URBAN STREETS AND HIGHWAYS

REPORT OF THE

VIRGINIA ADVISORY LEGISLATIVE COUNCIL

To

THE GOVERNOR

And

THE GENERAL ASSEMBLY OF VIRGINIA

COMMONWEALTH OF VIRGINIA
Department of Purchases and Supply
Richmond
1971

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URBAN STREETS AND HIGHWAYS

Report of the
Virginia Advisory Legislative Council

Richmond, Virginia
January 1, 1972

TO: HONORABLE LINWOOD HOLTON, *Governor*

and

THE GENERAL ASSEMBLY OF VIRGINIA

Periodically since 1966 the Council has undertaken studies and made recommendations with respect to urban streets and highways and their relation to the total highway system of the Commonwealth.

In its report to the 1970 General Assembly, the Council made it clear that the goals of the Highway Commission's nine-year plan for highway construction, endorsed by the 1966 General Assembly, would not be met by the target date of 1975. The Council at that time urged consideration of the possibilities of increasing revenues, altering priorities and changing the methods of allocating resources for highway construction.

As a result, the General Assembly by means of House Joint Resolution No. 14, directed the Council to continue its study of the Commonwealth's highway needs, with particular emphasis on the urban areas. Pursuant thereto, the Council appointed a committee of three of its members—Delegate Lewis A. McMurran, Jr. of Newport News, who served as Chairman, Senator Edward E. Willey of Richmond, and Delegate Garnett S. Moore of Pulaski—to undertake this study.

The committee has worked closely with the Department of Highways in seeking ways to meet the Commonwealth's road system needs. The Department submitted its own report to the Council and the General Assembly, which is included as Appendix B of this report. It is the Council's desire to summarize and give emphasis to the recommendations contained therein.

In the two years that have intervened since the Council last reported on this problem, the impossibility of meeting the goals of the nine-year plan has become more evident. Delays in federal funding for the interstate system, higher standards of design and construction for safety and environmental purposes and, most importantly, inflation have put the 1975 target date beyond reach. Clearly major policy changes are needed to counteract the anticipated gap of $1.5 billion in financing the total plan.

As a result the Department of Highways and the Council recommend a new time schedule for achievement of the highest priority aspects of the original nine-year plan, during the decade from 1972 to 1982. This would include all of the remaining projects in the interstate and arterial networks, the highest priority items in the primary and secondary system improvement programs, increased State funds to municipalities for both construction and street maintenance and increased emphasis on urban transit-related projects.

Sources of Revenue

Achievement of these goals, even on an extended timetable, will re-

quire $650 million in new revenues from the State. The Department recommends, and the Council agrees, that these should come from two sources:

1. A fee of twenty-five dollars should be imposed upon motorists seeking reinstatement of suspended or revoked operators' permits. At the present time there is no charge for this service, and the administrative costs thereof, estimated to be twenty-five dollars for each renewal, are a burden on the total funds available for highway purposes. It is felt strongly that this burden should be borne by those motorists whose conduct creates it. Enactment of legislation imposing such a fee would result in a net increase in funds available of $2 million annually.

2. The State motor fuel tax should be increased by two cents per gallon. The Department points out that twenty other states have higher gasoline taxes than Virginia and only one of these states has a state highway system as long as ours.

Traditionally the motor fuel tax has been considered as a segregated revenue source, its proceeds being used only for highway purposes. This is the most equitable form of taxation, placing the cost burden for highway construction and maintenance on those who derive the benefits thereof. Since the cost of providing those benefits is increasing and the benefits themselves are to be improved, it seems logical that the charges to users, the "tolls" in the form of fuel taxes, should also be raised.

The existing tax of seven cents per gallon on gasoline generated $160,728,000 in net revenues in the 1970-71 fiscal year, or about $22,961,000 for each cent of tax per gallon. The average yield per mile for each type of highway is shown in Table A below, which is an updating of Table A in the Council's 1970 report. Also shown is an updated version of Table B of that report.

TABLE A

YIELD OF SEVEN CENTS PER GALLON STATE GAS TAX REVENUE, MOTOR VEHICLE LICENSE TAX AND TITLING TAX EARNED PER MILE IN 1970-71

TYPE OF HIGHWAY	MILES OF HIGHWAY	% OF TOTAL MILES	VEHICLE MILES PER DAY	% OF VEHICLE MILES	STATE GAS TAX REVENUE EARNED 1970-71	STATE GAS TAX EARNED PER MILE 1970-71	M.V.LICENSE TAX & TITLING TAX EARNED 1970-71	TITLING TAX EARNED PER MILE 1970-71	TOTAL PER MILE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(7) & (9)
			(thousands)		(thousands)	(hundreds)	(thousands)	(hundreds)	(hundreds)
Interstate	774	1.31	12,905	16.74	$ 26,906	$34,762	$14,945	$19,309	$54,071
Arterial	901	1.53	6,014	7.80	12,537	13,915	6,964	7,729	21,644
Other Primary	6,880	11.66	21,527	27.92	44,875	6,523	24,927	3,623	10,146
Urban Extensions	882	1.49	12,827	16.38	26,227	29,849	14,624	16,530	46,479
Other Streets	6,072	10.29	11,828	15.34	24,656	4,061	13,695	2,255	6,316
State Secondary	42,303	71.68	10,215	13.25	21,296	503	11,830	280	783
Arlington Secondary	373	.63	881	1.14	1,832	4,912	1,018	2,729	7,641
Henrico Secondary	829	1.41	1,107	1.43	2,299	2,772	1,276	1,540	4,312
TOTAL	59,014	100.00	77,104	100.00	$160,728	$ 2,724	$89,279	$ 1,513	$ 4,237

