A REPORT

to the

NINETY - SEVENTH LEGISLATURE

on the

ACCELERATED HIGHWAY PROGRAM

and

OTHER ACTIVITIES AND METHODS OF OPERATION

of the

STATE HIGHWAY DEPARTMENT

Prepared By The

MAINE STATE HIGHWAY COMMISSION

February, 1955

STATE HIGHWAY COMMISSION

STATE OF MAINE

AUGUSTA

February 16, 1955

To the Honorable Senate and House of Representatives
of the Ninety-Seventh Legislature:

Transmitted herewith is a report relating to the Accelerated Highway Program, dated January 1, 1951 and other activities of this Department.

Respectfully,

STATE HIGHWAY COMMISSION,

David H. Stevens, Chairman

Clarence S. Crosby

Harold B. Emery

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A. INTRODUCTION

The following report contains a history of the progress of the Accelerated Program and other activities and methods of operation of the highway department.

B. DEFINITIONS

1. Rough Estimate. This method is actually a guess, based on a cost per mile for highways and a cost per square foot for bridges. This method is used in the early stages of all projects to set up funds. Made far in advance of "on-the-ground" surveys, these estimates have no factual basis except past experience. It is understood throughout the construction industry that a rough estimate is always subject to revision after a survey is made and actual quantities are available.

2. Engineer's Estimate. Based on quantities obtained from an "on-the-ground" survey. Unit prices are applied to items such as "cubic yards", "square yards", "tons", "gallons", etc. These unit prices take into account the past records for unit prices, the area where the project is located, the labor market, the materials market, the availability of Contractors and the season. It is the Engineer's estimate that is used to test the validity of the bid submitted by the Contractor.

3. Contract Estimate. Based on the quantities in the Engineer's Estimate, the Contractor's Bide Prices are applied. It is this estimate that is used throughout the construction period as well as the basis for the estimated amount of federal participation.

4. Final Quantity Estimate. Based on quantities obtained from a final survey after the completion of construction and the application of the contract unit prices. It is on this estimate that the Contractor's final payments are based as well as the amount of federal participation.

C. Estimated Costs as shown in Accelerated Program.

The figures were obtained by using the Rough Estimate Method. Practically no surveys had been made and no Engineer's Estimates were available. The

deficiencies in a certain section as found by the Highway Needs Study of 1948 and the type of correction needed to bring the section to the tolerable standards set up at that time were considered and a cost per mile figure, as well as a square foot cost for bridges, were applied to that section. The estimated costs per mile varied from $10,000 for resurfacing a secondary road carrying 400 vehicles per day to $132,000 for new construction on the primary system carrying 4,900 vehicles per day. Obviously, the cost figures are conservative. The total costs could not be obtained by any other method. With an engineering force barely large enough to handle 100 miles of construction in a year, Engineering Estimates on 1,600 miles could not be obtained in the period allowed for the production of the Accelerated Program. Experience and judgment play a large part in making estimates of this kind. It is the considered opinion of the Department that in the short time allowed for producing the program for the 95th Legislature, with no time for research work on costs, with no time nor facilities for forecasting future trends that the program as issued, represented the best thinking available for the work at that time.

D. FACTORS AFFECTING CONSTRUCTION COSTS. Many things have occurred in the past five years to influence construction costs in this area. Despite the fact that more efficient machinery and methods have been placed in use, other factors have caused total costs to increase.

1. Cost Indexes.

Many methods are used to arrive at a cost index to reflect various factors. These methods vary in each state and the Bureau of Public Roads has their own method. A few of these, as they are available are shown below: (1949 = 100)

Source	High	Qtr. (Year)	% Change
U.S. BPR (Composite Mile	114	1st '53	14
Conn.	126	1st '52	26
E.N.R. (Boston)	128	3rd '54	28
E.N.R. (New York)	138	3rd '54	38
Penn.	112	'51	12
E.N.R. (Pittsburg)	135	3rd '54	35
E.N.R. (Philadelphia)	139	3rd '54	35
Miss.	124	'51-'52	24
Minn.	129	'51-'52	29
E.N.R. (New Orleans)	139	3rd '54	39
E.N.R. (Minneapolis)	137	3rd '54	37
Col.	102	'52	2
Tex.	123	1st '53	23
E.N.R. (Dallas)	123	3rd '54	23
E.N.R. (Denver)	133	3rd '54	33
Wash.	99	1st '52	1
Ore.	114	2nd '52	14
E.N.R. (Seattle)	128	3rd '54	28
Cal.	129	2nd '51	29
E.N.R. (San Francisco)	130	3rd '54	30
E.N.R. (Los Angeles)	137	3rd '54	37
Maine	--	'52	32

U.S. B.P.R. is U.S. Bureau of Public Roads
E.N.R. is Engineering News Record

Note: Minn. and U.S. B.P.R. indexes are corrected for desing changes. Various bases are used in different states buththe above table has been converted to a 1949 = 100 base for comparison purposes. The above are computed from weighted averages of average bid prices.

E.N.R. shows an increase in the 20 city average for construction wages per hour as follows:

	1948	1949	1953	1953 % increase over 1948	1953 % increase over 1949
Skilled labor	1.80	2.41	3.01	67	25
Common labor	1.03	1.45	1.88	83	30

Engineering News Record comments that while there has been a drop in cost indexes since the peaks of 1951 and 1952, this is caused by strong competition in bidding even though costs are still on the increase. This is indicated in the E.N.R. listing of indexes by cities for 1954. The decrease in the index is noted by the BPR index for the 1954 composite mile dropping to only 10% over the 1949 base.

To show the trend in unit prices in this State, the following table shows the weighted averages of the low bids on primary projects for selected items:

Item	Unit	1949	1950	1951	1952	1953	1954
Clearing & Grubbing	Acre	302.45	381.84	---	---	---	---
Clearing	Acre	---	---	439.31	452.92	368.63	399.56
Earth Excavation	C.Y.	0.64	0.56	0.67	0.91	0.63	0.72
Rock Excavation	C.Y.	3.17	3.51	3.88	3.81	2.90	3.58
Exca. for Structures	C.Y.	1.89	1.88	2.25	3.00	2.32	2.45
Common Borrow	C.Y.	0.49	0.46	0.66	0.68	0.71	0.56
Gravel Base	C.Y.	0.80	0.83	1.00	1.08	0.88	0.78
Class "A" Concrete	C.Y.	44.51	39.18	60.00	62.88	59.88	53.91
Granite Curb	l.f.	3.52	3.80	4.29	5.10	3.97	4.02

2. Changes in design standards.

No. phase of highway work in the past five years has changed more than the building of safety into the facility. The trend has been to increase design speeds to more nearly approximate the operating speeds. This has meant the construction of wider and better pavements, wider shoulders, wider structures, flatter horizontal curves, longer vertical curves to provide more sight distances

the construction of passing lanes on hills and at intersections, and the lighting and better signing of intersections.

Increases in legal load limits, the increase in traffic in general and the increase in truck traffic in particular have led us to designing stronger pavements and base. An attendant feature of obtaining this extra strength is through the processing of gravels and increasing underground drainage.

Increases in the use of the highways in this State is best shown by registrations.

These are as follows:

	1949	1950	1951	1952	1953	1954
Automobiles	190,079	208,998	213,390	219,611	227,927	238,407
Busses 1/	1,013	1,004	1,116	1,064	1,046	1,050 2/
Trucks	58,121	62,300	61,506	62,578	63,137	65,327
Totals	249,213	272,302	276,012	283,253	292,110	304,784

1/ Includes School Busses 2/ Estimated

For the U. S. as a whole, there were, in 1949, more than 45 million motor vehicles registered; in 1954, more than 56 million vehicles and it is expected that by 1965, 81 million vehicles will be on the roads. This information is presented to show the alarming increases in traffic that have and will continue to take place. No. such increases were even dreamed of five years ago.

3. Additional factors involved in increasing costs.

(a) Right of Way. As designs are improved, additional right of way must be secured and the greater the liability for damages for changes in grade. At one time it was possible to roll the grade up over the top of a hill. Now, to obtain the proper sight distance, it is necessary to cut 4, 5, even 10 feet. This means damage payments will have to be made. Where once it was possible to roll down on six percent grade, across a four foot fill on a 200 foot vertical curve and up another six percent grade, it is now necessary not only to cut grades down and possibly construct truck passing lanes but we must have an 850

foot vertical curve in the sag, meaning a 13 foot fill, and all leading towards damages and additional land. Where once we were building pavements 20 feet in width and shoulders 3 feet in width with the ditches 20 feet from centerline, we now construct pavements 24 feet in width with shoulders 6, 8, or 10 feet in width (depending upon traffic volumes and design speeds) with ditches out 30 to 40 feet from the centerline. This means more trees, more front lawns, more buildings, more damages.

(b) Contruction Costs in Defense Areas

Because of heavy construction at large defense installations such as Portsmouth Air Base, Kittery Navy Yard, Brunswick Naval Air Station, Dow Field Bangor and Loring Air Base Limestone, the labor situation in these areas has been serious. Most of this work has been done or is being done by large out-of -State Contractors. Many highway Contractors cannot compete for labor and therefore must suffer along with an insufficient force. This condition is certainly reflected in bids on a road and bridge projects in those areas. For example, no bids were received on a bridge project in Kittery this year. It was necessary to negotiate a contract, which was done with the approval of the Governor and Council. One highway project in Aroostook County, this year, had four bidders, two others three bidders each. On a bridge project just north of Kittery only one bid was received and on a bridge in Aroostook County only 2 bids were received. The usual number of bidders on a project in other parts of the state ranges from five to ten.

(c) Construction Costs in Aroostook County

Aroostook County in particular differs from the other parts of the State in that it is away from the center of construction headquarters. In other words, it means large moving costs on heavy equipment over greater distances than to most parts of the State. Comparatively few contractors have headquarters in Aroostook. Materials supplies and poor quality of gravel in Aroostook further add to the reasons why work in that area costs more than in other regions.

(d) Engineering Costs

Because it has been impossible to increase our own engineering forces to the extent necessary to look after the increased volume of work, it has been necessary to hire outside surveying crews and to engage the services of Consulting Engineers. Furthermore, the size of such projects as Fore River and Bangor-Brewer Bridges and the East Deering By-Pass made it imperative to use Consulting Engineers. Through the device of keeping our own survey crews working throughout the year for the past two years, we now have a backlog of projects ready and it is not expected that it will be necessary to engage private firms except for unusually large projects. It is not believed that engineering costs as a percentage of the total cost have increased materially.

E. HISTORY OF FOUR PROJECTS

There has been mention made of two specific projects, Mapleton-Castle Hill, a secondary project and Easton, a primary project. Following are complete histories of those two projects and in addition, the history of Franklin, a typical secondary project and Gardiner-Richmond, a typical primary project.

1. MAPLETON-CASTLE HILL PROJECT

In the Accelerated Highway Program, an item recommending reconstruction in Aroostook County of a section of State Highway 326 between Presque Isle and Ashland reads as follows:

Item 22, Mapleton, Route 163; Length 4.96 miles; Annual Daily Traffic, 1200 vehicles; Deficient in Type and Maintenance; Estimated Bridge Cost $11,000; Estimated Total Cost $260,000.

The average cost per mile was estimated at $52,420 which included cost of correcting bridge deficiencies. This amount per mile would provide reconstruction with little or no improvement in grades, width or type of surface, and vision. The old tarred roadway width averaged under 20 feet with narrow shoulders. Because of serious underground water seeping into the old roadway, several sections were badly broken up. Maintenance of this road was expensive and the cost per mile was as follows: in 1950, $2,318; in 1951, $1,220; in 1952, $1,229 and in 1953, $966.

In 1953 this work was tentatively programmed as State Project 132 for $300,000 still without an actual engineering estimate on which to base expected cost of the project; this to be 100% State funds.

During the winter of 1953-54 plans and design for this project were completed. The project was changed from State Project 132 to F.A.S. Project S-0326(6) which would be financed jointly by Federal and State funds.

The design was adjusted to meet requirements acceptable to the Bureau of Public Roads and in line with standards of the American Association of State Highway Officials. This design should be adequate for traffic requirements over the

next twenty years. In 1953 the average daily traffic was found to be 1,342 vehicles with a section of the road having a low traffic of 1,100 vehicles and another section carrying a high of 1,500 vehicles. The amount of this traffic estimated to be trucks was 19%.

