicated formulae governing the distribution of their proceeds. The six sources were: Registration and license fees, $300,000 appropriation, Mill Tax Fund, gasoline tax, bonds, federal aid.

The public laws of 1931 established a General Highway Fund to clear up the welter of confusion and to make the use of highway revenue more efficient. The Act provided "funds for the construction of state and third class highways, for the maintenance of state and state aid highways and interstate, intrastate, and international bridges, and for other items of expenditure.... This fund shall include all fees received from the registration of motor vehicles and licensing of operators, the receipts from the Mill Tax Highway Fund, the receipts from the tax on gasoline.... The appropriation of $300,000... all fines, forfeitures, and costs accruing to the state, and all sums received... for permits to open highways or from other sources the disposition of which is not otherwise designated by law."

The General Highway Fund was to be utilized first to meet bond interest and retirement charges and then for various specific purposes. Apportionments for administration and for maintenance as the State Highway Commission should

direct.

In 1933, as the State of Maine felt the full effect of the Depression, the sources of highway income were decreased radically by suspension of the mill tax and the $300,000 appropriation. The practical effect of this step was that only revenue coming from highway users was available for the construction and maintenance of state highways and bridges. Property owners, who benefited from state highways did not contribute directly toward their construction and maintenance. Highway expenditures were, of course, cut along with receipts.

The law of 1935 again suspended the mill tax and the $300,000 appropriation, this time until July 1, 1937. In addition, it provided that the General Highway Fund could be used to finance the construction of state highways, a provision not included in the 1931 law. The only significant increase in highway appropriations was $700,000 to match federal aid funds.

By action of legislature in 1933 the sources of state highway revenues were limited to taxes on highway users. In 1936, to ensure that these revenues were used solely for highway purposes, the people of Maine by referendum vote adopted a directly initiated bill which provided that "neither the General Highway Fund, nor any fund derived from direct taxation imposed for highway construction, bridge construction, or the improvement and maintenance thereof, shall be diverted or expended, either temporarily or permanently, for any other purpose then set forth in this act."

The law of 1931 was repealed in 1937, and a new law enacted. The mill tax and the $300,000 appropriation, which had been suspended in 1933, were finally repealed. Some of the minor appropriations were increased slightly. The law of 1937 further authorized the State Highway Commission to accept federal funds for the improvement of secondary or feeder roads. In 1944 a constitutional amendment became effective which prohibited the diversion of any highway funds.

WORLD WAR I

In 1918, highway work in common with all other construction work suffered because of the lack of sufficient labor. America was involved in World War I and regulations prescribed by the government in connection with the purchase and shipping of materials necessary for the construction of roads and bridges, made the conduct of the work of the Department extremely difficult.

At this time the federal government through the War Department urged the complete construction of the trunk line highway along the Maine coast from Portsmouth to Portland, Brunswick, Rockland, Bangor, Bar Harbor, Machias and Calais. The Department also asked that the interior route from Brunswick to Augusta, Waterville, and Bangor be completed as soon as possible. Highway work in the Pine Tree State was limited to these two routes.

In February 1919, Congress directed the Secretary of War to distribute road-building equipment to the state highway departments. Included, were motor vehicles, all kinds of road machinery, tools and equipment, and also engineering instruments and supplies, no longer needed by the War Department.

The basis of distribution of this bonanza of equipment was the same as for distributing federal appropriations to the states. Maine's share of this surplus equipment was practically one percent of the total. An inventory showed that the Commission was in possession of equipment valued at $1 million. To get this new fleet of highway machinery under cover and to provide a place for its repair and maintenance it was decided to build a garage and machine shop. The building was constructed at the city gravel pit lot in Augusta handy to the State House. The garage was completed in 1921.

FIRST ROUTE MARKERS

During 1919 the Commission cooperated with the Maine Automobile Association in carrying on the work of marking state highway routes with distinctive color

bands. The work was initiated by the AAA and proved very popular with motorists traveling unfamiliar sections of the state before the days of route markers. At that time it was the purpose of the Commission to complete the marking of all state highways by color bands.