Estimated YIELD OF SEVEN CENTS PER GALLON STATE GAS TAX REVENUE, MOTOR VEHICLE LICENSE TAX AND TITLING TAX EARNED PER MILE IN 1971-72

TYPE OF HIGHWAY	MILES OF HIGHWAY	% OF TOTAL MILES	VEHICLE MILES PER DAY	% OF VEHICLE MILES	STATE GAS TAX REVENUE EARNED 1970-71	STATE GAS TAX EARNED PER MILE 1970-71	M.V.LICENSE TAX & TITLING TAX EARNED 1970-71	TITLING TAX EARNED PER MILE 1970-71	TOTAL PER MILE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(7) & (9)
			(thousands)		(thousands)	(hundreds)	(thousands)	(hundreds)	(hundreds)
Interstate	800	1.35	14,304	17.57	$ 29,342	$36,677	$15,618	$19,522	56,199
Arterial	940	1.59	5,508	6.77	11,306	12,027	7,278	7,742	19,769
Other Primary	6,831	11.53	22,781	27.99	46,743	6,842	25,941	3,797	10,639
Urban Extensions	894	1.51	13,044	16.02	26,753	29,925	15,283	17,095	47,020
Other Streets	6,202	10.47	12,311	15.13	25,267	4,074	14,312	2,309	6,383
State Secondary	42,370	71.52	11,016	13.54	22,612	533	12,463	294	827
Arlington Secondary	375	.63	1,179	1.45	2,422	6,459	1,064	2,837	9,296
Henrico Secondary	829	1.40	1,244	1.53	2,555	3,082	1,341	1,618	4,700
TOTAL	59,241	100.00	81,387	100.00	$167,000	$ 2,819	$93 300	$ 1,575	$ 4,394

TABLE B

DISTRIBUTION OF SECONDARY ROAD FUNDS in 1970-71

TYPE OF HIGHWAY	STATE FUNDS DISTRIBUTED	MILES OF ROAD	DISTRIBUTION PER MILE	POPULATION SERVED	DISTRIBUTION PER CAPITA
Other Streets (38 Cities - 33 Towns)	6,679,200	6,072	1,100	2,041,103	3.27
State Secondary	66,053,006	42,303	1,561	2,281,697	28.95
Arlington Secondary	1,733,560	373	4,648	174,284	9.75
Henrico Secondary .	2,482,365	829	2,994	154,364	16.08

Estimated DISTRIBUTION OF SECONDARY ROAD FUNDS IN 1971-72

TYPE OF HIGHWAY	STATE FUNDS DISTRIBUTED	MILES OF ROAD	DISTRIBUTION PER MILE	POPULATION SERVED	DISTRIBUTION PER CAPITA
Other Streets (38 Cities - 33 Towns)	6,924,500	6,295	1,100	2,041,103	3.39
State Secondary	72,439,746	42,260	1,714	2,281,697	31.75
Arlington Secondary	1,841,450	373	4,937	174,284	10.57
Henrico Secondary	2,636,843	829	3,181	154,364	17.08

The Council feels that fears that an increase in the gasoline tax might cause a decrease in road travel and thereby eventually a decline in revenues are unfounded. Experience with gasoline price "wars" has shown that even fluctuations in excess of ten cents per gallon in gasoline prices have little bearing on total fuel consumption.

The enactment in 1972 of the increase of two cents per gallon in the gasoline tax, together with the imposition of the twenty-five dollar reinstatement fee, should thus produce sufficient additional revenues in the ensuing ten-year period to close the $650-million gap in the Department's revised highway improvement plan.

Distribution of Funds

One of the matters urged by the General Assembly in House Joint Resolution No. 14 was a consideration of methods of allocating highway funds on a regional basis. The Department's report therefore recommends that the additional $545 million (of the $650 million total) available for construction under the above-described plan be allocated on a new regional formula.

Under this formula the new construction funds would be apportioned among the eight existing highway districts on the basis of six factors—latest population figures, land area, vehicle miles travelled, road mileage, total district needs, and vehicle registration. The last of these factors would be introduced for the first time in recognition of the fact that the higher vehicle concentrations in urban areas require heavier funding.

Such recognition would admittedly alter the current pattern of a roughly equal allocation of funds between urban and rural areas. However, it is strongly believed that this new approach, by recognizing the greatest needs, will ultimately produce a better highway system which will benefit both urban and rural areas, through increased socio-economic development of the entire Commonwealth.

Within the eight highway districts these new funds would be applied to construction of the various highway systems solely on the basis of overall need, without regard to jurisdictional boundaries. This, too, is believed by the Council and the Department to be necessary for sound overall planning of the State system of highways.

As noted in the Council's 1970 report, placing a higher priority on urban highway needs has the further advantage of minimizing inflation. This is true largely because the cost of right-of-way acquisition is rising more rapidly in the metropolitan areas. It seems logical that the projects whose cost will rise fastest be given priority, deferring those whose cost will likely be more static.

The Department also recommends in its report a new method for distributing street maintenance funds to the cities and towns over 3,500 population. Of the ten-year increased revenue projection of $650 million, $95 million would be earmarked for this purpose. At present these payments are made to the municipalities on a lineal-mile basis at an annual rate of $10,000 per mile for primary route extensions and $1,100 per mile for other urban streets. The Department has believed for some time that a distribution on the basis of lane-miles would be more equitable, but information on lane-miles in service was not readily available.

New management practices now make it possible to determine these figures; therefore, it is recommended that maintenance payments be made to municipalities on the basis of lane-miles of streets available for peak

hour traffic. These payments would be at the rate of $2,500 per-lane mile on primary extension streets and $1,500 per lane-mile on other streets. Appendix A shows the difference this will make in payments to the various localities in the urban system.