To conform with the requirements for the above average daily traffic and design speeds up to 50 miles per hour, the surfacing was required to be twenty-two (22) feet minimum width with six (6) foot wide shoulders. A high type surface was required. This could be either bituminous concrete or bituminous macadam. Grades and sight distances were also required to conform with minimums for traffic and speed demands.

An Engineer's Estimate was first completed on February 17, 1954. This called for construction of 5.057 miles at an estimated contract cost of $554,935.25 plus Engineering and Contingencies amounting to $45,064.75 or a total estimated cost of $600,000 with half of this amount requested from Federal funds. The slight increase in length from that of Item 22 of the Accelerated Program was to allow construction of about 750 feet in Castle Hill because of a slight relocation at the Mapleton-Castle Hill town line.

On April 21, 22 and 23 a detailed visual field inspection of the project was made by our Engineers in company with an engineer from the Bureau of Public Roads. Minute check of the plan details with existing features of terrain and abutting property characteristics was made during this inspection. Where possible, economies in design were recommended and grades were adjusted to better meet abutting properties. Construction features through the village of Mapleton were discussed with the Town Manager.

Following this inspection trip the plan details were corrected as recommended. Final design features included:

(a) A truck lane having a paved width of 11 feet from stations 72 to 93, being over 2,000 feet long. This location was over old grades of from 7.2% to 13% where the new grades will be 7.2% to 9.0%.

(b) Other improvement in grades was called for between stations 98 to 107 where the old grades of 8% to 11% will be 7.2% to 8.5%; stations 119 to 122 where a section of 11% grade will be reduced to 7%; and west of station 170 where a short section of 9% grade will be reduced to 7.2%.

(c) A sharp hill crest at station 165+50, where the passing sight distance was limited to 260 feet will be cut so that the sight distance will be increased to 475 feet conforming with safety requirements up to 40 miles per hour speed. This required a maximum depth of excavation in earth and ledge of eight and one half (8½) feet.

(d) From stations 200 to 230, a distance of 3,000 feet, through Mapleton Village the surfaced roadway width will be forty (40) feet with storm drainage installations. Sidewalks will be constructed on each side through part of the village; on the right from stations 211+45 to 224+25 and on the left from stations 215+30 to 223+50.

Following the incorporation of all recommended changes in the design a revised Engineer's Estimate was completed in June 1954. This was broken down as follows:

	Contract Sub-total	Eng. & Contingencies	Total
Roadway	$457,634.08	$45,755.92	$503,390.00
Brennan Bridge	24,085.25	2,404.75	26,490.00
Mapleton Bridge	20,241.12	2,018.88	22,260.00
Libby Brook Bridge	32,447.80	3,212.20	35,660.00
Totals	$534,408.25	$53,391.75	$587,800.00

Unfortunately, it was not possible to balance the cuts and fills on this project. The finished roadway was adjusted as nearly as possible to meet abutting lawns and other property thereby avoiding excessive damages and claims. As a result of this, the total project shows an excess of excavation of more than 29,000 cubic yards for which there is no available fills in the roadway.

There is also a sizable item which is included in the contingency amount,

being a cost of approximately $20,000 for raising the railroad overpass at Mapleton Village. The underclearance of the old structure was about twelve (12) feet over the old road while the new underclearance will be about four-teen and one-half (14½) feet which is in line with present day requirements.

Because of the wet condition of the subsoil and the large amount of free water, both on the surface and underground, large amounts of culvert pipe were estimated. Included in this drainage total are over 6,000 linear feet of perforated pipe for underdrains, much of which installation will be in ledge cuts.

Bids for project, including surface, were opened on August 4, 1954 with the following results:

Bridge Construction Corp., Augusta	$629,346.50
Thomas DiCenzo, Calais	635,881.50
W. H. Hinman, Inc., No. Anson	640,494.15

These bids, being in excess of the Contract Estimate of $534,408.25, were all rejected by the State Highway Commission. A recheck of the design and specifications was made.

It was decided to readvertise the project, after revising the specifications:

(a) to allow pit run gravel with stones not exceeding twelve (12) inches in size to be used in lower layers of gravel base where previously six (6) inch maximum size stones were specified;

(b) to allow six (6) inch maximum size stones to remain in the upper nine (9) inch gravel base course instead of requiring the course to be "Crushed Gravel Base" having no stones greater than 4½ inches in size.

(c) to proceed as a stage construction project. This would allow bids to be taken at a later date for the pavement, thus allowing the grading and base to be completed and settlement to take place.

The above changes would allow the same base requirements used for many years to apply to the lower base layers. The larger stones (over 6 inches) would be removed from the upper base layer thus providing a well graded base, which would cost less than the crushed gravel type which is often used on roads carrying heavier traffic.

After readvertising, bids were opened on September 1, 1954 with the following bidders:

Keltic Construction, Inc., Houlton	$460,523.55
Bridge Construction Corp., Augusta	471,046.50
Thomas DiCenzo, Calais	489,885.50

These bids excluded the surfacing items which are estimated to amount to $131,370.00. A separate contract for this work will be advertised for after the work on the current contract is completed.

The low bid, from the Keltic Construction, Inc., of Houlton, was declared to be informal and the contract awarded to the second bidder. This was necessary because Keltic Construction, Inc. was not formally organized, since their papers of incorporation were not on file in the office of the Secretary of State, and it was ruled by the Ass't. Atty. General that they could not legally bid as a corporation.

A summary of the contract as awarded plus the engineering estimate for the future surfacing is as follows:

	Contract Amount	Est. Eng. & Contingencies	Total
Roadway	$372,532.10	$37,197.90	$409,730.00
Brennan Bridge	31,981.00	3,119.00	35,100.00
Mapleton Bridge	32,162.40	3,207.60	35,370.00
Libby Brook Bridge	34,371.00	3,429.00	37,800.00
Present Contract	$471,046.50	$46,953.50	$518,000.00
Future Bit.Conc. Surf.	131,370.00	12,630.00	144,000.00
Total	$602,416.50	$59,583.50	$662,000.00

Federal funds requested for the total project amount to $331,000.00.

The resident engineer assigned to this project is Dewey C. Gray, Jr.

Many of the design features required in this project were not contemplated in estimates of cost in the Accelerated Program amounting to $260,000 nor in programming the State Project 132 amounting to $300,000. To summarize briefly some of these features which increased the cost were: the 2,000 foot truck lane; sight distance requirements; need for wasting 29,000 cubic yards of surplus excavation; roadway width of forty (40) feet; storm sewer for a distance of 3,000 feet through Mapleton Village; cost of $108,270 for bridge widening and construction; cost of $20,000 for raising the railroad underpass and the need for a high type pavement.

The estimated cost per mile of $130,907.65 makes this the most expensive rural secondary project ever constructed by this department. The locality and terrain, the material supply, the lack of competition in bidding, and the design requirements all contributed towards this cost.

An itemized list of unit prices as bid, along with the Engineers Estimate, follows.

BIDS RECEIVED BY THE STATE HIGHWAY COMMISSION, SEPT. 1, 1954
STATE ROUTE 163, FEDERAL AID SECONDARY PROJ. NO. S-0326(6),Sec.1 & Sec.2
MAPLETON AND CASTLE HILL, 5.057 MILES BITUMINOUS CONCRETE ROAD
(stage construction)