The Commission at the same time erected along many miles of state highway danger signs warning users of the highway of dangerous curves, intersecting roads and right angle corners. This work was continued until substantially all of the dangerous points had been signed.

The first numbered route markers along Maine highways appeared in the summer of 1925. The new signs were 11 by 15 inches painted yellow with black numerals and borders.

To make the new route numbers useful to the motorist the Commission issued in 1925 the first official Maine road map for general distribution. The relatively simple black and white map measuring 17 by 25 inches was a modest beginning when compared to today's colorful edition, but it represented a giant step forward for the motorist in Maine who before that time had guessed his way from one part of the state to another.

At about the same time that the Highway Commission crews were erecting the new route markers along Maine highways a behind-the-scenes event was taking place that was to standardize route markers and guide signs throughout the United States and create a new system of route numbers.

This U.S. system of numbers was adopted officially in 1926 and was for the purpose of facilitating travel on the main lines between states over the shortest routes and the best roads. For all practical purposes it is still in effect.

The U.S. system did not absorb or supplant the state numbered routes, nor does it have any connection with federal control or the designation of federal funds for road construction.

TRAFFIC COUNTS

In the early 1920s the Commission began to look upon the counting of traffic as not only a means of finding out which roads were of the most importance to the public but as an indication of the type of surface which must be provided at the locations under consideration.

To make the counts the Department hired people living near the station where the counts were to be made. For example, one report reveals that in 1924 a little old lady in Kennebunk was persuaded, for a modest sum, to sit in her dormer window for four hours keeping track of the number of cars, trucks and horse drawn vehicles passing her home on what is now U.S. Route 1.

Today the Commission counts traffic continuously at 34 locations and every year makes additional counts in section by section of the state with portable recorders. The entire state is covered every five years. The Commission knows the traffic count on most roads in the state more than 0.5 mile in length.

Traffic counts are related to other information gathered by Commission personnel such as turning movements, type of vehicle, and information recorded in roadside interviews with drivers, so that Commission engineers may know as much as possible about the traffic using our highways. Only then can they plan and design the best facilities to do the job.

SNOW AND ICE CONTROL

Probably one of the major changes in Maine's highway transportation picture has been the gradual evolution of an efficient snow and ice control program.

It wasn't too long ago - before the invention of modern snow-fighting equipment and the use of de-icing chemicals - that most motorists jacked up the family car after the first snow fall and impatiently waited for the season to end.

Serious interest in keeping Maine roads open all winter long began in the 1920s. During the winter of 1925-26 an effort was made to keep the highway open from Kittery to Bangor. At a preliminary meeting in December a committee was appointed to organize the work and to solicit funds where municipalities were not prepared to undertake the work.

The Commission agreed to attempt to keep open the section of road on the west bank of the Kennebec River between Gardiner and Augusta; and the road on the east bank of the river from Augusta to Vassalboro and the Winslow Bridge.

Gradually the State Highway Commission assumed more and more responsibility and more mileage on the state highway system. As the Department's fleet of snow-fighting equipment grew, a procedure was worked out to make the highways safe for Maine motorists.

In the early 1950s salt began to be used to melt away the snow and ice on a cleared highway. Salt mixed with sand made icy highways skid resistant, and salt in the sand kept the stockpiles of de-icing materials from freezing solid.

In the winter of 1953-54 a night patrol took to the road relying heavily on radio to keep watch on the condition of Maine highways. The patrol has been on the road each winter since its inception.

PLANNING ACTIVITIES

An important new activity of the Commission was a "planning survey." A 1937 law provided for a survey of Maine highways to consist of data on traffic, road conditions, road use, economic and financial surveys and such other surveys and studies as may be advisable to make available complete statistics on the status of highways and highway traffic. This information was to be used as a basis for formulating a rational highway program of road building for the entire state.

The result of these activities was the formation of the Planning Division with a staff engaged in the compilation of road inventory tables, preparing traffic tables

and making financial studies, performing grade crossing studies, mapping, operating automatic traffic recorders, making statistical reports on various aspects of the Department from planning through design, construction and maintenance. The division also began the preparation of a state road map to be issued on an annual basis.