The Council recommends that the General Assembly should require that the several cities and towns and Arlington and Henrico counties file with the State Highway Department annual audited reports of expenditures for highway purposes.

The remaining $10 million of the $650 million to be derived from the new revenue sources would be used for expansion of the industrial access road program. Of the $650 million it is estimated that over $150 million will be expended under the above-described new funding formulas for highway projects in the major urban centers that will be directly related to mass transit projects. The Department of Highways is already involved in a number of such projects and the Council considers it imperative that these be given continued emphasis if an overall transportation crisis in the larger cities is to be averted.

Conclusion

As the Department's report notes, the new ten-year plan for the decade 1972-1982 here proposed has been cut to the bone. The goals set therein are the minimum required if the Commonwealth is to maintain a viable highway system into the 1980's. While the necessity of altering the original plan is regrettable, the Council therefore, firmly believes the recommendations for increasing revenues and shifting priorities made herein to be essential.

Legislation will be introduced to carry out these recommendations.

The Secretary of the Virginia Advisory Legislative Council and the Division of Statutory Research and Drafting made staff and facilities available to carry out this study; Roger C. Wiley, Jr. was assigned to assist the members and the study group.

Respectfully submitted,

ROBERT C. FITZGERALD, *Chairman*
ARTHUR H. RICHARDSON, *Vice-Chairman*
M. CALDWELL BUTLER
RUSSELL M. CARNEAL
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JAMES C. TURK
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* Senator Moody approves the Report subject to following reservations:

STATEMENT OF WILLARD J. MOODY

It is my view that some logical assistance should be given to toll facilities operated by separate authorities. At the present time the Department of Highways has made provision for maintenance assistance to toll facilities operated by the Department. It appears only fair that similar provision should be made for toll facilities which are not operated by the Department of Highways. Provision should be made for positive assistance to such facilities, either by way of maintenance by the Department of Highways, or credit to such facilities for that portion of the gasoline tax attributable to the use of them.

Willard J. Moody

E - S - T - I - M - A - T - E

P & S
October 1971

S U M M A R Y

COMPARISON OF PRESENT URBAN MAINTENANCE COST WITH A MAINTENANCE COST PER LANE MILE

City or Town	PRIMARY EXTENSIONS			OTHER CITY STREETS			TOTAL PER CITY OR TOWN	
	Present Payments	Lane Miles	Cost @ $2500 Per Moving Lane Mile	Present Payments	Lane Miles	Cost @ $1500 Per Moving Lane Mile	Net Increase	% Increase
Abingdon	$ 44,000	9.8	$ 24,500	$ 21,560	39.2	$ 58,800	$ 17,740	27.1
Alexandria	$ 124,000	46.2	$115,500	$190,960	351.4	$ 527,100	$327,640	104.0
Bedford	$ 92,000	21.0	$ 52,500	$ 26,730	48.6	$ 72,900	$ 6,670	5.6
Big Store Gap	$ 30,000	6.0	$ 15,000	$ 22,110	40.2	$ 60,300	$ 23,190	44.5
Blacksburg	$ 35,000	8.6	$ 21,500	$ 40,370	73.4	$ 110,100	$ 56,230	74.6
Blackstone	$ 36,000	7.2	$ 18,000	$ 25,630	46.6	$ 69,900	$ 26,270	42.6
Bluefield	$ 45,000	9.0	$ 22,500	$ 18,040	32.8	$ 49,200	$ 8,660	13.7
Bristol	$ 77,000	24.6	$ 61,500	$ 58,850	107.0	$ 160,500	$ 86,150	63.4
Buena Vista	$ 34,000	6.8	$ 17,000	$ 27,170	49.4	$ 74,100	$ 29,930	48.9
Charlottesville	$ 117,000	34.4	$ 86,000	$128,700	236.4	$ 354,600	$194,900	79.3
Chesapeake	$1,024,000	260.0	$650,000	$496,540	904.2	$1,356,300	$485,760	31.9
Christiansburg	$ 83,000	19.6	$ 49,000	$ 38,060	69.2	$ 103,800	$ 31,740	26.2
Clifton Forge	$ 40,000	8.7	$ 21,750	$ 1[illegible],040	32.8	$ 49,200	$ 12,910	22.2
Colonial Heights	$ 33,000	13.2	$ 33,000	$ 58,41[illegible]	106.2	$ 159,300	$100,890	110.4
Covington	$ 65,000	15.6	$ 39,000	$ 33,440	61.4	$ 92,100	$ 32,660	33.2

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S U M M A R Y

COMPARISON OF PRESENT URBAN MAINTENANCE COST WITH A MAINTENANCE COST PER LANE MILE

City or Town	PRIMARY EXTENSIONS			OTHER CITY STREETS			TOTAL PER CITY OR TOWN	
	Present Payments	Lane Miles	Cost @ $2500 Per Moving Lane Mile	Present Payments	Lane Miles	Cost @ $1500 Per Moving Lane Mile	Net Increase	% Increase
Culpeper	$ 85,000	30.0	$ 75,000	$ 26,290	47.8	$ 71,700	$ 35,410	31.8
Danville	$252,000	85.6	$214,000	$168,630	311.8	$467,700	$261,070	62.1
Emporia	$ 34,000	10.4	$ 26,000	$ 23,320	42.4	$ 63,600	$ 32,280	56.3
Fairfax	$114,000	35.5	$ 88,750	$ 54,450	99.0	$148,500	$ 68,800	40.8
Falls Church	$ 45,000	17.2	$ 43,000	$ 28,710	52.2	$ 78,300	$ 47,590	64.6
Farmville	$ 70,000	15.9	$ 39,750	$ 28,270	51.4	$ 77,100	$ 18,580	18.9
Franklin	$ 49,000	15.4	$ 38,500	$ 30,250	55.0	$ 82,500	$ 41,750	52.7
Fredericksburg	$102,000	30.0	$ 75,000	$ 45,760	83.2	$124,800	$ 52,040	35.2
Front Royal	$ 57,000	16.8	$ 42,000	$ 37,290	67.8	$101,700	$ 49,410	52.4
Galax	$ 83,000	22.4	$ 56,000	$ 44,110	80.2	$120,300	$ 49,190	38.7
Hampton	$499,000	166.2	$415,500	$320,210	618.0	$927,000	$523,290	63.9
Harrisonburg	$ 98,000	25.6	$ 64,000	$ 50,270	91.4	$137,100	$ 52,830	35.6
Herndon	$ 25,000	5.8	$ 14,500	$ 17,380	31.6	$ 47,400	$ 19,520	46.1
Hopewell	$ 95,000	27.4	$ 68,500	$100,210	182.2	$273,300	$146,590	75.1
Leesburg	$ 39,000	7.8	$ 19,500	$ 17,600	32.0	$ 48,000	$ 10,900	19.3