				(Informal) Keltic Constr.,Inc. (Proposed) Houlton, Maine		Bridge Constr.Corp. Augusta, Maine		Thomas DiCenzo Calais, Maine		Engineer's Estimate	
Item No.	Quantity	Unit	Description	Price	Amount	Price	Amount	Price	Amount	Price	Amount
201-5	2	acre	Clearing	375.00	750.00	500.00	1,000.00	500.00	1,000.00	400.00	800.00
202-5	3	each	Removing Trees (9"-24")	75.00	225.00	60.00	180.00	50.00	150.00	25.00	75.00
202-6	1	each	Removing Trees (over 24")	150.00	150.00	150.00	150.00	200.00	200.00	50.00	50.00
203-9	83,000	c.y.	Earth Excavation	.77	63,910.00	.80	66,400.00	.80	66,400.00	.80	66,400.00
203-10	7,500	c.y.	Rock Excavation	3.20	24,000.00	4.00	30,000.00	4.00	30,000.00	3.50	26,250.00
204-10	4,500	c.y.	Struct. Earth Excav.-Drainage	2.20	9,900.00	2.75	12,375.00	3.00	13,500.00	2.25	10,125.00
204-11	200	c.y.	Struct. Rock Excav.-Drainage	9.00	1,800.00	16.00	3,200.00	20.00	4,000.00	12.00	2,400.00
204-12	2,000	c.y.	Struct. Earth Excav.,Abuts.& Ret. Walls	3.50	7,000.00	4.25	8,500.00	4.00	8,000.00	3.00	6,000.00
204-13	120	c.y.	Struct. Rock Excav., Abuts & Ret. Walls	14.00	1,680.00	20.00	2,400.00	20.00	2,400.00	20.00	2,400.00
204-16	210	c.y.	Struct. Earth Excav.-Channel	2.20	462.00	2.00	420.00	3.00	630.00	2.20	462.00
204-18	45	c.y.	Removing Exist. Concrete	32.00	1,440.00	45.00	2,025.00	45.00	2,025.00	12.00	540.00
204-19	183	l.f.	Removing Existing Conc. Rail	3.00	549.00	7.00	1,281.00	7.00	1,281.00	2.00	366.00
205-10	2,000	c.y.	Gravel Borrow	.85	1,700.00	1.50	3,000.00	1.25	2,500.00	.70	1,400.00
302-7	52,000	c.y.	Gravel Base Crse."B", In Place Meas.	1.18	61,360.00	1.00	52,000.00	1.10	57,200.00	1.10	57,200.00
302-11	40,000	c.y.	Gravel Base Crse.,"A", In Place Meas.	1.30	52,000.00	1.65	66,000.00	1.75	70,000.00	1.20	48,000.00
308-5	190,000	yd.mi.	Overhaul, In Place Meas.	.10	19,000.00	.10	19,000.00	.10	19,000.00	.10	19,000.00
308-6	4,000	yd.mi.	Overhaul, Pit Meas.	.08	320.00	.08	320.00	.08	320.00	.08	320.00
309-5	8,000	c.y.	Stripping Pits	.20	1,600.00	.30	2,400.00	.40	3,200.00	.25	2,000.00
310-6	200	unit	Sprinkling	5.00	1,000.00	6.00	1,200.00	5.00	1,000.00	4.00	800.00
311-6	25	ton	Calcium Chloride	90.00	2,250.00	100.00	2,500.00	100.00	2,500.00	70.00	1,750.00
401-10	3,000	c.y.	Gravel Surface Course	4.40	13,200.00	4.00	12,000.00	4.00	12,000.00	2.75	8,250.00
501-7	60,000	gal.	Road Tar	.38	22,800.00	.30	18,000.00	.35	21,000.00	.30	18,000.00
601-10	700	l.f.	12" C.M.P.	2.40	1,680.00	2.50	1,750.00	2.50	1,750.00	2.25	1,575.00
601-11	1,000	l.f.	15" C.M.P.	2.90	2,900.00	3.00	3,000.00	2.75	2,750.00	2.75	2,750.00
601-12	650	l.f.	18" C.M.P.	3.40	2,210.00	3.50	2,275.00	3.00	1,950.00	3.25	2,112.50
601-13	62	l.f.	21" C.M.P.	4.00	248.00	3.75	232.50	4.00	248.00	3.75	232.50
601-15	110	l.f.	30" C.M.P.	7.50	825.00	6.00	660.00	6.00	660.00	6.00	660.00
601-21	20	l.f.	Removing & Relaying 15" C.M.P.	2.20	44.00	1.50	30.00	2.00	40.00	1.50	30.00
601-22	70	l.f.	Removing & Relaying 24" C.M.P.	3.30	231.00	2.50	175.00	3.00	210.00	2.00	140.00
602-10	360	l.f.	12" A.C.C.M.P.	2.80	1,008.00	2.75	990.00	2.75	990.00	3.00	1,080.00
602-11	655	l.f.	15" A.C.C.M.P.	3.30	2,161.50	3.50	2,292.50	3.50	2,292.50	3.50	2,292.50
602-12	450	l.f.	18" A.C.C.M.P.	3.80	1,710.00	4.00	1,800.00	5.00	2,250.00	4.00	1,800.00
602-13	150	l.f.	21" A.C.C.M.P.	4.40	660.00	4.60	690.00	5.00	750.00	4.50	675.00
602-14	255	l.f.	24" A.C.C.M.P.	5.25	1,338.75	6.00	1,530.00	6.00	1,530.00	5.50	1,402.50
602-15	265	l.f.	30" A.C.C.M.P.	8.00	2,120.00	7.20	1,908.00	7.00	1,855.00	6.50	1,722.50
602-16	298	l.f.	36" A.C.C.M.P.	11.00	3,278.00	12.00	3,576.00	12.00	3,576.00	10.00	2,980.00
602-20	96	l.f.	60" A.C.C.M.P.	22.00	2,112.00	25.00	2,400.00	25.00	2,400.00	25.00	2,400.00
605-13	25	each	Catch Basins - Type "A"	320.00	8,000.00	250.00	6,250.00	200.00	5,000.00	250.00	6,250.00
605-16	4	each	Catch Basins - Type "D"	260.00	1,040.00	250.00	1,000.00	250.00	1,000.00	250.00	1,000.00
606-10	4,000	l.f.	Underdrain, Type "B"	2.60	10,400.00	2.50	10,000.00	2.00	8,000.00	2.00	8,000.00
606-11	1,000	l.f.	12" Underdrain, Type "C"	3.80	3,800.00	4.00	4,000.00	4.50	4,500.00	3.50	3,500.00
606-12	250	l.f.	15" Underdrain, Type "C"	4.30	1,075.00	4.50	1,125.00	5.00	1,250.00	4.00	1,000.00
606-13	550	l.f.	18" Underdrain, Type "C"	4.80	2,640.00	5.00	2,750.00	5.50	3,025.00	4.50	2,475.00
606-16	900	l.f.	Underdrain Outlets	1.40	1,260.00	1.50	1,350.00	1.50	1,350.00	1.50	1,350.00
701-33	655	c.y.	Port. Cem. Conc.,Abuts.& Ret. Walls	57.00	37,335.00	52.00	34,060.00	62.00	40,610.00	40.00	26,200.00
701-38	120	c.y.	Port. Cem. Conc., Floor Slabs	72.00	8,640.00	35.00	4,200.00	62.00	7,440.00	50.00	6,000.00
701-39	122	c.y.	Port. Cem. Conc., Superstr. Slabs	75.00	9,150.00	40.00	4,880.00	65.00	7,930.00	60.00	7,320.00
701-41	98	c.y.	Portl. Cem. Conc., Superstr.T-Beam Type	83.00	8,134.00	60.00	5,880.00	78.00	7,644.00	60.00	5,880.00
701-46	85	l.f.	Port. Cem. Conc., Rail	12.00	1,020.00	8.00	680.00	10.00	850.00	10.00	850.00
701-47	1,350	bbls.	Portland Cement	4.60	6,210.00	6.50	8,775.00	6.00	8,100.00	6.00	8,100.00
705-13	53,800	lbs.	Reinforcing Steel, Delivered	.13	6,994.00	.15	8,070.00	.12	6,456.00	.12	6,456.00
705-14	53,800	lbs.	Reinforcing Steel, Placing	.04	2,152.00	.05	2,690.00	.03	1,614.00	.04	2,152.00
803-7	1	l.s.	Cofferdams, Mapleton Br.	2,700.00	2,700.00	7,000.00	7,000.00	3,500.00	3,500.00	1,000.00	1,000.00
803-8	1	l.s.	Cofferdams, Brennan Br.	1,800.00	1,800.00	6,000.00	6,000.00	4,200.00	4,200.00	2,000.00	2,000.00
804-6	25	c.y.	French Drains	12.00	300.00	4.00	100.00	5.00	125.00	3.00	75.00
904-11	4	c.y.	Reinforced Concrete Steps	90.00	360.00	100.00	400.00	100.00	400.00	50.00	200.00
905-22	2,800	l.f.	Guard Rail, Type "A"	1.60	4,480.00	1.25	3,500.00	1.25	3,500.00	1.30	3,640.00
905-26	369	l.f.	Guard Rail, Type "E"	3.75	1,383.75	3.50	1,291.50	3.50	1,291.50	3.00	1,107.00
905-30	22	each	Anchorages for Types "A"&"B" Gd. Rail	25.00	550.00	30.00	660.00	30.00	660.00	25.00	550.00
905-33	6	each	End Wings	7.50	45.00	10.00	60.00	10.00	60.00	5.00	30.00
905-34	120	each	Guard Posts - Type "A"	4.00	480.00	6.50	780.00	6.00	720.00	5.00	600.00
906-17	515	l.f.	Fencing - Wood Posts	.65	334.75	.60	309.00	.50	257.50	.45	231.75
906-19	1	each	Barways - Wood Posts	25.00	25.00	25.00	25.00	25.00	25.00	20.00	20.00
907-9	100	c.y.	Plain Riprap	7.00	700.00	7.00	700.00	8.00	800.00	4.00	400.00
907-10	192	c.y.	Hand Laid Riprap	9.50	1,824.00	8.00	1,536.00	10.00	1,920.00	8.00	1,536.00
908-9	1,700	c.y.	Loam Borrow	3.30	5,610.00	3.00	5,100.00	3.00	5,100.00	2.50	4,250.00
909-7	11,000	s.y.	Sodding	1.55	17,050.00	1.40	15,400.00	1.50	16,500.00	1.50	16,500.00
910-9	24	unit	Seeding-Roadside Mixture	40.00	960.00	15.00	360.00	15.00	360.00	15.00	360.00
910-10	25	unit	Seeding - Parkway Mixture	60.00	1,500.00	15.00	375.00	20.00	500.00	20.00	500.00
911-6	600	l.f.	Slope Checks	.40	240.00	.40	240.00	.50	300.00	.50	300.00
913-7	2	each	Project Markers - Setting Only	50.00	100.00	15.00	30.00	15.00	30.00	12.00	24.00
914-6	60	each	Right of Way Monuments	10.00	600.00	15.00	900.00	15.00	900.00	12.00	720.00
918-7	32	l.f.	Metal Sluice	3.40	108.80	5.00	160.00	5.00	160.00	4.00	128.00
920-4	1	l.s.	Moving Buildings	1,800.00	1,800.00	2,500.00	2,500.00	2,000.00	2,000.00	2,000.00	2,000.00
921-4	250	each	Cement Building Blocks	.40	100.00	1.00	250.00	1.00	250.00	.60	150.00
			TOTALS		460,523.55		471,046.50		489,885.50		417,295.25

A TRUE COPY: Sylvester L. Foss
Engineer of Secondary Highways

ATTEST: Joseph M. Leavitt
Justice of the Peace

2. FRANKLIN PROJECT.

The Accelerated Highway Program included the following item covering a section of State Aid highway in Hancock County:

Item 5, Franklin, Route 182, Length 7.80 miles, Annual Daily Traffic 685 vehicles, Deficient in Maintenance; Estimated Total Cost $280,000.

The average cost per mile for the 7.80 miles found to be deficient was estimated at $35,900. This project was located in rolling country and had few bad grades or restricted vision. The type of surfacing required was intermediate (bituminous gravel mix-in-place) type having a width of 22 feet and four (4) foot wide shoulders.

A section of the above Item 5 located west from Franklin Village was programmed in 1953 for construction during 1953-54. This project was designated F.A.S. Project S-0298(2) having an estimated length of 2.30 miles and estimated cost of $160,000, half of which was requested to be Federal funds.

The design of this project was completed in the winter and spring of 1953, and in August 1953 an Engineer's Estimate for 2.138 miles was completed. The cost was estimated to amount to $151,055.40 for contract work plus engineering and contingencies of $15,044.60, giving the total estimated amount as $166,100.00; of which $80,000 in Federal funds was asked.

On August 19, 1953, bids for this 2.138 mile long project were opened as follows:

H. E. Sargent, Inc. , Stillwater	$123,457.50
Thomas DiCenzo, Calais	128,476.25
Cianchette Bros., Pittsfield	129,944.50
A. P. Wyman, Inc., Waterville	148,023.00
Bridge Construction Corp., Augusta	149,999.99
Wyman & Simpson, Inc., Augusta	152,467.20
Lee Brothers, Albion	156,630.75

The contract was awarded to the low bidder for $123,661.50 including foundation gravel not in bid figures amounting to $204.00. The agreement with the Bureau of Public Roads was as follows:

Contract sub-total	$ 123,661.50
Engineering and Contingencies	12,338.50
Total Cost	$ 136,000.00

Federal funds requested were $68,000.00

The engineer was Roger H. Sargent.

This 2.138 mile project was satisfactorily completed on August 15, 1954. The approximate amount of the final quantity estimate will be $117,000.00, Engineering and Contingencies come to $8,000.00, making the total cost of the project approximately $125,000.00 or $58,465.80 per mile.

An itemized list of unit prices as bid, along with the Engineer's Estimate follows:

BIDS RECEIVED BY THE STATE HIGHWAY COMMISSION * August 19, 1953

F.A.S. Proj. No. S-0298(20), Franklin 2.138 Miles of Bituminous Gravel Road

Item No.	Quantity	Unit	Description	H. E. Sargent, Inc. Stillwater, Maine		Thomas DiCenzo Calais, Maine		Cianchette Bros. 29 Hunnewell Ave. Pittsfield, Maine	
				Price	Amount	Price	Amount	Price	Amount
11	4	acres	Clearing	350.00	1,400.00	500.00	2,000.00	350.00	1,400.00
12A	11,000	c.y.	Earth Excavation	.60	6,600.00	1.70	18,700.00	.70	7,700.00
12B	6,300	c.y.	Rock Excavation	3.50	22,050.00	1.72	10,836.00	3.50	22,050.00
12D	3,500	c.y.	Muck Excavation	.50	1,750.00	.50	1,750.00	.60	2,100.00
12E	18	each	Trees Removed	25.00	450.00	30.00	540.00	35.00	630.00
12G	3,000	c.y.	Stripping Pits	.25	750.00	.15	450.00	.25	750.00
13A	600	c.y.	Excavation for Structures	2.00	1,200.00	2.50	1,500.00	2.00	1,200.00
13B	20	c.y.	Rock Excav. for Structures	25.00	500.00	30.00	600.00	20.00	400.00
17A	35,000	c.y.	Common Borrow	.54	18,900.00	.55	19,250.00	.60	21,000.00
24A	24,000	c.y.	Gravel Base Course	.85	20,400.00	.90	21,600.00	.85	20,400.00
33A	1,780	c.y.	Surf. Tr. Gravel Course	2.50	4,450.00	2.00	3,560.00	2.50	4,450.00
33B	17,000	gals.	Bituminous Material	.21	3,570.00	.25	4,250.00	.23	3,910.00
34A	1,700	c.y.	Bituminous Grav. Surf. Crse.(MIP)	3.00	5,100.00	3.00	5,100.00	3.50	5,950.00
34B	34,000	gals.	Bituminous Material	.23	7,820.00	.25	8,500.00	.23	7,820.00
34D	350	tons	Stone Chips	10.00	3,500.00	10.00	3,500.00	9.00	3,150.00
46	17	c.y.	Dry Rubble Masonry	40.00	680.00	25.00	425.00	8.00	136.00
47C	571	l.f.	12" C.M.P.	2.00	1,142.00	2.25	1,284.75	2.00	1,142.00
47D	152	l.f.	15" C.M.P.	2.50	380.00	2.75	418.00	2.50	380.00
48E	652	l.f.	18" A.C.C.M.P.	3.50	2,282.00	3.25	2,119.00	3.25	2,119.00
48G	146	l.f.	24" A.C.C.M.P.	5.00	730.00	5.00	730.00	5.00	730.00
48H	69	l.f.	30" A.C.C.M.P.	6.50	448.50	6.50	448.50	6.50	448.50
48M	65	l.f.	60" A.C.C.M.P.	22.00	1,430.00	23.00	1,495.00	22.00	1,430.00
50D	12	l.f.	24" R.C.P.	8.00	96.00	6.25	75.00	6.50	78.00
50F	38	l.f.	36" R.C.P.	15.00	570.00	15.00	570.00	12.00	456.00
51H	3	l.f.	24" Vit. Clay Pipe	10.00	30.00	5.00	15.00	5.00	15.00
53	30	c.y.	Plain Rip-rap	4.00	120.00	7.00	210.00	5.00	150.00
54	20	c.y.	Hand-Laid Rip-rap	7.00	140.00	10.00	200.00	8.00	160.00
55B	300	l.f.	Underdrain Type B	2.00	600.00	2.00	600.00	2.00	600.00
55G	40	l.f.	Underdrain Outlets	2.00	80.00	1.00	40.00	1.50	60.00
65A	4,760	l.f.	Wire Cable Gd. Rail Type A	1.15	5,474.00	1.25	5,950.00	1.30	6,188.00
65C	26	each	Anchorages	25.00	650.00	30.00	780.00	25.00	650.00
65D	42	each	Guard Posts	5.00	210.00	5.00	210.00	6.00	252.00
67B	100	c.y.	Loam Borrow	3.00	300.00	3.00	300.00	2.50	250.00
68	700	s.y.	Sodding	1.40	980.00	1.50	1,050.00	1.25	875.00
69	2	each	Project Markers	10.00	20.00	25.00	50.00	15.00	30.00
70	35	each	Right of Way Monuments	10.00	350.00	10.00	350.00	10.00	350.00
71	400	units	Sprinkling	6.00	2,400.00	4.00	1,600.00	5.00	2,000.00
72	1	each	Underdrain Outlet Marker	5.00	5.00	5.00	5.00	10.00	10.00
74	450	l.f.	Fencing	.40	180.00	.50	225.00	.50	225.00
75	20,000	yd.mi.	Gravel Overhaul	.10	2,000.00	.10	2,000.00	.10	2,000.00
76	60	l.f.	132" Multiplate Culvert Pipe	62.00	3,720.00	86.50	5,190.00	105.00	6,300.00
			TOTALS		123,457.50		128,476.25		129,944.50