Under federal provisions, one and one-half percent of certain federal funds apportioned to Maine could be applied to the highway planning surveys.

In 1938 a Traffic Division was formed responsible for the design and installation of traffic signs, the painting of pavement markings, surveys of hazardous locations, and the handling of traffic complaints and special traffic studies. The division was headed up by a trained traffic engineer.

In 1940 the Commission established an Accounting Division for closer control over the funds, financial transactions and records of the Department.

WORLD WAR II

The 1940s meant World War II, an upheaval that affected all activities in state government. To the Highway Commission it meant the cutting back of all phases of its many new programs. Gasoline was rationed, materials and equipment were diverted to wartime use, employees went into services or needed industries. Department activities slowed to a walk.

The period immediately following the war marked almost a new era in highway activities. The federal government, as early as 1944, suggested that highway departments make explicit plans for new work to make up for lost time, and authorized 1.5 billion dollars for highway construction nationally in the three years following the end of the war.

Although men and materials were still not available, the Maine State Highway Commission began immediately in 1946 to repair the ravages of weather and wear on the state's highways. In 1948 the program really got rolling.

THE MAINE TURNPIKE

In 1947 another "turnpike era" began in Maine, only this time on a king-size scale, when the Maine Turnpike Authority opened 45 miles of controlled access four-lane highway from Kittery to Portland.

The toll expressway was built in answer to the problem of traffic congestion along U.S. Route 1 entering the state from the south. The Highway Commission was concerned over the inadequate condition of this southerly entrance to the state, but it was beyond the traditional financing measures of the Department to build 45 miles of new high-cost highway to relieve U.S. Route 1.

The result of this dilemma was the creation of the Maine Turnpike Authority by the legislature in 1941. The Authority consists of four members appointed by the Governor with the advice and consent of the executive council, and the chairman of the State Highway Commission as a member ex officio.

The MTA is authorized and empowered to "construct, operate and maintain a turnpike at such location as shall be approved by the State Highway Commission... and to issue turnpike revenue bonds payable solely from tolls to pay the cost of such construction."

The Act provides that the bonds of the Authority shall not constitute a debt of the State of Maine or of any agency or political subdivision, and shall be payable solely from revenue of the Turnpike.

The Act further provides that when all bonds and interest shall have been paid or provision made for the same, the Turnpike shall become the property of the State of Maine and the Authority shall be dissolved. The Turnpike shall then be operated and maintained by the State Highway Commission.

The Kittery-Portland section of the Maine Turnpike was opened to traffic on December 13, 1947. As soon as the new toll road was opened, interest began to develop in extending the facility to Augusta.

The second leg of the Turnpike was put into operation exactly eight years later on December 13, 1955. This made the total length of the toll road 106 miles from the southern gateway of the state to its capital.

RIGHT OF WAY

It is part of our legal traditions that government - federal, state and municipal - has the right to acquire property it needs to provide public services. Without this guarantee we might not be able to construct new schools, water systems or roads to serve the public interest. It is also part of our law that no private property be acquired for public use without just compensation.

In 1913 the Commission was given the right by law to acquire private property by eminent domain, a method that has several advantages to the state and the owner. First of all it eliminates the necessity for individual deeds, releases or discharge of mortgages, cancellation of leases and other miscellaneous documents. Secondly, it reduces the administrative expense resulting in a considerable saving to the taxpayer.

In 1961 a Land Damage Board was created by legislature to provide an impartial board to make a determination of the fair market value of the damages due for the taking of property by eminent domain under a procedure which would permit any interested party to present his case and have his rights fully protected without the necessity for retaining professional assistance. The Board is an independent agency entirely separate from the Highway Commission.

DIVISION OFFICES

With the beginning of year-around maintenance program in the late 1920s the Commission divided the state into districts with supervisors in charge of each area.