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COMPARISON OF PRESENT URBAN MAINTENANCE COST WITH A MAINTENANCE COST PER LANE MILE

City or Town	PRIMARY EXTENSIONS			OTHER CITY STREETS			TOTAL PER CITY OR TOWN	
	Present Payments	Lane Miles	Cost @ $2500 Per Moving Lane Mile	Present Payments	Lane Miles	Cost @ $1500 Per Moving Lane Mile	Net Increase	% Increase
Lexington	$ 51,000	10.8	$ 27,000	$ 20,130	36.6	$ 54,900	$ 10,770	15.1
Luray	$ 49,000	9.8	$ 24,500	$ 22,330	40.6	$ 60,900	$ 14,070	19.7
Lynchburg	$306,000	81.5	$203,750	$156,640	285.1	$ 427,650	$ 168,760	36.5
Manassas	$ 70,000	15.2	$ 38,000	$ 36,300	66.0	$ 99,000	$ 30,700	28.9
Manassas Park	$ 19,000	3.8	$ 9,500	$ 10,230	18.6	$ 27,900	$ 8,170	28.0
Marion	$ 54,000	12.4	$ 31,000	$ 27,280	49.6	$ 74,400	$ 24,120	30.0
Martinsville	$108,000	28.9	$ 72,250	$ 85,470	155.8	$ 233,700	$ 112.480	58.1
Newport News	$590,000	208.0	$520,000	$344,410	648.0	$ 972,000	$ 557.590	59.7
Norfolk	$768,000	301.2	$753,000	$681,450	1,252.9	$1,879,350	$1,182,900	81.6
Norton	$ 64,000	12.8	$ 32,000	$ 12,210	22.2	$ 33,300	-$ 10,910	-14.3* See Note Last Page
Petersburg	$124,000	33.4	$ 83,500	$106,370	193.4	$ 290,100	$ 143,230	62.2
Poquoson	$ 90,000	18.0	$ 45,000	$ 29,260	53.2	$ 79,800	$ 5,540	4.6
Portsmouth	$279,000	92.4	$231,000	$365,046	666.0	$ 999,000	$ 585,954	91.0
Pulaski	$ 57,000	16.2	$ 40,500	$ 45,650	83.0	$ 124,500	$ 62,350	60.7
Radford	$ 37,000	13.0	$ 32,500	$ 56,870	103.4	$ 155,100	$ 93,730	99.9

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SUMMARY

COMPARISON OF PRESENT URBAN MAINTENANCE COST WITH A MAINTENANCE COST PER LANE MILE

City or Town	PRIMARY EXTENSIONS			OTHER CITY STREETS			TOTAL PER CITY OR TOWN	
	Present Payments	Lane Miles	Cost @ $2500 Per Moving Lane Mile	Present Payments	Lane Miles	Cost @ $1500 Per Moving Lane Mile	Net Increase	Z Increase
Richlands	$ 40,000	11.0	$ 27,500	$ 17,270	31.4	$ 47,100	$ 17,330	30.3
Richmond	$654,000	240.8	$602,000	$764,170	1,462.0	$2,193,000	$1,376,830	97.1
Roanoke	$300,000	92.6	$231,500	$336,710	612.2	$ 918,300	$ 513,090	80.6
Rocky Mount	$ 54,000	13.0	$ 32,500	$ 16,720	30.4	$ 45,600	$ 7,380	10.4
Salem	$167,000	46.6	$116,500	$109,230	198.6	$ 297,900	$ 138,170	50.0
South Boston	$ 59,000	13.6	$ 34,000	$ 27,390	49.8	$ 74,700	$ 22,310	25.8
South Hill	$ 63,000	14.7	$ 36,750	$ 25,850	47.0	$ 70,500	$ 18,400	20.7
Staunton	$146,000	35.2	$ 88,000	$ 79,530	144.6	$ 216,900	$ 79,370	35.2
Suffolk	$ 57,000	14.4	$ 36,000	$ 30,690	55.8	$ 83,700	$ 32,010	36.5
Tazewell	$101,000	20.2	$ 50,500	$ 9,900	18.0	$ 27,000	$ 33,400	-30.1 * See Note Last Page
Vienna	$ 30,000	11.4	$ 28,500	$ 56,650	103.0	$ 154,500	$ 96,350	111.2
Vinton	$ 22,000	8.8	$ 22,000	$ 34,540	63.4	$ 95,100	$ 60,560	107.1
Virginia Beach	$606,000	197.7	$494,250	$790,680	1,346.8	$2,020,200	$1,117,770	80.0
Warrenton	$ 82,000	22.2	$ 55,500	$ 17,930	32.6	$ 48,900	$ 4,470	4.5
Waynesboro	$ 89,000	21.4	$ 53,500	$ 68,750	125.0	$ 187,500	$ 83,250	52.8