A. P. Wyman, Inc. Waterville, Maine		Bridge Const. Corp. 341 Water Street Augusta, Maine		Wyman & Simpson, Inc. Augusta, Maine		Lee Brothers Albion, Maine		Engineer's Estimate	
Price	Amount	Price	Amount	Price	Amount	Price	Amount	Price	Amount
500.00	2,000.00	350.00	1,400.00	400.00	1,600.00	400.00	1,600.00	500.00	2,000.00
.70	7,700.00	1.75	19,250.00	1.00	11,000.00	.90	9,900.00	.85	9,350.00
5.00	31,500.00	1.76	11,088.00	4.50	28,350.00	5.00	31,500.00	4.00	25,200.00
.60	2,100.00	1.75	6,125.00	.80	2,800.00	.60	2,100.00	.70	2,450.00
25.00	450.00	40.00	720.00	30.00	540.00	40.00	720.00	40.00	720.00
.35	1,050.00	.25	750.00	.30	900.00	.20	600.00	.30	900.00
3.50	2,100.00	4.00	2,400.00	2.50	1,500.00	3.50	2,100.00	3.00	1,800.00
17.00	340.00	25.00	500.00	15.00	300.00	25.00	500.00	20.00	400.00
.69	24,150.00	.75	26,250.00	.70	24,500.00	.75	26,250.00	.70	24,500.00
.89	21,360.00	1.10	26,400.00	1.00	24,000.00	.90	21,600.00	1.15	27,600.00
2.75	4,895.00	3.00	5,340.00	3.00	5,340.00	3.50	6,230.00	2.30	276.00
.26	4,420.00	.21	3,570.00	.30	5,100.00	.28	4,760.00	3.00	5,340.00
4.15	7,055.00	3.50	5,950.00	3.00	5,100.00	3.50	5,950.00	.25	4,250.00
.22	7,480.00	.21	7,140.00	.30	10,200.00	.28	9,520.00	3.50	5,950.00
9.75	3,412.50	10.00	3,500.00	7.00	2,450.00	7.50	2,625.00	.25	8,500.00
								10.00	3,500.00
25.00	425.00	200.00	3,400.00	50.00	850.00	75.00	1,275.00		
								30.00	510.00
2.20	1,256.20	2.30	1,313.30	2.30	1,313.30	2.25	1,284.75		
2.75	418.00	2.75	418.00	2.70	410.40	3.25	494.00	2.50	1,427.50
3.65	2,379.80	3.75	2,445.00	4.00	2,608.00	4.00	2,608.00	3.00	456.00
5.50	803.00	5.00	730.00	5.50	803.00	5.50	803.00	4.00	2,608.00
7.00	483.00	6.50	448.50	7.50	517.50	7.00	483.00	5.50	803.00
25.00	1,625.00	22.00	1,430.00	26.00	1,690.00	22.00	1,430.00	7.50	517.50
8.00	96.00	8.00	96.00	9.00	108.00	20.00	240.00	35.00	2,275.00
14.00	532.00	13.00	494.00	14.00	532.00	20.00	760.00	7.20	86.40
10.00	30.00	14.73	44.19	10.00	30.00	20.00	60.00	13.00	494.00
7.00	210.00	5.00	150.00	5.00	150.00	10.00	300.00	7.00	21.00
10.00	200.00	10.00	200.00	7.00	140.00	10.00	200.00	4.00	120.00
1.75	525.00	2.00	600.00	2.00	600.00	2.00	600.00	10.00	200.00
1.50	60.00	1.50	60.00	1.00	40.00	1.50	60.00	2.00	600.00
								1.50	60.00
1.30	6,188.00	1.10	5,236.00	1.30	6,188.00	1.60	7,616.00		
30.00	780.00	25.00	650.00	30.00	780.00	30.00	780.00	1.20	5,712.00
6.00	252.00	6.00	252.00	6.00	252.00	6.00	252.00	25.00	650.00
3.00	300.00	4.00	400.00	3.00	300.00	3.00	300.00	6.00	252.00
1.50	1,050.00	1.50	1,050.00	1.50	1,050.00	1.50	1,050.00	3.00	300.00
10.00	20.00	10.00	20.00	20.00	40.00	20.00	40.00	1.50	1,050.00
10.00	350.00	10.00	350.00	10.00	350.00	10.00	350.00	15.00	30.00
5.00	2,000.00	4.00	1,600.00	6.00	2,400.00	5.00	2,000.00	10.00	350.00
5.00	5.00	5.00	5.00	10.00	10.00	20.00	20.00	5.00	2,000.00
.45	202.50	.50	225.00	.50	225.00	.60	270.00	7.00	7.00
.10	2,000.00	.10	2,000.00	.10	2,000.00	.10	2,000.00	.60	270.00
97.00	5,820.00	100.00	6,000.00	90.00	5,400.00	90.00	5,400.00	.10	2,000.00
								92.00	5,520.00
48,023.00			149,999.99		152,467.20		156,630.75		$151,055.40

A TRUE COPY: N. S. Waymouth
Engineer of Secondary Highways

ATTEST: Joseph W. Leavitt
Justice of the Peace

Plans

Survey field notes were plotted in the early part of 1953. Design work was carried on during the Winter months of 1953-54.

Design features consist of two eleven (11) foot travel lanes with six (6) foot wide shoulders on each side of the pavement. Vertical and horizontal sight distances allow for a fifty-five (55) mile per hour speed based on standards acceptable to the Bureau of Public Roads.

Preliminary plans were made available in August 1954.

Field Inspection

This phase of the work consists of walking over the entire project for the purpose of checking all details on the plans.

On September 2, 1954 a field inspection was made with representatives of the Bureau of Public Roads and the Maine State Highway Department. Many items and details were discussed resulting in recommended changes, with such changes being noted on the plans.

Engineer's Estimate

This type of estimate can only be obtained after plans are advanced to the final stages and actual quantities for the several items have been computed.

Plans are advanced to this stage upon completion of the field inspection.

The plans were revised at the Augusta office to conform with recommended changes made during the field inspection. Quantities were computed and an Engineer's estimate was made. This estimate was approximately $80,000 above the rough estimate.

A further study of the plans resulted in grade changes which in turn decreased the quantities of such items as Earth Excavation, Rock Excavation, and Common Borrow. With the above changes in effect, a revised Engineer's estimate was prepared showing a total cost for the project as follows:

Contract Roadway Items	$599,167.50
Moving Buildings	3,200.00

3. EASTON

Federal Aid Project No. F-051-1(3) Town of Easton

County of Aroostook - State of Maine

Project Description

This project is located on U.S. Route 1-A in the Town of Easton beginning about 0.35 miles north of the Mars Hill-Easton town line and extending northerly a distance of 5.739 miles to a point 0.17 miles south of the Easton-Fort Fairfield town line.

There are 3.316 miles of this project included in Project No. 5 of the Accelerated Highway Program and 2.423 miles included in Project No. 6 of the Accelerated Highway Program. (State Highway).

Program

The 1954-55 Federal Aid Primary Program was approved by the Maine State Highway Commission on April 6, 1954. Federal Aid Project F-051-1(3), Easton was included in this program as follows:

Town	Route	Mileage	Description	Federal Aid	State	Total
Easton	U.S. Alt. #1	6.00	From end of Federal Aid Project F-051-1(2) Northerly	$310,000	$340,000	$650,000

The above figures are the result of a rough estimate.

Design of the project was not complete upon submission of the above program, therefore, the 6.00 miles was an estimated length with the project terminating at the Easton-Fort Fairfield town line. Upon completion of the plans, it was found that a point where the new road would match the existing roadway, fell short of the Town Line by approximately 0.17 of a mile, this along with savings in distance due to line changes brought the length of the project to 5.74 miles.

Survey

A survey was made during the late summer and early fall of 1952. All data and information pertinent for the completion of plans was obtained.

Engineering and Contingencies		$58,832.50
Total		$661,200.00

Estimate Summary

Accelerated Highway Program	5.739 miles	$370,472.00
Rough Estimate (Program)	5.739 miles	$650,000.00
Engineers Estimate	5.739 miles	$661,200.00

- -

Bids Received December 8, 1954 - 5.739 miles Bituminous Concrete Road.

1. J. R. Cianchette	$531,762.00
2. H. E. Sargent, Inc.	$574,513.00
3. Bridge Construction Corp.	$609,983.00
4. Frank Rossi	$623,980.00

Note:

Ten (10) percent, for engineering and contingencies must be added to the above bids in order to compare them with the Engineer's estimate.

Example Bid #1 = $531,762.00

10% = 53,176.00

Total cost of Project $584,938.00

based on estimated quantities

at contract unit prices.

A contract for this project was executed between J. R. Cianchette and the Maine State Highway Commission.

Francis A. LeBlanc was assigned to the project as Resident Engineer.

Work Started on December 28, 1954

Conclusions

Minimum design standards, acceptable to the Bureau of Public Roads, were applied in designing this project. Meeting such standards resulted in

approval by the Bureau of Public Roads, for Federal participation. These standards are much higher than were required at the time the Accelerated Highway Program estimates were prepared. In addition to increased costs resulting from improved standards there has also been a rise in construction costs, right of way costs, and engineering costs.

In many areas throughout the State it has become necessary to process gravel base in order to provide a satisfactory foundation course. This is especially true in Aroostook County. Natural deposits of clean gravel are no longer available. This item alone reflects a great increase in construction costs.

In conclusion it is evident, at this time, that this section of highway could not be built to minimum safe standards for the amount of money set up in the Accelerated Highway Program.

The Engineer's estimate of Quantities with applied unit prices and also the unit prices applied by the respective bidders appear on the following page.