To further extend the services of the State Highway Commission it was decided to establish division offices throughout the state. The first office was

was opened in Presque Isle in 1948. In 1951 offices were established at six other locations. The seven offices are now located in Presque Isle, Ellsworth, Bangor, Dixfield, Fairfield, Rockland and Scarborough.

Each division office is a State Highway Department in miniature with an experienced administrative engineer in charge, and an assistant division engineer. There are engineering personnel assigned to the office who design and supervise construction, supervisors who patrol the area and directly oversee road construction and maintenance forces, and clerks who handle pavement opening and overload permits and other routine office matters.

Shortly after the division offices opened their doors a radio network was installed linking all division offices, headquarters in Augusta and mobile equipment. Radio communication between Department engineers and personnel makes it possible to save valuable time in carrying out the daily tasks of the Department.

CHAIRMAN FULL-TIME POSITION

In 1953 the Maine Legislature passed a law which made the chairmanship of the Highway Commission a full-time chief administrative position with a seven-year term. The first appointee was David H. Stevens, a civil engineering graduate of the University of Maine who had been town manager of three Maine communities, state tax assessor and commissioner of Health and Welfare. He has been twice re-appointed.

The State Highway Department has been lucky in attracting and holding a nucleus of highly skilled, dedicated professional engineers who have become knowledgeable veterans in highway matters in their years of service. These men have also been fortunate in the caliber of the men under them who carry out their policies and in the conscientious devotion to duty of supervisors and foremen in the field.

Two Highway Commission engineers have been honored by Legislature in recent years by having bridges named in their memory. The twin Interstate 95 structures over the Penobscot River at Medway are the Vaughan M. Daggett Memorial Bridges,

honoring the late chief engineer for the Commission who served in this top engineering post from 1955 to 1966. He had been with the Department in an engineering capacity since graduating from the University of Maine in 1930.

The graceful bridge over the Sasanoa River just downstream from the Carlton Bridge between Bath and Woolwich has been named the Max L. Wilder Memorial Bridge, in memory of the late chief of the Commission's bridge division. Mr. Wilder served in that capacity from 1928 to 1962.

It is not at all unique when men retire from the State Highway Department to learn that they have served the Commission 30 to 40 years.

ENGINEERING TOOLS AND TECHNIQUES

In 1913 the Highway Commission engineer built and maintained Maine highways with very little equipment. The image of the highway engineer standing behind a surveyer's transit was an apt symbol of our early pioneering state highway department activities. Give this symbolic engineer a slide rule and that would have been just about the extent of his technical aids.

Most of the major highway engineering changes have taken place during the last two decades and have revolutionized highway design, construction and maintenance.

In most instances the modern engineering tools that made their appearance were the result of inventions during World War II - photogrammetry, seimic surveying, the nucelar density-moisture gauge.

Since 1961 the Commission has been using digital computers and data processing systems to aid the engineer in his work, and to help handle the tremendous volume of accounting work.

Computations that once took days to work out by hand can now be handled in a matter of hours. For example, the first engineering problem fed into the Department's original computer asked for the grade line on 18 miles of expressway.

This is the kind of task that would typically take an engineer about three days to work out; the machine gave back the answers requested in about an hour and a half. The Commission's new third generation computer solves such problems in significantly less time.

It's this lightening calculator aspect of the computer that makes it a valuable tool in highway engineering.

In recent years more modern computer systems have made it possible for the accounting division to use their capabilities in keeping inventories of the vast number of items the Commission must stock for its daily tasks.

ENGINEERING PIONEERS

The Maine State Highway Commission was a pioneer in at least two aspects of highway design and construction in the 1960s.

A long-range test project designed by Commission engineers was set up on U.S. Route 1-A in Hampden involving the use of insulating foam plastic sheets in the roadbed to control frost heaves. Enough data was collected and analyzed to warrant the use of the material in other problem areas in the state. One use was in the shady areas of highways under structures where spring thawing is delayed, causing a hump in the pavement.

The bridge engineers of the State Highway Department have been pioneers in the use of some of the most modern features of bridge design, producing structures that are economical as well as aesthetically pleasing.