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S U M M A R Y

COMPARISON OF PRESENT URBAN MAINTENANCE COST WITH A MAINTENANCE COST PER LANE MILE

City or Town	PRIMARY EXTENSIONS			OTHER CITY STREETS			TOTAL PER CITY OR TOWN	
	Present Payments	Lane Miles	Cost @ $2500 Per Moving Lane Mile	Present Payments	Lane Miles	Cost @ $1500 Per Moving Lane Mile	Net Increase	% Increase
Williamsburg	$ 118,000	31.0	$ 77,500	$ 26,400	48.0	$ 72,000	$ 5,100	3.5
Winchester	$ 107,000	24.2	$ 60,500	$ 61,710	112.2	$ 168,300	$ 60,090	35.6
Wytheville	$ 54,000	15.7	$ 39,250	$ 47,080	85.6	$ 128,400	$ 66,570	65.9
Totals	$8,941,000	2,694.6	$6,736,500	$6,718,206	12,285.6	$18,428,400.	$9,505,694	60.7

* Both Morton and Tazewell are obtaining Appalachian Development Projects which include substantial Federal Revenues from the General Fund.

APPENDIX B

VIRGINIA'S ROADS AND STREETS
1972-82

A Report of the State Highway Commission to the Virginia Advisory Legislative Council December, 1971.

FOREWORD

In many ways, Virginia's roads and streets are her lifelines.

They are essential to full development and enjoyment of her economic, social, cultural and educational opportunities. Every citizen shares in the benefits of an adequate highway transportation system.

Substantial progress has been made in development of the system. The Commonwealth's highway facilities are better now than they were a decade ago. Perhaps there is a temptation to accept what has been accomplished, and to be satisfied with the present rate of improvement. There are risks in such satisfaction.

Within the past decade, Virginia's population rose from 3,954,446 to 4,651,448. Urban areas experienced extensive growth, with more than two-thirds of all Virginians now living in these areas. The number of registered motor vehicles increased from 1,451,338 to 2,217,081. Travel on the state highway system increased more than 65 per cent, and now averages approximately 50 million vehicle miles daily.

The Commonwealth has continued her efforts to encourage desirable industrial growth and tourism, and has embarked on such major new programs as those to develop an important system of community colleges and to expand the system of state parks.

All of these factors are related—people, the places in which they choose to live, their reliance on mobility, and the basic needs for a strong economy and for equally strong educational and recreational opportunities.

But much remains to be done in order to provide Virginians with what truly may be considered an adequate, statewide highway transportation system.

In every county, city and town, there are substandard facilities. Throughout Virginia, there remain thousands of miles of roads and hundreds of bridges constructed more than 40 years ago. They were satisfactory for the uses they were built to serve; they are far from satisfactory for demands of the 1970s, and for those of the years beyond. With growing urbanization, there are mounting needs to improve highway-related mass transit operations, and to increase state assistance to the municipal street program.

Efforts to insure an adequate highway system have been slowed severely, however, by sharply rising costs brought on by inflation and by higher design standards for safety and aesthetics and by more stringent controls for environmental protection.

This report, prepared for the Virginia Advisory Legislative Council, represents a reassessment of the Commonwealth's road and street needs, and suggests an alternative to at least some of the missing links.

THE NINE-YEAR PLAN: BEYOND REACH

A nine-year highway improvement plan, intended to meet the basic, minimum needs of motorists by the mid-1970s, was prepared by the Department of Highways in 1965, and was approved by the 1966 session of the General Assembly.

The plan envisioned all of the interstate system being completed or under construction in 1972, completion of financing for the supplementary arterial network by 1975, initial construction of planned urban expressways, and limited improvements to the regular primary, urban and secondary systems.

Cost of the program, based on design and construction standards and price levels in 1965, totaled $3 billion in state and federal funds and in the municipalities' share of urban system construction projects. Additional funds provided by the Legislature in 1966 and income from prior revenue sources were expected to be sufficient to finance the plan.

Even if completed on schedule, the nine-year plan would have left many desirable improvements unmet, because it proposed doing only what was considered essential to provide a "minimum, tolerable" road system by 1975.

But it will not be completed on schedule.

When the plan was prepared, the federal government anticipated completion of the national interstate highway system financing in 1972. The timetable now has been extended formally to 1976; it will be even later, probably into the 1980s, before all segments of the present system are finished.

That means a substantial stretchout in the interstate program, a factor beyond control of state government. Ninety per cent of interstate system construction costs is derived from the federal Highway Trust Fund, and thus the state's schedule for this program must, of course, be adjusted to the federal schedule.

The nine-year plan also anticipated that a large amount of federal funds would be diverted from the interstate program about 1972 to help meet other road and street needs, particularly those in urban regions. The interstate delay, consequently, will mean that these funds will not become available for other systems when expected.

The interstate system stretchout was caused in large measure by the same factors that have affected other elements of the Commonwealth's highway improvement plan.

Inflation is the most evident. It has pushed construction costs upward by approximately 35 per cent since 1966. The costs of labor, materials and equipment all have risen sharply.

Higher levels of design and construction for safety and environmental purposes also have contributed significantly to the overall increase.

New safety standards, for example, require shoulder areas to be as wide on bridges as on the rest of the roadway. Former standards, based on economy and limited funds, permitted much more narrow shoulders on bridges. Other safety standards put into effect since the nine-year plan was developed require outside supports for overpasses to be placed farther back from the pavement, thus requiring longer overpasses. The new standards also provide for flatter slopes, necessitating more right-of-way and greater construction costs; breakaway supports for signs and lights, and extensive modifications in guardrail design and installation.