BIDS RECEIVED BY MAINE STATE HIGHWAY COMMISSION - December 8, 1954

F. A. Project No. F-051-1(3), "51" Easton - 5.739 Miles Bituminous Concrete Road

Item	Quantity	Unit	Description	J. R. Cianchetta, Pittsfield, Maine		H. E. Sargent, Inc. Stillwater, Maine		The Bridge Const. Corp. 341 Water Street, Augusta, Maine		Frank Rossi, R.F.D. 5-A, Gardiner, Maine		Engineer's Estimate	
				Price	Amount	Price	Amount	Price	Amount	Price	Amount	Price	Amount
201-5	6	Acres	Clearing	$400.00	$ 2,400.00	$ 350.00	$ 2,100.00	$ 400.00	$ 2,400.00	$ 500.00	$ 3,000.00	$500.00	$3,000.00
202-5	10	each	Removing Trees (9"-24")	35.00	350.00	30.00	300.00	40.00	400.00	50.00	500.00	30.00	300.00
202-6	5	"	Removing Trees (over 24")	100.00	500.00	100.00	500.00	150.00	750.00	200.00	1,000.00	200.00	1,000.00
203-9	60,000	c.y.	Earth Excavation	1.21	72,600.00	1.50	90,000.00	1.50	90,000.00	1.75	105,000.00	0.75	45,000.00
203-10	25,500	"	Rock Excavation	1.21	30,855.00	1.50	38,250.00	1.50	38,250.00	1.75	44,625.00	3.00	76,500.00
203-12	2,500	"	Muck Excavation	0.50	1,250.00	0.60	1,500.00	1.00	2,500.00	0.80	2,000.00	0.40	1,000.00
204-10	1,750	"	Struct. Earth Excav. - Drainage	2.20	3,850.00	2.20	3,850.00	10.00	17,500.00	3.00	5,250.00	3.00	5,250.00
204-11	2,500	"	Struct. Rock Excav. - Drainage	11.00	27,500.00	15.00	37,500.00	10.00	25,000.00	16.00	40,000.00	12.00	30,000.00
204-12	25	"	Struct. Earth Exc. - Abut. & Ret. Walls	3.00	75.00	2.20	55.00	8.00	200.00	5.00	125.00	5.00	125.00
205-8	40,000	"	Common Borrow	0.55	22,000.00	0.60	24,000.00	0.65	26,000.00	0.70	28,000.00	0.70	28,000.00
302-7	55,000	"	Gravel Base Course (In Place Meas.)	0.80	44,000.00	1.00	55,000.00	1.00	55,000.00	0.95	52,250.00	1.00	55,000.00
302-11	43,000	"	Washed Gr. Base Crs. (In Place Meas.)	1.65	70,950.00	1.50	64,500.00	1.90	81,700.00	1.70	73,100.00	2.00	86,000.00
308-5	477,900	y.m.	Overhaul (In Place Measure)	0.10	47,790.00	0.10	47,790.00	0.10	47,790.00	0.10	47,790.00	0.10	47,790.00
309-5	7,500	c.y.	Stripping Pits	0.25	1,875.00	0.30	2,250.00	0.30	2,250.00	0.30	2,250.00	0.35	2,625.00
310-6	500	units	Sprinkling	6.00	3,000.00	6.00	3,000.00	5.00	2,500.00	5.00	2,500.00	5.00	2,500.00
311-6	40	tons	Calcium Chloride	75.00	3,000.00	80.00	3,200.00	85.00	3,400.00	80.00	3,200.00	70.00	2,800.00
401-10	8,000	c.y.	Gravel Surface Course	2.50	20,000.00	3.00	24,000.00	3.00	24,000.00	3.00	24,000.00	3.00	24,000.00
404-28	11,000	tons	Bit. Conc. Surf. Crse., Crushed Gr.-Type A	8.00	88,000.00	8.00	88,000.00	8.50	93,500.00	8.25	90,750.00	9.00	99,000.00
501-7	56,000	gals.	Road Tar	0.30	16,800.00	0.28	15,680.00	0.30	16,800.00	0.30	16,800.00	0.30	16,800.00
601-11	420	l.f.	15" Corrugated Metal Pipe	2.60	1,092.00	2.80	1,176.00	3.00	1,260.00	2.50	1,050.00	2.75	1,155.00
601-12	1,050	"	18" " " "	2.90	3,045.00	3.20	3,360.00	3.40	3,570.00	3.50	3,675.00	3.25	3,412.50
601-14	610	"	24" " " "	4.50	2,745.00	4.50	2,745.00	5.00	3,050.00	5.00	3,050.00	3.75	2,287.50
602-12	70	"	18" Asphalt Coated Corr. Metal Pipe	4.00	280.00	3.50	245.00	3.80	266.00	3.75	262.50	3.75	262.50
602-14	730	"	24" " " " " "	5.00	3,650.00	5.40	3,942.00	5.50	4,015.00	6.00	4,380.00	5.50	4,015.00
602-15	90	"	30" " " " " "	6.50	585.00	7.00	630.00	7.00	630.00	7.25	652.50	7.00	630.00
602-16	120	"	36" " " " " "	9.75	1,170.00	10.00	1,200.00	11.00	1,320.00	11.00	1,320.00	11.00	1,320.00
602-18	65	"	48" " " " " "	17.00	1,105.00	16.00	1,040.00	16.50	1,072.50	16.00	1,040.00	15.00	975.00
602-21	75	"	72" " " " " "	36.00	2,700.00	35.00	2,625.00	38.00	2,850.00	39.00	2,925.00	40.00	3,000.00
603-13	810	"	24" Reinforced Concrete Pipe	7.00	5,670.00	5.50	4,455.00	7.50	6,075.00	7.50	6,075.00	7.00	5,670.00
603-14	100	"	30" " " "	8.75	875.00	8.50	850.00	11.00	1,100.00	11.00	1,100.00	9.00	900.00
603-15	150	"	36" " " "	13.50	2,025.00	11.00	1,650.00	15.00	2,250.00	17.00	2,550.00	12.00	1,800.00
603-17	100	"	48" " " "	21.00	2,100.00	18.00	1,800.00	24.00	2,400.00	25.50	2,550.00	20.00	2,000.00
605-16	3	each	Catch Basins, Type D	250.00	750.00	250.00	750.00	250.00	750.00	250.00	750.00	300.00	900.00
606-10	10,000	l.f.	Underdrain, Type B	1.80	18,000.00	2.00	20,000.00	2.00	20,000.00	1.90	19,000.00	1.75	17,500.00
606-16	1,000	"	Underdrain Outlets	1.50	1,500.00	1.00	1,000.00	1.00	1,000.00	1.50	1,500.00	1.25	1,250.00
707-13	48	c.y.	Coursed Dry Rubble Masonry	40.00	1,920.00	10.00	480.00	50.00	2,400.00	35.00	1,680.00	50.00	2,400.00
905-24	5,300	l.f.	Guard Rail - Type C	1.70	9,010.00	1.40	7,420.00	1.70	9,010.00	1.65	8,745.00	1.75	9,275.00
905-31	50	each	Anchorages for Type C Guard Rail	35.00	1,750.00	25.00	1,250.00	35.00	1,750.00	35.00	1,750.00	35.00	1,750.00
905-34	40	"	Guard Posts - Type A	7.00	280.00	5.00	200.00	7.50	300.00	6.00	240.00	6.00	240.00
906-17	700	l.f.	Fencing - Wood Posts	0.55	385.00	0.40	280.00	0.60	420.00	0.70	490.00	0.50	350.00
906-19	2	each	Barways - Wood Posts	25.00	50.00	35.00	70.00	35.00	70.00	30.00	60.00	25.00	50.00
908-8	800	c.y.	Loam Excavation	2.50	2,000.00	3.00	2,400.00	3.50	2,800.00	3.00	2,400.00	3.00	2,400.00
909-7	3,000	s.y.	Sodding	1.50	4,500.00	1.50	4,500.00	1.40	4,200.00	1.50	4,500.00	1.50	4,500.00
910-10	20	units	Seeding - Parkway Mixture	15.00	300.00	20.00	400.00	20.00	400.00	20.00	400.00	15.00	300.00
913-6	1	each	Project Markers	25.00	25.00	20.00	20.00	30.00	30.00	25.00	25.00	25.00	25.00
914-6	100	"	Right of Way Monuments	15.00	1,500.00	12.00	1,200.00	15.00	1,500.00	13.00	1,300.00	10.00	1,000.00
915-6	20	"	Undr. Outlet Markers	7.00	140.00	5.00	100.00	7.50	150.00	6.00	120.00	7.00	140.00
916-6	1,000	m.h.	Traffic Officers	1.50	1,500.00	1.25	1,250.00	1.50	1,500.00	1.50	1,500.00	1.50	1,500.00
917-9	800	l.f.	Plank Curb	0.60	480.00	0.60	480.00	0.75	600.00	1.00	800.00	0.50	400.00
918-7	100	"	Metal Sluice	4.00	400.00	3.00	300.00	5.00	500.00	3.50	350.00	3.50	350.00
919-1		l.s.	Moving Cabin, Sta. 374+15 Rt.	400.00	400.00	400.00	400.00	100.00	100.00	500.00	500.00	200.00	200.00
919-2		"	Moving Garage, Sta. 395+40 Rt.	350.00	350.00	500.00	500.00	150.00	150.00	500.00	500.00	300.00	300.00
919-3		"	Moving Shed, Sta. 421+55 Rt.	220.00	220.00	400.00	400.00	50.00	50.00	500.00	500.00	200.00	200.00
919-4		"	Moving Garage, Sta. 422+60 Lt.	275.00	275.00	500.00	500.00	200.00	200.00	500.00	500.00	300.00	300.00
919-5		"	Moving Garage, Sta. 461+50 Rt.	250.00	250.00	500.00	500.00	200.00	200.00	500.00	500.00	300.00	300.00
919-6		"	Moving Shed, Sta. 533+10 Rt.	175.00	175.00	400.00	400.00	100.00	100.00	500.00	500.00	200.00	200.00
919-7		"	Moving Shed, Sta. 552+75 Rt.	150.00	150.00	400.00	400.00	125.00	125.00	500.00	500.00	100.00	100.00
919-8		"	Moving House, Sta. 554+50 Rt.	600.00	600.00	600.00	600.00	1,000.00	1,000.00	500.00	500.00	600.00	600.00
919-9		"	Moving Shed and Hen Run, Sta. 584+50 Lt.	275.00	275.00	400.00	400.00	300.00	300.00	500.00	500.00	250.00	250.00
919-10		"	Moving Garage, Sta. 614+65 Lt.	300.00	300.00	500.00	500.00	200.00	200.00	500.00	500.00	750.00	750.00
920-1	60	l.f.	One (1) inch Copper Tubing	2.00	120.00	3.00	180.00	1.00	60.00	2.00	120.00	1.00	60.00
920-2	60	"	Two (2) Inch Galv. Steel Pipe	2.00	120.00	4.00	240.00	2.00	120.00	3.00	180.00	1.00	60.00
921-1		l.s.	Capping Spring, Sta. 535+10 Lt.	200.00	200.00	200.00	200.00	200.00	200.00	300.00	300.00	200.00	200.00
			Totals		$531,762.00		$574,513.00		$609,983.50		$623,980.00		$601,967.50

A trus copy,

Clinton P. Savage
Engineer of Primary Highways

Attest:

Clarence E. Hart
Justice of the Peace

4. RICHMOND-GARDINER PROJECT

Federal Aid Project No. FI- 1-2(1) Towns of Richmond and Gardiner, Counties of Sagadahoc and Kennebec, State of Maine

Project Description

This project begins about 1/4 mile north of Richmond Corner and extends northerly along U.S. Route 201 for a distance of 9.902 miles terminating at the urban line in Gardiner. There are 4.75 miles of this project listed as Project No. 1 Sagadahoc County Accelerated Highway Program (Primary) and 5.154 miles listed as Project No. 1 Kennebec County.

Program

A program including this project was submitted to the Bureau of Public Roads on March 10, 1952 for approval. The program was approved April 2, 1952 as follows:

Town & County		Route	Mileage	Description
Richmond	Sagadahoc)	U.S.201	9.91	From Federal Aid Project 1-B in Richmond Northerly to concrete pavement in Gardiner
Gardiner	Kennebec)			

Federal Funds	State Funds	Total
$495,000.00	$531,000.00	$1,026,000.00

The above figures are based on a rough estimate.

A further examination indicated a higher cost than that shown by the rough estimate, resulting in a request to the Bureau of Public Roads for a program change. Approval of this change was granted July 23, 1952, as follows:

Revised rough estimate:

Federal Funds	State Funds	Total
$680,000.00	$720,000.00	$1,400,000.00

Surveys

A survey was started November 1951 and completed in June, 1952. All field information and data pertinent for the completion of plans was obtained.

Plans

Development of plans started in March 1952 and were complete to the blueprint stage in July, 1952.

Design features consisted of two twelve (12) foot travel lanes with ten (10) foot wide shoulders on each side of the pavement. Vertical and horizontal sight distances allowed for a fifty-five (55) mile per hour speed. These standards were minimum requirements acceptable to the Bureau of Public Roads.

Field Inspection

A field inspection was made in July, 1952 with representatives of the Bureau of Public Roads and the State Highway Department present.

Design features and details were discussed resulting in changes being required by the Bureau of Public Roads.

Engineer's Estimate

Plans were revised to comply with new requirements of the Bureau of Public Roads and quantities were computed.

New design features included, among other things, three (3) truck lanes on steep grades for slow moving vehicles.