Maine's Highway Commission was the first such agency in the East to have a major bridge of welded design using continuous, composite construction approved by the U.S. Bureau of Public Roads.

Commission bridge design engineers have found that savings, when welded designs are used over riveted structures, can run into thousands of dollars on a major bridge.

THE INTERSTATE PROGRAM

In 1956 the most ambitious federal-state program of highway building ever conceived was allocated enough funds to allow the states to begin building the National Interstate and Defense Highway System. Consisting of 42,500 miles of expressways, it is being constructed on the basis of 90 percent of the costs being borne by the federal government and 10 percent by the states.

The Interstate Highway is planned to accommodate the volume of traffic forecast for twenty years hence and is located so as to connect the principal metropolitan areas, cities, and industrial centers. The system is expected to carry better than 20 percent of the nation's total traffic load, although it will constitute only 1.2 percent of the total U.S. road mileage.

Maine, situated as it is in the northeastern corner of the nation, will be at the northerly end of the longest north-south route of the Interstate - I-95. The Pine Tree State's portion will be approximately 312 miles in length reaching from Kittery, at the southern gateway to the state, northerly to the Canadian border at Houlton.

The opening in November 1967 of the longest single stretch of expressway built to that date in Maine - the 41-mile section of I-95 between Medway and Oakfield - marked the eighth consecutive year that the Highway Commission had placed in service portions of the state's Interstate System.

The first link in the Maine system was the 9 miles of I-95 from Freeport to Brunswick, opened to traffic in November 1957. Attention was then turned to the line of the expressway north of Augusta to Waterville, Fairfield, Pittsfield, Bangor, Howland, Medway, Island Falls, Oakfield, and finally Houlton at the Canadian border.

Closing the Medway-Oakfield gap made it possible for the motorist in Maine to travel through the state on a continuous line of expressways from Kittery to the Canadian border by using sections of Interstate completed by the Highway

Commission and the Maine Turnpike.

The Medway-Oakfield opening marked the completion, for the time being, of the present Interstate construction program in the northerly half of the state. The Federal Aid Highway Act of 1966 calls for four-laning the present two-lane sections of I-95 between Old Town and Houlton, and this construction will be scheduled by the Commission as rapidly as funds become available.

At the beginning of the new decade in 1970, Interstate construction in Maine was concentrated in the Greater Portland area, Kittery-Portsmouth and Brunswick-Topsham.

Two portions of Maine's Interstate System have been cited by national panels of experts for scenic qualities.

In 1961 shortly after being opened to traffic the 24-mile stretch of I-95 between Augusta and Fairfield was chosen in a national contest as "America's most scenic highway." The judges in making the award praised the Maine highway for the imaginative way the road had been "designed into the landscape" to capitalize on the area's natural beauty.

The scenic highway from the first was planned to be more than just another modern highway. Commission design engineers and Chairman David H. Stevens thought the "Interstate route in tourist-conscious Maine should be a pleasure to drive as well as an efficient conveyor." One Department engineer walked the section a dozen times to fix a route that would blend best with the landscape and give motorists the most to see. The roadsides and median were left as natural as possible and the Department's landscape engineer directed a program of "selective thinning" to accent the beauty of the birch groves and spruce forests along the way.

These same features were applied to the sections of expressway designed and built north of the Augusta-Fairfield section. Four years later in 1965 the section of I-95 between Bangor and Newport was cited in the same national contest from more than 200 entries across the country.

To achieve prize-winning highways, Commission engineers study the terrain most carefully before picking a route that will take advantage of the best scenery and topography. As another example of this concern, the line of the Interstate in northern Maine runs on high land overlooking Salmon Stream Lake and, in the distance to the west, Mount Katahdin.

It would have been possible to place this route at a lower level, but because the particular location was selected, motorists are treated to a memorable view of one of Maine's more beautiful wilderness areas.

ROADSIDE BEAUTY

Aesthetics is always part of the modern highway engineer's concern as he chooses the best route, settles problems of design and studies details of safety.