The increased public interest in environmental protection and enhancement is welcomed by all thoughtful citizens. The idea of blending the highway pleasingly into the area through which is passes has long been a guiding concept in Virginia, and is illustrated clearly in the design for

mile after mile of the interstate system. Natural foliage and terrain have been preserved in the median area and along the sides of the divided roadways, and the median has been planned to meander in order to take advantage of such natural features. An organized landscaping program has been conducted by the Department of Highways for more than 40 years, as a means of adding beauty to the road and to help control erosion.

The broadened public concern for the environment has prompted still greater emphasis on such amenities, and has led to stringent new controls. Construction-related specifications, for example, now require reduced pollutant emissions from bituminous mixing plants, restrict open burning, tighten control on locations of borrow pit, quarry and waste disposal operations, and control runoff water by temporary settlement basins. They also set limits on the denuding of portions of construction sites in grading operations, restricting the area which may be exposed at one time before reseeding is begun, in order to reduce erosion. The specifications also provide for earlier seeding of slopes.

In 1966-67, first fiscal year of the nine-year plan, approximately 91 cents of every highway dollar available for construction actually went into basic construction to meet increased traffic needs. That figure has dropped to 56 cents, with inflation and higher standards claiming larger shares of the construction dollar.

All of these factors—inflation and higher design and construction standards—have produced a substantial increase in the original estimate of $3 billion to attain the objectives of the nine-year plan.

The same improvements, based on the new standards and reflecting present and anticipated price levels, now are estimated to cost $4.7 billion.

Revenue has increased somewhat beyond the first estimates, because of increased traffic volumes, but not nearly enough to off-set the higher costs. Instead of the originally anticipated $3 billion in income, revenue from existing sources now is expected to amount to approximately $3.2 billion during the span of the nine-year period, 1966-1975.

This will leave a gap of $1.5 billion in financing the total plan.

Following is a summary, by road system, of the objectives of the nine-year plan and of accomplishments thus far:

* *Interstate System*—The basic objective was to have all of Virginia's then-authorized 1,065-mile share of this national system completed or financed and under construction by 1972, as provided under federal and state planning in 1965. The target date now has been extended by Congress to 1976; actual completion will be much later.

Status: 815 miles, or 76 per cent, completed; 47 miles, 4 per cent, under construction; 215 miles, 20 per cent, in planning stages.

* *Arterial Network*—The General Assembly in 1964 recognized that the interstate system alone would not adequately meet Virginia's need for modern cross-state highways, and authorized development of the 1,738-mile arterial network.

Generally, the arterial highways are being developed by construction of a new two-lane roadway parallel to an existing two-lane primary route, creating a four-lane divided facility.

Bypasses of 74 communities are being constructed on entirely new locations, as are a few rural segments where it is essential to improve

alignment. Original plans called for the bypasses to be constructed with little or no grade separation, for economy reasons. Time and again, however, citizens have urged such features, and as a result most bypasses are being built virtually to interstate system standards, with these added safety measures.

The objective in the nine-year plan for the arterial network was to have it fully constructed or financed in 1975. It has fallen behind schedule. Many of the remaining projects are among the most expensive.

While 950 miles, or 55 per cent, of the network is now up to arterial standard, this is a misleading picture of actual progress. For of the network's 1,738 miles, 370 miles already were four-laned when the program began in 1964, and were included for continuity purposes.

Of the 1,368 miles remaining to be developed when the program was authorized, only 580 miles have been finished and an additional 90 miles have been placed under contract. A total of 698 miles remain to be started, although plans have been completed for much of this mileage.

* *Regular Primary System*—Besides the interstate and arterial highways, there are 6,043 miles of regular primary roads in Virginia. Most are two-lane routes, although some are three lanes and a few segments are four lanes wide.

In many areas, the regular primary roads continue to be the principal highways, serving the mainstream of traffic and functioning as feeder roads to the interstate, arterial and urban networks.

Indeed, these regular primary roads still serve 47 per cent of all traffic using the state's rural highways.

The nine-year plan proposed improvements ranging from major four-lane construction to widening existing pavements and undertaking so-called "spot" improvements to correct accident-prone locations.

Improvements were determined to be essential on 1,945 miles of the system. Altogether, they have been completed on 350 miles—or 17.5 per cent—and it is not likely that even half of them can be made by 1975 with present levels of funding.

* *Secondary System*—The state secondary system totals 42,303 miles, and includes the local roads in 94 of Virginia's 96 counties. The two exceptions, Arlington and Henrico, maintain and improve their own local roads, and receive appropriations from state highway user tax revenues for this purpose.

The growing industrialization and urbanization of the Commonwealth have placed heavy new demands on this system. This has been particularly evident in the counties where extensive suburban growth has occurred, but many needs remain unmet on rural portions of the system, as well.

The nine-year plan provided for a hard surface of width and strength adequate for traffic served on all roads carrying 50 or more vehicles a day; an all-weather stone or gravel surface on roads carrying 10 to 50 vehicles a day; a light stone or gravel surface on all roads carrying less than 10 vehicles daily; and bringing all bridges of less than 10-ton capacity up to standard.

Twenty-seven per cent of these improvements, totaling 6,723 miles, have been made. Seventy-three per cent remain unmet, although about two-thirds of the time for the nine-year plan has elapsed.

* *Urban System*—The plan recognized Virginia's rapid urban development, and envisioned acceleration of improvements on the urban street system, which totals 7,000 miles. This system is confined to corporate limits of cities and towns, and is in addition to urban segments of the interstate system and the arterial network and suburban links in the regular primary and secondary systems.

The nine-year plan included 830 miles of new construction or improvements to existing facilities in the urban system. Projects totaling 224 miles will have been completed by year's end, representing 27 per cent of the planned work.