The Engineer's Estimate based upon the above revision is as follows:

Estimated contract cost	$1,292,757.85
Engineering and Contingencies	107,242.15
Estimated cost of Right of Way	40,000.00
	$1,440,000.00

Contractor's Bids

Bids received by State Highway Commission September 3, 1952.

Federal Aid Project FI-01-2(1), Richmond and Gardiner

9.902 Miles of Bituminous Concrete Road.

1. The Bridge Construction Corp.	$1,254,597.00
2. J. R. Cianchette	$1,263,235.80

3. W. H. Hinman, Inc.	$1,316,060.20
4. Thomas DiCenzo	$1,362,901.00

Note: The above bids may be compared with the Engineer's estimated contract cost of $1,292,757.85.

Contract Estimate based on estimated quantities and contract unit prices

Contract Roadway Items	$1,254,597.00
Engineering and Contingencies	107,242.15
Estimated cost of Right of Way	40,000.00
	$1,401,839.15

A contract for this project was executed between The Bridge Construction Corp. and the Maine State Highway Commission. Dana T. Bartlett was assigned to the project as Resident Engineer.

The contractor started working on the project September 16, 1952 and completed his contract November 20, 1953.

Estimate Summary

Accelerated Highway Program	9.91 Miles	$ 901,000.00
Rough Estimate (Program for F.A.)	9.91 "	1,026,000.00
Rough Estimate Revised (Program for F.A.)	9.91 "	1,400,000.00
Engineer's Estimate	9.902 "	1,440,000.00
Contract Estimate	9.902 "	1,401,839.15
Final Cost of Project	9.902 "	1,292,521.06

Breakdown of Final Cost of Project

Contract work (The Bridge Const. Corp.)	1,182,208.90
Engineering and Contingencies	58,850.53
Right of Way Cost	51,461.63
Total	$1,292,521.06

Conclusion

A 1951 traffic study for this section of highway provided the following information -- Average daily traffic of 2690 at the Richmond-Gardiner town line and 3100 vehicles at the Gardiner end of this project. Truck traffic represented twenty (20) percent of the above figures with ten (10) percent being classified as heavy.

A 1953 traffic count provided the following -- Average daily traffic at the Richmond-Gardiner town line 3200 and 5000 at the Gardiner end of the projects.

Minimum design standards, based on information obtained from the 1951 traffic study, and acceptable to the Bureau of Public Roads, were applied in the design of this project. Such standards were higher than those required at the time the Accelerated Highway Program estimates were prepared. In addition to increased costs resulting from improved standards there has also been a rise in construction costs, right of way costs, and engineering costs.

In conclusion it is evident that this section of highway could not be built to minimum safe standards for the amount of money set up in the Accelerated Highway Program.

A copy of the Engineer's Estimate of quantities with applied unit prices and also the unit prices of the respective bidders appears on the following page.

BIDS RECEIVED BY MAINE STATE HIGHWAY COMMISSION - Sept. 3, 1952

F. A. Project FI-01-2(1), "Q" Richmond & Gardiner - 9.902 Miles of Bituminous Concrete Road

Item	Quantity	Unit	Description	The Bridge Const.Corp. 341 Water St., Augusta, Maine Price	Amount	J. R. Cianchette, Pittsfield, Me. Price	Amount	W. H. Hinman, Inc., North Anson, Maine Price	Amount	Thomas DiCenzo, Calais, Me. Price	Amount	Engineer's Estimate Price	Amount
11	25	Acres	Clearing	$400.00	$10,000.00	$450.00	$11,250.00	$500.00	$12,500.00	$600.00	$15,000.00	$500.00	$12,500.00
12A	102,000	c.y.	Earth Excavation	1.00	102,000.00	1.69	172,380.00	1.20	122,400.00	1.80	183,600.00	0.80	81,600.00
12B	36,500	"	Rock Excavation	3.50	127,750.00	1.69	61,685.00	4.00	146,000.00	1.80	65,700.00	4.00	146,000.00
12D	3,100	"	Muck Excavation	0.70	2,170.00	0.78	2,418.00	0.90	2,790.00	0.90	2,790.00	0.40	1,240.00
12E	140	each	Trees Removed	50.00	7,000.00	50.00	7,000.00	50.00	7,000.00	50.00	7,000.00	40.00	5,600.00
12G	8,000	c.y.	Stripping Pits	0.30	2,400.00	0.25	2,000.00	0.35	2,800.00	0.50	4,000.00	0.25	2,000.00
13	6,000	"	Exc. for Struct.	3.00	18,000.00	3.00	18,000.00	3.00	18,000.00	3.00	18,000.00	2.50	15,000.00
13B	500	"	Rock Exc.for Struct.	20.00	10,000.00	18.00	9,000.00	20.00	10,000.00	25.00	12,500.00	15.00	7,500.00
17A	92,000	"	Common Borrow	0.80	73,600.00	0.78	71,760.00	0.90	82,800.00	0.80	73,600.00	0.75	69,000.00
19	10,100	"	Gravel Shoulder	1.50	15,150.00	1.65	16,665.00	1.50	15,150.00	2.50	25,250.00	1.75	17,675.00
24A	145,000	"	Gr. Base Course	1.05	152,250.00	1.20	174,000.00	1.20	174,000.00	1.25	181,250.00	1.05	152,250.00
26A	49,000	tons	Crushed St.Base Crse.	5.00	245,000.00	5.30	259,700.00	5.00	245,000.00	5.50	269,500.00	6.00	294,000.00
26B	344,000	gals.	Asphalt Cement	0.20	68,800.00	0.18	61,920.00	0.20	68,800.00	0.19	65,360.00	0.22	75,680.00
32	300	c.y.	Gr. Surf. Course	5.00	1,500.00	3.50	1,050.00	3.00	900.00	3.00	900.00	1.75	525.00
33A	200	"	Surf. Tr. Gr. Course	6.00	1,200.00	3.50	700.00	3.00	600.00	3.00	600.00	3.00	600.00
33B	17,000	gals.	Bit. Material	0.30	5,100.00	0.23	3,910.00	0.29	4,930.00	0.25	4,250.00	0.27	4,590.00
37A	21,000	tons	Bit.Conc.Surf.Crse.	8.50	178,500.00	8.10	170,100.00	9.00	189,000.00	9.50	199,500.00	9.00	189,000.00
42A	34	c.y.	Class "A" Conc.	70.00	2,380.00	64.00	2,176.00	60.00	2,040.00	60.00	2,040.00	65.00	2,210.00
42B	270	"	Class "B" Concrete	65.00	17,550.00	60.00	16,200.00	50.00	13,500.00	70.00	18,900.00	60.00	16,200.00
43	5,800	lbs.	Stl.Reinf.for Conc.Struct.	0.20	1,160.00	0.12	696.00	0.15	870.00	0.17	986.00	0.15	870.00
45	75	c.y.	Cement Rubble Masonry	50.00	3,750.00	18.00	1,350.00	25.00	1,875.00	30.00	2,250.00	40.00	3,000.00
47C	100	l.f.	12" Corr. Metal Pipe	2.50	250.00	2.10	210.00	2.50	250.00	2.50	250.00	2.50	250.00
47D	1,920	"	15" " " "	3.00	5,760.00	2.50	4,800.00	3.00	5,760.00	3.00	5,760.00	3.00	5,760.00
47E	711	"	18" " " "	3.25	2,310.75	3.00	2,133.00	3.50	2,488.50	3.50	2,488.50	3.50	2,488.50
47F	62	"	21" " " "	3.75	232.50	4.00	248.00	4.25	263.50	4.00	248.00	4.25	263.50
47G	27	"	24" " " "	4.50	121.50	5.50	148.50	5.00	135.00	5.00	135.00	4.75	128.25
47R	250	"	Relaying C.M.P.	2.00	500.00	1.50	375.00	2.00	500.00	2.00	500.00	1.25	312.50
48A	168	"	8" A.C.O.M.P.	2.50	420.00	2.10	352.80	2.25	378.00	2.50	420.00	2.25	378.00
48D	245	"	15" " "	3.25	796.25	3.00	735.00	3.50	857.50	3.50	857.50	3.50	857.50
48E	446	"	18" " "	4.00	1,784.00	3.75	1,672.50	4.20	1,873.20	4.00	1,784.00	4.00	1,784.00
48G	348	"	24" " "	5.50	1,914.00	5.50	1,914.00	5.50	1,914.00	5.50	1,914.00	6.00	2,088.00
48H	108	"	30" " "	7.50	810.00	7.00	756.00	6.50	702.00	6.75	729.00	8.00	864.00
48-I	28	"	36" " "	11.00	308.00	10.75	301.00	10.00	280.00	10.00	280.00	10.00	280.00
48J	17	"	42" " "	12.00	204.00	13.00	221.00	12.50	212.50	12.00	204.00	12.00	204.00
50B	52	"	15" Reinf.Conc. Pipe	3.50	182.00	3.50	182.00	4.00	208.00	3.00	156.00	3.30	171.60
50C	724	"	18" " " "	4.50	3,258.00	4.25	3,077.00	4.50	3,258.00	4.00	2,896.00	4.50	3,258.00
50D	92	"	24" " " "	7.00	644.00	6.50	598.00	6.50	598.00	5.50	506.00	6.50	598.00
50E	152	"	30" " " "	9.50	1,444.00	8.50	1,292.00	9.00	1,368.00	7.50	1,140.00	8.50	1,292.00
50F	160	"	36" " " "	12.00	1,920.00	9.75	1,560.00	12.00	1,920.00	9.50	1,520.00	12.00	1,920.00
50G	68	"	42" " " "	14.00	952.00	13.00	884.00	12.00	816.00	12.00	816.00	15.00	1,020.00
51A	100	"	6" Vitrified Clay Pipe	2.00	200.00	0.80	80.00	2.00	200.00	1.00	100.00	2.00	200.00
51B	100	"	8" " " "	2.00	200.00	1.00	100.00	3.00	300.00	1.50	150.00	2.25	225.00
51D	100	"	12" " " "	2.50	250.00	1.50	150.00	4.00	400.00	2.00	200.00	2.50	250.00
52A	1	each	Drop Inlet - Type A	250.00	250.00	250.00	250.00	220.00	220.00	250.00	250.00	200.00	200.00
52B	9	"	Drop Inlet - Type B	250.00	2,250.00	250.00	2,250.00	220.00	1,980.00	250.00	2,250.00	225.00	2,025.00
520	1	"	Catch Basin - Type A	200.00	200.00	350.00	350.00	300.00	300.00	250.00	250.00	250.00	250.00
54	200	c.y.	Hand-Laid Riprap	10.00	2,000.00	10.00	2,000.00	7.00	1,400.00	10.00	2,000.00	6.00	1,200.00
55A	400	l.f.	Underdrain - Type A	2.00	800.00	1.50	600.00	2.00	800.00	2.00	800.00	1.30	520.00
55B	11,200	"	Underdrain - Type B	2.50	28,000.00	1.90	21,280.00	2.30	25,760.00	2.00	22,400.00	1.90	21,280.00
55C	1,200	"	Underdrain Outlets	1.50	1,800.00	1.25	1,500.00	2.00	2,400.00	2.00	2,400.00	1.50	1,800.00
57	400	"	Slope Checks	1.00	400.00	0.50	200.00	0.35	140.00	1.00	400.00	0.60	240.00
58	3,500	"	Plank Curb	0.50	1,750.00	0.75	2,625.00	0.60	2,100.00	1.00	3,500.00	0.80	2,800.00
60	350	"	Metal Sluice	5.00	1,750.00	3.00	1,050.00	3.00	1,050.00	3.50	1,225.00	3.60	1,260.00
65B	21,000	"	Wire Cable Gde Rail-Type B	1.75	36,750.00	1.65	34,650.00	1.60	33,600.00	2.00	42,000.00	1.65	34,650.00
65C	156	each	Anchorages	30.00	4,680.00	26.00	4,056.00	25.00	3,900.00	35.00	5,460.00	25.00	3,900.00
65D	200	"	Guard Posts	7.00	1,400.00	7.00	1,400.00	5.00	1,000.00	6.00	1,200.00	4.00	800.00
67A	400	c.y.	Loam Excavation	3.00	1,200.00	2.50	1,000.00	3.00	1,200.00	3.00	1,200.00	3.00	1,200.00
67B	1,700	"	Loam Borrow	3.00	5,100.00	3.00	5,100.00	3.50	5,950.00	3.00	5,100.00	3.00	5,100.00
68	20,000	s.y.	Sodding	1.50	30,000.00	1.65	33,000.00	1.30	26,000.00	1.50	30,000.00	1.50	30,000.00
69	2	each	Project Markers	30.00	60.00	30.00	60.00	30.00	60.00	20.00	40.00	20.00	40.00
70	115	"	Right of Way Monuments	12.00	1,380.00	10.00	1,150.00	10.00	1,150.00	10.00	1,150.00	9.00	1,035.00
71	200	units	Sprinkling	6.00	1,200.00	8.00	1,600.00	6.00	1,200.00	6.00	1,200.00	8.00	1,600.00
72	16	each	Undr. Outlet Markers	6.00	96.00	10.00	160.00	8.00	128.00	6.00	96.00	5.00	80.00
73	3,500	m.h.	Traffic Officers	1.50	5,250.00	1.50	5,250.00	1.00	3,500.00	1.50	5,250.00	1.25	4,375.00
74	13,000	l.f.	Fencing	0.60	7,800.00	0.60	7,800.00	0.50	6,500.00	0.70	9,100.00	0.55	7,150.00
75	400,000	y.m.	Gravel Overhaul	0.10	40,000.00	0.10	40,000.00	0.10	40,000.00	0.10	40,000.00	0.10	40,000.00
76	30	tons	Calcium Chloride	80.00	2,400.00	90.00	2,700.00	110.00	3,300.00	100.00	3,000.00	90.00	2,700.00
77	850	l.f.	Granite Edging	6.00	5,100.00	3.50	2,975.00	4.50	3,825.00	4.00	3,400.00	4.00	3,400.00
78	12	tons	Hay Mulch	80.00	960.00	90.00	1,080.00	80.00	960.00	100.00	1,200.00	70.00	840.00
80	60	each	Culvert Connections	30.00	1,800.00	50.00	3,000.00	25.00	1,500.00	25.00	1,500.00	30.00	1,800.00
81	10	"	Removing Drop Inlets	50.00	500.00	40.00	400.00	50.00	500.00	50.00	500.00	25.00	250.00
					$1,254,597.00		$1,263,235.80		$1,316,060.20		$1,362,901.00		$1,292,757.85