Every corner of the state has its individual character and good highway locations do not detract from this uniqueness but capitalize on it. The highway may incorporate natural land features including rock outcroppings, streams, rivers, valleys and ridges.

When possible the natural vegetation is retained. Unsightly growth is thinned out and only the healthy trees and shrubs left. Blowdown and scrub are cleared away and certain areas opened to create a scenic vista.

When natural growth cannot be thinned and retained - at interchanges or on the slopes of large cuts or embankments - trees and shrubs are planted to enhance areas that would otherwise be barren. Such plantings also reduce maintenance costs since mowing vast areas of grass is expensive. They also decrease head-light glare across the median between opposing lines of traffic, and in some instances act as living snow fences.

To further provide for the safety, comfort and enjoyment of the motorists, rest areas and scenic turnouts are provided. The first roadside rest area was built by the Commission in the early 1930s. It was felt that Department

personnel should locate and build the areas because motorists were picking their own stopping places with at times no regard for traffic. With the lack of housekeeping and the increase in the volume of vacationing motorists these informal spots soon grew seedy and dangerous. Something had to be done to provide safe, off-the-road parking and other conveniences for the roadside picnicker.

In addition to the large rest areas on the Interstate, the Commission operates nearly 200 other areas on the regular state and state-aid highway system. These have proved to be more popular each year and considerable expansion has been required at many of these areas to keep up with the demand.

Scenic turnouts offer the motorist an opportunity to pull off the traveled way and enjoy the beauty of Maine relaxed and in safety. At the present time every highway construction project is reviewed for the possibility of including a turnout in connection with the work.

HIGHWAY SAFETY

Uppermost in the minds of research, design and construction engineers of the Maine State Highway Commission are considerations of convenience, a minimum of stress and strain on the driver and above all, SAFETY. The single most powerful force behind the changes in highway design standards in the past 50 years has been the desire to build safe highways.

When funds were available the road was made wider, shoulders were broadened to allow for vehicles to stop safely in an emergency, cuts and fills took the dangerous humps and dips out of the road and ledge excavation carved away rock that interferred with visibility.

When the highway pavement was made more permanent, traffic paint was used to delineate traffic lanes and guide the motorist at times of poor visibility. Highway signs were made reflective so that their message was clear at night.

Because run-off-the-road types of highway accidents increased significantly in the years since World War II, the attention of the highway engineer was turned to the

objects that were a part of the road that increased the severity of this type of accident in collisions - bridge piers and abutments, light standards, sign posts, culverts, utility poles, steep sided slopes, guard rail.

The Commission had established within the Department a new safety committee which consists of design, construction, maintenance and traffic personnel. The men review all projects under design, under construction and those recently built.

In 1969 the Commission was receiving detailed and accurate accident information on the 4,600 miles of federal-aid and state highways thanks to the computer and an engineering technique known as the node-link method of traffic determination.

Accidents are pinpointed by means of the numbering and posting of major highway features (intersections, bridges, etc.,) and all the information is recorded so that it can readily be transferred to a key-punched card for processing and memory-bank storage by computer. Through the use of new engineering techniques the data will be made to yield more useful information in the design and operation of safe and efficient highways.

OPERATION OF THE DEPARTMENT TODAY

In 1970, Maine, which is almost as large as the other five New England states put together, had 21,000 miles of public roads - only a few thousand miles less than the distance around the earth.

Through various enactments the Maine Legislature had placed the responsibility on the State Highway Commission for construction and nearly all of the maintenance of about 4,500 miles of these highways, as well as the summer maintenance of about 7,000 miles on the state aid system.

The Commission enforces the rules and regulations relating to the construction, maintenance, and use of all state and state-aid highways.

The State Highway Commission consists of three members appointed by the Governor with the advice and consent of the Executive Council. One member is of the political party which cast the second highest number of votes in the last gubernatorial election.

One member is appointed by the Governor as chairman and fulltime member of the Commission; he serves seven years and is the chief administrative officer, having general charge of the office and records. But all policy decisions of the Commission must be by a majority of its total membership.