THE PERIOD 1972-82: AN ALTERNATIVE

The problem of meeting the Commonwealth's street and highway needs will not go away. It will only worsen as the cost of highway construction and right-of-way and the number of registered motor vehicles continue to accelerate.

It is clear that full implementation of the state's nine-year plan no longer is practical within the planned time schedule. The Highway Commission reported this dilemma in 1970, and with this in mind the General Assembly directed the Virginia Advisory Legislative Council to continue its study of road and street needs.

The Department of Highways has worked closely with the VALC in making this study, and has spent several months reassessing the nine-year plan, the state's highway transportation needs, and the outlook for the years ahead.

The result is a recommendation that Virginia build upon the nine-year plan by using most of its unfulfilled objectives as the nucleous for an extended improvement program covering the period 1972-82, and equitably balanced between the needs of urban and rural areas alike. It must be emphasized that this 10-year program also envisions a very minimum development plan, that considered absolutely essential to meet basic demands.

The need for an increased emphasis on urban transportation problems is evident, but it cannot be achieved by ignoring the requirements which remain in the rural portions of Virginia.

Following are the overall objectives of the 10-year program, which would begin July 1, 1972, and extend through the 1981-82 fiscal year:

—The presently-authorized 1,077 miles of interstate highways completed or fully financed and under construction.

—The supplementary 1,738-mile arterial network completed or under construction.

—Highest priority primary system projects completed or under way. This would include improvements to 1,990 miles of the system.

—A limited acceleration of the current secondary system improvement program, with provisions for improvements to 9,800 miles of roadway and to 2,080 obsolete bridges.

—Substantially increased state assistance to municipalities, both through additional construction funds and adjustments in street maintenance payments.

—A stepped-up emphasis on transit-related projects in major urban regions.

The program anticipates that income from existing state revenue sources will continue to increase an estimated 4 per cent annually, and that in view of the nationwide need for improved highways, federal participation likely will be continued through 1982 and beyond. It also contemplates that approximately $50 million in federal funds will be provided Virginia in the five years through fiscal 1978 under the Congressional extension of the Appalachian Regional Development Act.

In preparing the program, planning engineers have taken into account the probable influence of inflation in the period 1972-82.

The program also is based upon the belief that the traditional method of financing highway construction and maintenance with revenue from taxes paid by highway users is an equitable means of providing necessary funding. This means that those who benefit most directly bear the cost, and relieves the state's General Fund completely of support for highways.

Total cost of the 10-year program amounts to $5.2 billion. Additional revenue totaling $650 million will be required to finance these basic improvements.

Since the program is based already on full utilization of all available federal funds, this means that the gap would be filled with additional revenue from state sources.

It can be filled with a two-cent per gallon increase in the state motor fuel tax and by imposing a $25 fee for motorists seeking reinstatement of suspended or revoked operators' permits. There is no such reinstatement fee at present, and the cost of administering this program is borne by all motorists.

Virginia's present state gasoline tax is seven cents a gallon, and has not been increased since 1960, when it was raised from six cents. In the Commonwealth as in all states, motorists also pay a four-cent federal gasoline tax.

Already, twenty other states have found it necessary to enact state gasoline levies higher than that in Virginia, and the tax rate in one state is 10 cents a gallon. However, the Commonwealth's state highway system exceeds all but one of these 20 state systems in length.

DISTRIBUTION OF ADDITIONAL FUNDS

The additional $650 million proposed in state funds would provide $545 million for highway construction, $95 million additional for street maintenance payments to cities and towns over 3,500 population, and $10 million more for expansion of the industrial access road program.

The $545 million which would be available for highway construction would be distributed among the state's eight highway districts on a new formula focusing more heavily on the urban growth of the Commonwealth. But the funds also would permit completion of the arterial network and of basic improvements on rural portions of the regular primary and secondary systems. All Virginians have a stake in all elements of the program. Rural residents travel in urban areas, urban residents travel with increasing frequency in rural areas.

The new funds would be apportioned to the districts on the basis of a six-factor formula taking into account latest population figures, vehicle miles of travel, square miles of land area, road mileage, total need, and vehicle registration.

Such a formula introduces for the first time the factor of vehicle registration in determining the distribution of highway funds. This would help to insure an equitable sharing of these resources, while at the same time reflect the fact that the heaviest concentrations of motor vehicles are in the urban areas.

The additional funds assigned to each district under this formula would be distributed within the district to the various highway systems solely on the basis of relative need in the district, without regard to jurisdictional boundaries.

At present on a statewide basis, highway construction funds are divided about evenly between rural and urban areas.

While the objectives for rural Virginia in the 10-year program are largely those of long-standing—interstate and arterial completion, basic upgrading of the regular primary and secondary systems, replacement of obsolete bridges—several changes are proposed for the urban areas.

There is a growing concern both for improved mass transportation in urban areas and for increased safety and mobility on existing urban streets. The program focuses greater attention on both of these needs, and earmarks $150 million for such improvements.

Traffic engineering techniques, such as modern signal systems and channelization of intersections, assist significantly in improving vehicular flow on existing streets without major reconstruction. This is the objective of the Traffic Operations Program to Increase Capacity and Safety (TOPICS), which already is proving helpful in a number of cities. This concept is expanded in the 10-year program.

The program also provides for highway-related mass transportation improvements in major urban areas, through such measures as reserved bus lanes, passenger shelter and off-street parking lots in suburban and downtown areas. Funds are included, in addition, to improve access roads and streets leading to passenger stations which will serve commuter rail and bus lines.

The program would provide some $112 million more for construction on the urban system, supplementing the approximately $626 million anticipated from existing revenue sources for regular construction and maintenance payments on this system during the 10-year span.