A true copy,

R. M. Page
Asst. Highway Engineer

Attest,

E. W. Axtell
Justice of the Peace

F. CONCLUSIONS REGARDING THE ACCELERATED PROGRAM

1. Costs and a Summary of the Program

The Accelerated Program contemplated the reconstruction of 1,600 miles of roads, including bridges at an average estimated cost of $52,790 per mile, or about $85,000,000. Actual experience has shown that the average cost, including bridges has in fact been $94,390 per mile.

As of June 30, 1955, construction contracts will have been awarded for 480 miles, at an estimated total cost of $36,700,000, which includes bridges but does not include Urban projects.

The construction program for the fiscal year 1955-1956, as announced on December 23, 1954, will add approximately 105 miles, making a total of about 585 miles. The $15,000,000, which is to be expended for the fiscal year 1955-1956, includes Federal-Urban projects, the acquisition of right of way for a future project and a major bridge. The estimates for these projects total $3,975,000. No mileage credit can be taken for these projects under the Accelerated Program. Removing the scheduled surfacing projects from the list, mileage credit for which has been taken, leaves the total of 105 miles of new construction schedules for the fiscal year. The $11,025,000 remaining, after the non-mileage producing projects have been deducted from the $15,000,000 spread over the 105 miles, gives us an average cost of $105,000 per mile, including bridges, provided present economic conditions remain in effect. The program expenditures for the second year of the biennium will be essentially the same as for the first.

2. The $27,000,000 Bond Issue

The original schedule called for the issuance of bonds as follows: $4,000,000 annually for each of the six years 1953 through 1958 and $3,000,000 in 1959. The bonds were actually issued as follows: $4,000,000 on August 1, 1952 and $23,000,000 on April 1, 1953. The original schedule called for the

bonds to be retired as follows: $2,500,000 annually for each of the six years, 1960 through 1965; $1,800,000 in 1966, $3,200,000 in 1969 and $3,500,000 in each of the years 1970 and 1971. The retirement schedule now calls for the bonds to be retired as follows: 1954 through 1957, 4 years @ $1,000,000; 1958 $2,500,000 1960 $3,500,000; 1961 $4,000,000; 1962 and 1963, 2 years at $2,500,000; 1964 $3,000,000; 1965 $2,500,000; 1966 $2,000,000; and 1967 $500,000. This revised schedule shows that $1,000,000 has already been retired, that a total of $4,000,000 will have been retired in five years of the program and that a total of $6,500,000 will have been retired in seven years, where originally, none of the bonds were to have been retired in this period. This, in effect, allowed the use of $20,500,000 of bond issue funds during the program period.

The proceeds of the $27,000,000 bond issue have been authorized as follows:

Bond Issue		$27,000,000.00
Miscellaneous Income		6,785.01
Total Available		$27,006,785.01

Transfers authorized by Governor and Council

Fiscal Year 1952-'53	$8,941,353.92	
Fiscal Year 1953-'54	6,788,745.46	
Fiscal Year 1954-'55	3,520,500.00	
Total Transfers		$19,250,599.38
Balance as of December 31, 1954		$ 7,756,185.63

Transfers to be authorized according to Governor's Budget:

Fiscal Year 1955-'56	$5,500,000.00	
Fiscal Year 1956-'57	2,256,185.00	
Total		$ 7,756,185.00
Estimated Balance June 30, 1957		$ .63

The above authorizations are approved at the beginning of each fiscal year by the Governor and Council and funds are transferred to construction operating accounts. Transfers from current revenue are also authorized by the Governor and Council to these same accounts. Expenditure records for specific projects are maintained showing the Federal and State share of the cost. No segregation is made between bond funds and current revenue on each project. However, the transfers mentioned above do result in the segregation of bond funds and current revenue in total.

3. Construction and the Federal Program

Before the program was started it was agreed to try to hold to the schedule of one-seventh of the mileage each year. This meant a total of nearly 230 miles each year. At the end of the first year this figure was exceeded slightly; at the end of $1\frac{1}{2}$ years, 331 miles had been completed or placed under construction; at the end of 2 years, 420 miles, and at the end of $2\frac{1}{2}$ years, or on December 31, 1954, 465 miles. In January, 1954, it was found that Federal Allocations were to be increased from $4,300,000 to $6,700,000 annually, effective July 1, 1955. It was apparent that State funds should be conserved to match Federal Allocations. Consequently the 1954 program was revised, removing approximately $4,000,000 of State projects. This will permit the continuation of the policy of taking up all Federal funds. No Federal funds have been allowed to lapse under the Accelerated Program.

Previous to this increase in Federal Allocations the Joint Federal Construction Fund amounted to approximately $9,000,000 leaving $6,000,000 for State projects under a $15,000,000 program. After the revision, the joint Federal Construction fund totalled approximately $14,000,000 leaving only $1,000,000 for State work.

4. Priorities for Construction Projects.

An item that has caused confusion in the Accelerated Program was the rather liberal use of the word "Priorities". The item numbers used in the report should more properly have been labeled "Identification Numbers". An example of the misuse of the word "Priorities" is on the page showing Washington County on the State Highway System. There, the numbers start at the Hancock County line and run nearly consecutively to the Aroostook County line. Obviously there are projects in the central portions of this route that should be taken care of first, and have been so scheduled for construction. (Illustration: Edmunds-Dennysville Project - now under construction)

On February 4, 1953 the 96th Legislature under a House Order directed the State Highway Commission to furnish "a listing within each county of the order of priority for the construction projects described in the 1951 Accelerated Highway Program". Under date of March 26, 1953, the State Highway Commission replied to this order. The following is an excerpt from that reply:

> "On account of changing conditions, some beyond the control of the Commission, involving approvals, right-of-way problems, and conditions and needs which have required the application of our best judgment in order to serve, in our opinion, the best interests of the State, we have found it impossible to follow in all respects the order of priority as set forth in the program.
>
> After due consideration of the order of February 4, 1953, we beg leave to submit the same listings of projects for each county as shown in the Accelerated Highway Program of 1951."

This communication was signed by the then members of the State Highway Commission. The communication above was read and ordered placed on file.

By experience with the Accelerated Highway Program, it has been learned that to attempt to establish priorities beyond a two-year period is not feasible. There must be elasticity in timing to take care of constantly changing conditions. Based on this experience, the construction program for the next biennium was compiled.

G. Statement

Experience with the Accelerated Program indicates that it is a satisfactory guide for the selection of the location of construction projects. However, changing traffic conditions, revised design standards and deterioration of roads not included in the original program make it necessary to consider additions to that program. A report listing these additions will be prepared for the next Legislature. It should be emphasized that the sections included in the current Accelerated Program, not yet scheduled for construction will still be considered for the allocation of construction funds in the future.

Contained in the above mentioned report will be sufficient information to permit an evaluation of the State Highway System by the 98th Legislature. Such an evaluation may result in additions and deletions in mileage.

If any additional information is required, the Department will endeavor to supply such information upon request.

APPENDIX

LISTING OF THE PORTIONS OF THE ACCELERATED HIGHWAY PROGRAM, COMPLETED OR UNDER CONSTRUCTION AS OF DECEMBER 31, 1954.

BY COUNTIES

Showing in detail

(a) Accelerated Highway Program Number

(b) Location

(c) Length in miles

(d) Expenditures 7/1/52 to 12/31/54.

(e) County Sub-Totals - State Highway System

(f) County Sub-Totals - State Aid on Federal System

(g) County Totals

(h) Grand Totals

NOTE:

Expenditures shown are the actual costs to December 31, 1954 including construction, engineering and right of way. Expenditures do not represent total costs where the projects were not completed by December 31, 1954.

Projects marked (*) in the "expenditure" column were those projects that were completed just prior to July 1, 1952. Because these sections of highway were shown in the Accelerated Highway Program it was necessary to include the mileage.

ANDROSCOGGIN COUNTY

State Highway

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
1	Lewiston-Lisbon	2.54	$221,189.40
3	Lewiston	2.97	122,911.09
7	Auburn	Bridge	27,119.46
PRELIMINARY ENGINEERING			5,707.88
Sub-total (S. H.)		5.51	$376,927.83

State Aid, on Federal System

1	Minot	1.07	$ 91,042.06
2	Durham	1.40	25,592.41
5	Mechanic Falls	Bridge	39,373.92
6	Lisbon	Bridge	6,775.42
PRELIMINARY ENGINEERING			2,682.79
Sub-total (S. A.)		2.47	$165,466.60
ANDROSCOGGIN COUNTY TOTALS		7.98	$542,394.43

AROOSTOOK COUNTY

State Highway

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
1	Molunkus-Macwahoc - T-1-R-4	9.22	$259,677.62
2	Haynesville- T-3-R-2- Reed Pl. -Glenwood	21.51	202,243.12
3	Presque Isle	5.87	561.903.11
4	Caribou	0.14	*
5	Mars Hill-Easton	6.83	757,028.23
7	Cary Pl. -Houlton- Hodgdon	7.98	196,399.52
8	Amity-Cary Pl.	1.99	47,992.36
10	Van Buren	2.75	2,624.28
11	Grand Isle-Madawas- ka.	5.42	421,053.06
12	Frenchville- Ft. Kent	17.17	362,570.57
13	Linneus-Houlton	2.04	226,090.17
14	Reed Pl.	Bridge	22,235.51
20	Caribou	3.52	* *
21	Smyrna	0.22	8,336.33
22	Mapleton	4.96	153,465.81
23	Caribou-Woodland- New Sweden	9.75	685,785.98
25	Presque Isle	0.57	*
33	T-11-R-4	0.28	*
34	Limestone	0.15	*

AROOSTOOK COUNTY (Cont'd)

State Highway (Cont'd)

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54.
39	Sherman	1.59	$ 48,855.77
40	Washburn	2.80	2,825.65
42	Smyrna	3.11	117,975.93
44	Fort Kent	0.13	*
45	Washburn	0.89	66,297.18
47	T-17-R-4	1.15	*
52	Sherman	6.00	187,381.69
56	Eagle Lake	0.50	*
59	Hamlin	0.88	*
60	T-14-R-6	0.36	*
68	Macwahoc	2.63	70,907.15
69	T-1-R-4	1.00	27,698.26
70	Silver Ridge	5.06	155,461.37
PRELIMINARY ENGINEERING			59,830.84
Sub-total (S. H.)		126.47	$4,644,639.51
AROOSTOOK COUNTY TOTALS		126.47	$4,644,639.51