The Commission appoints a chief engineer who is under classified service and who is by law responsible for the supervision of all engineering activities under the control of the Commission. A deputy chief engineer is also appointed who assists the chief engineer in the many details of administration, particularly those related to planning and traffic, programming, safety, materials and research, recruitment, training, procedures review and documentation.

For administrative purposes Maine's total mileage of highways has been classified into three general systems - state highways, which include portions of the federal-aid primary and secondary and interstate systems and other non-federal-aid roads, and are the main-traveled roads of the state, number nearly 3,900 miles; state aid highways, which are essentially connecting routes between communities and their markets, or shipping points and feeders to the state highway system, number over 7,600 miles; and town ways, which are local roads and streets subject to maintenance by municipalities and local civil divisions, number approximately 9,400 miles. There are roughly 4,600 bridges along the public highways of the state, of which over 2,500 are maintained by the Commission.

These are the road systems that serve the transportation needs of the entire state. They make it possible for the farmer to get his produce to market, for industry to ship in supplies and ship out the finished product, for Mr. Average Citizen to commute to his job every day, and for vacation-minded motorists

everywhere to enjoy the natural attractions of the Pine Tree State.

The money needed to build and maintain Maine highways comes from many sources. The largest source, and the one the driver is most aware of, is the revenue gathered from the highway user himself. This is divided into two parts - the 8 cents per gallon on motor fuel, and motor vehicle fees such as registrations, operators' licenses, etc.

Another large source of highway construction funds is the federal-aid program. Federal-aid funds are allocated to the different states for use on selected road systems, and their use is restricted to projects meeting certain standards.

The entire program of the State Highway Commission, involving expenditures of about $70 million per year, is made possible only by the authorization of funds and the passage of the necessary legal enactments by the legislature and the approval of the Governor.

The Commission releases a construction program, just prior to the meeting of legislature, which lists proposed highway projects to be carried out during the following two years - the biennium.

Besides the construction in the federal-state and state categories there are about 30 miles of work carried out along state aid roads during each year of the biennium financed by the special state aid construction fund which is allocated by the legislature. The special fund was first appropriated in 1955 and is for the purpose of aiding towns in completing unimproved gaps in their roads between previously constructed sections, rebuilding sections that require excessive maintenance, and to aid in eliminating hazardous conditions.

Regular state aid projects build approximately 50 miles of highway each season. A little over one-half that mileage is reconstruction and the balance new construction. The various communities raise a portion of the money needed to carry out construction on their state aid highways and the state matches

these funds according to a formula based on the valuation of the community and the type of work to be undertaken. State aid money is the oldest form of highway allotment for road construction dating back, in a slightly different form, to 1908.

Each town receives, from town road improvement fund, a minimum of $200 and additional sums based on the ratio of unimproved roads in the town to the total of unimproved roads in the state. It is estimated that approximately 180 miles of roads are built each year with TRI money. The funds were first appropriated by the legislature in 1945 and were nicknamed "mud money" because the work is usually associated with converting the muddy dirt roads in a community into usable gravel roads.

People frequently ask the Commission: How is the location of a highway project determined? One of the guides in making a choice of a new construction project is the Maine Highway Sufficiency Report, based on a rating method recognized by the U.S. Bureau of Public Roads.

The sufficiency report rates highways and bridges according to their physical condition, such as the amount of gravel base, adequacy of drainage, condition and kind of pavement, shoulder width, alignment and grade. Traffic volumes are reflected in the ratings as well as the existence of a hazardous condition such as a bad curve, or a steep hill.

The report is used by the Commission as a guide, along with the considered judgment of Highway Commission engineers, in determining which sections of the highway will be included in the two-year construction program.

When the sections of road and the bridges have been chosen to be reconstructed, Commission engineers begin the work of designing the new facility. Public hearings are held to explain the preliminary design to the people, usually in or near the town in which the facility is located. In the field, engineers make surveys of the land over which the new highway will run, driving in the stakes to mark the

line of the new highway. Right of way negotiations have already begun. When the final plans are drawn, and the book of specifications has been written, the project is advertised inviting contractors to submit bids in a prescribed manner to the Commission.