Finally, the program envisions substantial changes in the methods of making street maintenance payments to the cities and towns of over 3,500 population. Under existing law, these payments are made on a lineal mile basis and amount annually to $10,000 a mile for extensions of primary routes and $1,100 a mile for other streets which comply with the requirements as to width of right-of-way and surface of Section 33.1-43 of the Code.

The Department of Highways' continuing study for the VALC indicates that the allocation of the new funds on a lane mile basis for lanes available for traffic would represent a desirable change if sufficient funds are provided.

Until recently, lane mile cost information was not readily available. However, the department's new maintenance management practices now provide such data.

An in-depth study of these costs shows that for primary routes maintained by the state and contiguous to the cities and carrying similar vol-

umes and types of traffic, yearly lane mile maintenance costs average $2,129 for the area and up to $2,421 for individual roads. It should be pointed out that some additional services, such as lighting, sidewalks, and parking areas, are provided on city streets but are not ordinarily provided on the regular primary routes.

Based on these considerations, it is recommended that the payments to cities and towns of over 3,500 population be based on lane miles instead of lineal miles, and that these payments be at the rate of $2,500 per lane mile annually for primary extensions.

Similarly, changes are proposed in maintenance payments for other city streets. In this case, the locality not only performs the maintenance and maintenance replacement work, but usually the cost of construction or reconstruction is handled without state participation because most state urban system funds are needed for the primary extensions.

The Department of Highways has reviewed its total lane mile allocations to the Secondary System in suburban counties, to determine whether changes were desirable in the method of making payments to the municipalities for the other streets as well as for primary extensions.

This study shows that allocations for the 8,580 lineal miles of Secondary System streets in suburban counties total $24,927,306 in the present fiscal year. Converted to lane mileage, these streets total 17,700 miles, with an average allocation of $1,409 per lane mile.

Thus, it is recommended that the payments now established at $1,100 per lineal mile for similar city and town streets be increased to $1,500 per lane mile for lanes available for traffic movement.

Together, these proposed changes for the primary extensions and other local streets will provide nearly $10 million more annually to the cities and towns for the urban system.

MASS TRANSIT

With the Commonwealth's urban growth has come the need for improvements in mass transportation facilities, and an added emphasis on the movement of people—not only vehicles—during peak traffic period.

Important steps already have been taken:

* In 1964, the General Assembly authorized establishment of transportation districts, in which two or more localities may join efforts to bring about improved public transit. Through such districts, administered by commissions, localities have the mechanism to provide coordinated, area-wide public transit service. The Northern Virginia Transportation Commission (NVTC) is the only unit functioning at present under this authorization; its accomplishments have been significant.

* The 1968 session of the General Assembly established the Virginia Metropolitan Areas Transportation Study Commission, which recommended a comprehensive analysis of the position of public transit after finding most transit companies faced with serious financial problems. The Legislature in 1970 extended the work of this Commission, assigning it the mission of making such an analysis. Its findings will be before the 1972 General Assembly.

* The Legislature in 1970 authorized the use of highway funds for such transit-related projects as construction of exclusive bus lanes, off-

street parking lots in fringe and downtown areas, bus turnouts, and passenger shelters.

* The Department of Highways has joined with the NVTC, the U. S. Department of Transportation's Urban Mass Transportation Administration and Federal Highway Administration, and the Washington Metropolitan Area Council of Governments in conducting an experimental busway project on approximately 10 miles of the Shirley Highway (Interstate 95) in Northern Virginia. Under this plan, lanes are reserved exclusively for buses, permitting them to bypass congestion in the conventional lanes.

Since the Shirley busway project began in September, 1969, the number of commuters riding buses has more than doubled. At the outset, 39 buses carried approximately 1,900 passengers from the Virginia suburbs into Washington during the peak morning period. Now 102 buses carry 5,100 riders during the same period, an increase of 168 per cent.

This represented the first instance in the United States in which lanes of an interstate highway were reserved for buses. While several similar projects now have been undertaken elsewhere in the nation, the Shirley experiment continues to be observed with interest by many transportation agencies.

* The Department of Highways, with the Richmond Regional Planning District Commission and the City of Richmond and the County of Henrico, is at present attempting to arrange an express commuter bus operation between the suburban west end and downtown. The Department, acting under authorization of the 1970 General Assembly for highway funds to be used for such projects, has purchased land for a fringe parking lot.

* Planning for six miles of Interstate 66 in Northern Virginia is being coordinated with the Washington Metropolitan Area Transit Authority's planning for its commuter rail and subway line, so that the rail line and several passenger stations may be located in the median of the highway.

Virginia's course for the years ahead in mass transit planning and operations should be based on the recommendations of the Virginia Metropolitan Areas Transportation Study Commission. The Department of Highways will work closely with other agencies when appropriate to implement these recommendations, and will continue to strengthen its efforts in bringing about mass transportation improvements. The $150 million included in the 10-year program will be essential to help finance these new projects, and to improve mobility for buses and other vehicles on existing streets.

SUMMING UP

Obviously, in developing a long-range program of highway transportation improvement and in asking motorists to make an additional financial commitment to such a program, consideration must be given to the state's ability to perform the work it promises.

Can the design and other planning work be accomplished with present manpower? Can public hearings be held on individual projects as needed, to insure citizen participation in project planning? Will there be time enough to purchase the necessary right-of-way, and to provide relocation assistance? Is the construction industry capable of executing the work efficiently?

These are fundamental requirements. And they were considered care-

fully in establishing the time limits for the 10-year program. They can be met.

Indeed, the full objectives can be reached—if the program begins now, if sufficient funding is provided, and if an orderly work schedule is maintained.

Experience has shown all too clearly that the task will grow more difficult and become more expensive the longer it is delayed.