** Constructed with Federal Access Road Funds.

CUMBERLAND COUNTY

State Highway

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52-12/31/54
1	Bridgton	3.00	$128,678.76
7	Freeport-Yarmouth	3.10	953,430.17
8	Standish	3.45	84,569.95
9	Bridgton	0.77	*
10	Cumberland	0.50	27,147.62
13	Yarmouth	0.91	279,843.62
14	Freeport	3.67	149,394.47
PRELIMINARY ENGINEERING			130,067.23
Sub-total (S.H.)		15.40	$1,753,131.82

State Aid on Federal System

1	Scarboro	3.90	114,613.03
4	Windham	2.80	291,451.79
6	Standish	0.31	*
PRELIMINARY ENGINEERING			11,540.90
Sub-total (S. A.)		7.01	$417,605.72
CUMBERLAND COUNTY TOTALS		22.41	$2,170,737.54

FRANKLIN COUNTY

State Highway

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
2.	Strong	4.45	$439,445.99
3	Sandy River Pl. - Rangeley	3.36	343,136.42
5	Farmington	0.55	41,768.61
7	Rangeley	0.79	32,094.44
PRELIMINARY ENGINEERING			40,168.24
Sub-total (S. H.)		9.15	$896,613.70

State Aid on Federal System

1	Farmington	0.49	*
7	New Vineyard	5.00	365,398.40
11	Perkins Twp.	Bridge	11,501.44
PRELIMINARY ENGINEERING			11,278.30
Sub-total (S. A.)		5.49	$388,178.14
FRANKLIN COUNTY TOTALS		14.64	$1,284,791.84

HANCOCK COUNTY

State Highway

1	Gouldsboro	2.18	$ 84,843.71
2	Sullivan	2.61	144,253.37
10	Ellsworth	0.10	*
12	Southwest Harbor	0.34	25,583.84
PRELIMINARY ENGINEERING			8,767.50
Sub-total (S. H.)		5.23	$263,448.42

HANCOCK COUNTY (Cont'd)

State Aid on Federal System

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
1	Bar Harbor	0.80	*
5	Franklin	2.20	122,445.89
10	Mount Desert	Bridge	5,231.84
PRELIMINARY ENGINEERING Sub-total (S. A.)		3.00	11,074.28 $138,752.01
HANCOCK COUNTY TOTALS		8.23	$402,200.43

KENNEBEC COUNTY

State Highway

1	Gardiner	5.16	$673,557.37
3	Belgrade	3.13	190,878.89
5	Augusta	4.70	251,984.53
9	Augusta	2.04	19,816.31
10	Winthrop	0.47	*
12	Winslow	2.65	85,888.27
13	Hallowell	1.52	23,202.74
16	Augusta	2.13	18,853.14
19	Winthrop	1.11	96,749.45
21	Pittston	1.47	58,821.19
23	Albion	1.00	*
24	Winslow	0.24	17,580.03
25	Winslow	4.63	191,544.80
26	China	0.20	390.93
PRELIMINARY ENGINEERING Sub-total (S. H.)		30.45	61,089.93 $1,690,357.58

KENNEBEC COUNTY (Cont'd)

State Aid on Federal System

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
6	Chelsea	0.19	$ 12,512.02
8	Winslow	0.50	28,441.96
9	Oakland	4.70	324,799.71
10	Readfield	4.40	256,098.52
11	Monmouth	0.17	*
12	Winthrop-Wayne	2.09	358,424.67
13	Vassalboro	3.30	187,763.46
PRELIMINARY ENGINEERING			602.63
Sub-total (S. A.)		15.35	$1,168,642.97
KENNEBEC COUNTY TOTALS		45.80	$2,859,000.55

KNOX COUNTY

State Highway

4	Rockland	1.43	$ 69,978.00
PRELIMINARY ENGINEERING			8,137.52
Sub-total (S. H.)		1.43	$ 78,115.52

State Aid On Federal System

2	Waldoboro-Friendship	Bridge	$ 15,669.27
PRELIMINARY ENGINEERING			16.30
Sub-total (S. A.)		--	$ 15,685.57
KNOX COUNTY TOTALS		1.43	$ 93,801.09

LINCOLN COUNTY

State Highway

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
1	Damariscotta	0.13 (1)	$323,929.84
2	Newcastle	0.20 (1)	83,304.87
3	Edgecomb	3.65	66,742.46
4	Wiscasset	2.00	75,321.15
Sub-total (S.H.)		5.98	$549,298.32

(1) Includes Bridge.

State Aid on Federal System

2	Bristol	1.10	$ 88,223.36
4	Waldoboro	1.88	154,987.11
7	Bristol	2.56	193,639.95
PRELIMINARY ENGINEERING			9,042.50
Sub-total (S. A.)		5.54	$445,892.92
LINCOLN COUNTY TOTALS		11.52	$995,191.24

OXFORD COUNTY

State Highway

1	Woodstock	0.71	$ 64,710.36
2	Bethel	2.28	100,256.98
3	Rumford	1.55	209,738.25
7	Rumford	0.81	*
8	Rumford	5.15	42,234.32
11	Bethel	0.18 (1)	35,968.24
12	Gilead	7.82 (1)	324,220.54
17	Paris	0.04	67.72

OXFORD COUNTY (Cont'd)

State Highway (Cont'd)

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
18	Fryeburg	3.74	$216,979.66
PRELIMINARY ENGINEERING			33,697.20
Sub-totals (S. H.)		22.28	$1,027,873.27

State Aid on Federal System

2	Dixfield	0.26	*
PRELIMINARY ENGINEERING			11,932.25
Sub-total (S. A.)		0.26	$ 11,932.25
OXFORD COUNTY TOTALS		22.54	$1,039,805.52

PENOBSCOT COUNTY

State Highway

1	Newport	0.62	$ 89,027.68
2	Passadumkeag-Enfield	4.62	522,197.62
5	Mattawamkeag	3.06	111,460.57
6	Orono-Old Town	2.25	343,651.60
7	Corinna	0.79	41,848.66
8	Glenburn	0.06	10,699.48
11	Bangor	3.85	169,655.91
16	Millinocket-TA-R7	4.58	222,231.69
PRELIMINARY ENGINEERING			22,648.22
Sub-total (S. H.)		19.83	$1,533,421.43

PENOBSCOT COUNTY (Cont'd)

State Aid on Federal System

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
3	Lincoln	4.10	$103,705.48
5	Enfield	0.62	*
6	Lee	0.25	*
10	Eddington	0.31	*
12	Levant	Bridge	35,909.02
PRELIMINARY ENGINEERING			3,545.08
Sub-total (S. A.)		5.28	$143,159.58
PENOBSCOT COUNTY TOTALS		25.11	$1,676,581.01

PISCATAQUIS COUNTY

State Highway

3	Shirley	1.81	*
6	Dover-Foxcroft-Sebec	3.71	$236,403.39
10	Brownville	0.42	24,946.97
12	Greenville	0.12	5,284.07
17	Guilford	Bridge	150,470.56
PRELIMINARY ENGINEERING			22,097.17
Sub-total (S. H.)		6.06	$439,202.16

State Aid on Federal System

PRELIMINARY ENGINEERING		$ 1.19
Sub-total (S. A.)	--	$ 1.19
PISCATAQUIS COUNTY TOTALS	6.06	$439,203.35

SAGADAHOC COUNTY

State Highway

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
1	Richmond	4.75	$621,247.27
3	Topsham	0.14	18,561.28
7	Bath	0.25	5,122.58
PRELIMINARY ENGINEERING			$11,023.52
Sub-total (S. H.)		5.14	$655,954.65

State Aid on Federal System

2	Woolwich	0.40	*
3	Phippsburg	3.16	$237,634.91
5	Arrowsic	0.68	14,107.62
PRELIMINARY ENGINEERING			(1,138.22)
Sub-total (S. A.)		4.24	$250,604.31
SAGADAHOC COUNTY TOTALS		9.38	$906,558.96

SOMERSET COUNTY

State Highway

1	Palmyra	2.22	$318,794.87
2	Madison-Solon	9.46	756,369.76
3	Bingham-Moscow-Caratunk	12.96	558,387.83
9	Skowhegan-Norridgewock	4.36	422,115.95
17	Johnson Mt. - Parlin Pond	5.31	297,591.67

SOMERSET COUNTY (Cont'd)

State Highway (Cont'd)

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
18	The Forks-W. Forks	8.01	$156,434.36
19	Jackman-Moose River	5.56	347,930.89
20	Dennistown-Sandy Bay	5.15	232,674.55
23	Embden	Bridge	236,026.25
25	Fairfield	Bridge	32,561.63
27	Embden	Bridge	16,205.79
34	Madison	2.00	127,029.96
PRELIMINARY ENGINEERING			10,087.49
Sub-total (S.H.)		55.03	$3,512,211.00

State Aid on Federal System

2	Smithfield	0.79	$ 54,594.88
PRELIMINARY ENGINEERING			2,665.96
Sub-total (S.A.)		0.79	$ 57,260.84
SOMERSET COUNTY TOTALS		55.82	$3,569,471.84

WALDO COUNTY

State Highway

1	Belfast-Searsport	4.26	$103,248.27
5	Northport	6.58	597,791.03
8	Prospect	0.07	*
10	Belfast	2.45	206,061.73
11	Waldo	0.99	19,398.30

WALDO COUNTY (Cont'd)

State Highway (Cont'd)

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
PRELIMINARY ENGINEERING			$ 2,278.76
Sub-total (S. H.)		14.35	$928,778.09

State Aid on Federal System

1	Belfast	3.60	$224,790.04
2	Unity	5.40	202,080.04
3	Unity	0.70	27,150.40
4	Troy	4.60	321,904.45
5	Belfast	Bridge	4,186.79
Sub-totals (S. A.)		14.30	$780,111.72
WALDO COUNTY TOTALS		28.65	$1,708,889.81

WASHINGTON COUNTY

State Highway

2	Milbridge-Cherryfield	4.77	$283,835.81
3	Harrington-Columbia-Columbia Falls	5.86	531,031.36
4	Jonesboro	2.67	252,128.69
7	Edmunds-Dennysville	5.89	15,689.54
8	Pembroke	2.65	4,231.57
9	Perry	0.87	2,788.74
10	Robbinston	0.19	28,286.85

WASHINGTON COUNTY (Cont'd)

State Highway (Cont'd)

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
11	Eastport	0.32	$ 42,690.85
12	Baileyville	0.02	811.93
13	Princeton	5.10	207,377.89
14	Indian Twp.	3.94	52,465.80
15	Waite-Talmadge	6.37	132,496.31
16	Topsfield	2.22	40,820.35
20	Trescott-Lubec	4.03	165,028.87
PRELIMINARY ENGINEERING			48,228.04
Sub-total (S. H.)		44.90	$1,807,912.60

State Aid on Federal System

1	Cherryfield	2.99	$ 72,362.83
3	Marshfield	0.90	*
4	Northfield	0.85	*
Sub-total (S. A.)		4.74	$ 72,362.83
WASHINGTON COUNTY TOTALS		49.64	$1,880,275.43

YORK COUNTY

State Highway

Accelerated Program No.	Location	Mileage	Expenditures 7/1/52 - 12/31/54
1	Lebanon	7.99	$471,438.14
3	Wells-No. Berwick	6.08	617,505.43
5	Cornish	Bridge	415.68
9	Kittery-York	4.85	92,924.11
10	Kennebunk	0.06	1,271.70
19	Alfred	0.29	*
20	Eliot	0.20	7,508.32
24	No. Berwick	1.86	81,230.37
30	Shapleigh	0.69	43,814.73
37	Alfred	Bridge	18,987.57
PRELIMINARY ENGINEERING			22,545.19
Sub-total (S. H.)		22.02	$1,357,641.24

State Aid on Federal System

5	Dayton-Hollis	Bridge	$ 25,101.43
6	Limerick-Limington	7.09	388,617.59
8	Dayton	Bridge	21,889.01
Sub-total (S. A.)		7.09	$435,608.03
YORK COUNTY TOTALS		29.11	$1,793,249.27

SUMMARY

STATE HIGHWAYS	389.23	$21,515,527.14
STATE AID (F. A. S.)	75.56	4,491,264.68
GRAND TOTALS	464.79	$26,006,791.82