The bids are opened by the Commission at a meeting open to the public. The project is awarded to the responsible contractor who has submitted the lowest bid. Through this method of competitive bidding on highway and bridge construction the work is carried out at the lowest possible cost to the taxpayer.

The construction is carried out in accordance with the specifications developed by the Commission and is supervised closely by State Highway Commission engineers and personnel.

After a road is constructed it must be maintained. Some idea of the magnitude of present day highway maintenance is realized when we consider that over 500 men are engaged in an annual surfacing project during each spring and summer. Each season about 6,000 miles of highways throughout the state are resurfaced. Highway Commission crews use approximately 10 million gallons of tar and asphalt in carrying out this maintenance operation.

In addition to surfacing roads, crews replace worn out, obsolete culverts, repair slopes and shoulders along highways, repair guard rails, cut bushes, straighten signs and a hundred other items in the never-ending maintenance operation.

The newly-treated highways are striped for extra safety with a special paint containing glass beads which are reflective at night. A solid or dashed white line is drawn with a special machine down the middle of low volume roads, and, where traffic is heavy, a yellow barrier stripe is placed at hills and curves. A mile of stripe down the middle of the highway takes about as much paint as it does to cover a fair-sized house.

The traffic section of the State Highway Department annually manufactures over 40,000 highway signs to replace broken and weather-worn signs and also erects new signs at new locations to warn and inform the motorist.

Before cold weather comes with a whole new catalogue of problems for the Highway Department, the Commission has ordered enough rock salt to fill a railroad train six miles long. The salt is delivered to Highway Department maintenance areas throughout the state, along with tons of sand to be spread over ice and snow by highway crews.

Winter maintenance represents jobs for over 1,200 men and hundreds of pieces of specialized equipment. It means a 24-hour road patrol and radio service to insure that men and equipment will be in the right place at the right time.

The State Highway Commission maintains its headquarters' offices in Augusta where it occupies the fifth floor and a portion of the fourth floor of the State Office Building.

Just west of the State House complex is the State Highway Commission's garage and machine shop with storage yard. Still further west overlooking the garage is a modern steel and brick building used in the production and storage of the thousands of road signs needed to warn and inform motorists using Maine highways.

Since 1959, when funds have been available, the Commission has constructed new field division office buildings so that division engineers and clerks might perform their duties more efficiently. In each case, division personnel moved from crowded, outmoded quarters in a downtown area.

New division office buildings have been built in Presque Isle - Division 1, Ellsworth - Division 2, Bangor - Division 3, Fairfield - Division 4, Rockland - Division 5, Scarborough - Division 6 and Dixfield - Division 7.

The Bangor building houses both the Commission's Division 3 office staff and the Department's soils and materials testing laboratory. On the upper floor of the attractive brick and concrete building are the offices of the division engineers,

clerks, supervisors, radio rooms and drafting rooms. Also on the upper floor are the soils and testing engineers' offices and space for the geologists, photo interpretation and a bituminous laboratory. On the lower floor are laboratories for structural testing, cement and concrete, fine and coarse sifting, soils mechanics, frost stabilization, cold room, moist room and research.

Also, in recent years, a program of building construction has been carried out by the Commission's maintenance and state aid division. Maintenance personnel have built new storage sheds throughout the state providing a central headquarters for crews and protection for valuable Department equipment. With the equipment under cover maintenancemen can wash them down and perform routine maintenance thereby helping to prolong their useful lives.

The chief responsibility of the Maine State Highway Commission since it was established back in 1913 has been to convert the primitive, isolated sections of road in the state into a modern system of highways, and to give that system high standards of utility and safety.

Every effort is made by highway specialists to insure that Maine citizens get the best-engineered roads and bridges in locations where they will last the longest, do the most good for the greatest number of people, and still cost as little as possible.

Searching for and finding the right design, the right materials and the right location in building better highways to serve the transportation needs of the State of Maine is the continuing challenge to the highway engineer.

###