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Secondary Road Program in North Carolina

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The Secondary Road Program in North Carolina

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North Carolina ranks high among the states in rural population, total crop value, state-operated local road mileage, recently paved secondary roads, and total inventory of paved local roads. Without equal in any state is the fact that over 15,000 secondary system local road miles were recently paved in five years. The North Carolina experience should provide valuable before-and-after data in terms of traffic service, traffic generation, program cost, and public service in terms of improvements in rural economic and social values.

This report presents complete vehicle-mile and road use analyses by geographical areas before and after the large paving program, relates traffic transfer and traffic generation to land use, makes comparisons with other states without such a program, and presents similar data on the Federal Aid Secondary portion of the system.

Data are presented on the state expenditures of some $350 million on this local system within a five-year period, and $478 million in nine years.

Since local roads serve rather than create economic and sociological growth, the report does not attempt to evaluate this service statistically. However, considerable data are presented showing the contemporary growth of such factors which contribute to a "better way of life," based on factual North Carolina records. Such growth factors are reflected in data on agriculture, livestock, milk, poultry, rural telephones, motor vehicles, electricity, health, employment, education, level-of-living index, voting, library service, rural industry, etc.

The most direct statistic of service is the volume of paved road traffic. The report points out that the daily vehicle-miles of travel on hard-surfaced secondary rural roads grew from 1,880,500 to 5,898,700 from 1949 to 1953. Thus, on the average day of 1953, more than 4,000,000 vehicle-miles of paved local road service were provided, a service not provided just four years before. To anyone familiar with rural sociology, transportation, or economics, this cardinal fact is a tangible measure of a better way of life.

● IN many ways, North Carolina is outstanding and unique among the states in the field of local or secondary state roads. The state's secondary road system comprises some 55,000 miles of local public rural roads, in addition to the 11,000 miles of US and NC numbered routes. Being one of the leading agricultural states in the nation, North Carolina has long put great emphasis on its secondary or farm-to-market roads. Only two or three states in the nation produce a higher annual crop value than does North Carolina. About a third of the state population is on farms, while another third is rural non-farm; that is, mainly suburban. Only two states—Pennsylvania and Texas—have more rural population than North Carolina. The following points with respect to secondary roads in North Carolina are significant:

1. For more than 24 years, the state has had complete responsibility for the maintenance and improvement of all the public roads in the state. North Carolina was the first state in the nation to take such action, completely relieving the counties and townships of all local roads in 1931. Since that date, the motor vehicle tax, and not real property tax has furnished all the tax revenues for the building, improvement and upkeep of all local roads, as well as state highways.
2. The state has financed a more expensive program of secondary road improvements than has any other state in recent years. During the five years ending June 30, 1954, the state spent $350 million on this system; since 1931, the state has expended over $600 million on this system (both including Federal Aid).
3. The mileage of this system (56,293 at January 1, 1954) was far greater than any secondary system for which any other state was wholly responsible. Similarly the 21,530

miles of hard-surfacing on this system exceeded the state responsibility in any other state.

4. There are few states, even those large states where the state and counties share the local road cost burden, where the secondary paved mileage exceeds that in North Carolina, either on a basis of total miles per square mile, or of miles per thousand rural population.

5. On the basis of comparable area and population, North Carolina has more miles of hard-surfaced highways and roads than any other state.

Thus, in the fields of research in roads, development, social advancement and political economy, North Carolina should be able to provide factual answers to many questions concerning the relationships between local road service, and factors of growth and advancement in areas covered by the social sciences. This report is limited to the factors of miles and vehicle-miles of traffic service, and the growth of these factors; plus such correlative data as are immediately available. A section is included presenting growth factors in rural economic and social benefits.

THE STATE SECONDARY SYSTEM

For many years, the Division of Statistics and Planning of the State Highway Commission has regularly compiled data as to the mileage on this system by type, width, location and (by means of extensive traffic count coverage) the volumes of traffic using each short segment of the system.

A complete analysis of this type was made for the years 1947 and 1949, before the advent of the hard-surfacing program of 1949-1953. Thus, there is a valuable background basis for statistical growth comparisons.

A similar study was made for the calendar year 1953 after this extensive improvement program had been substantially completed.

In each case, repeated machine traffic counts were made on from 85 to 95 percent of the segments of road on the entire system during each year. These were expanded by experienced analysts, using data from many full-week-hourly machine counts, repeated four times annually, as expansion factors, with values being finally adjusted by data from 20 full-time yearly-hourly machines. Traffic counts were repeatedly made at more than 18,000 places in each year.

The 24-hour traffic values were computed for each short segment (usually of 1 to 2 miles) on the system, were related, adjusted and posted on large county maps. A "code line" was prepared for each segment, showing system, length, type, and traffic information. Each code line was punched on I. B. M. cards, some 50,000 cards (or segments) being used in the analysis each year. The supervision and checking of the dozen special clerical workers involved prevented all but a minimum of error in the data on the cards.

In effect, then, there are for the whole system "before and after" data in terms of some 50,000 separate segments, analyzed by punch card methods into various groupings for comparisons, relations and trends. The results of these analyses are covered in the following section of this report. It should be stressed that the whole report is limited to the state's secondary rural road system, no highways or streets being included.

State-Wide Traffic Trends

Over-all growth factors in secondary road traffic service are noted from the following (all rural):

Year	Total Miles	Daily [1] Vehicle-Miles	Average Veh. per Day per Mile
1947	50,448	4,386,366	87
1949	51,700	4,620,411	89
1952 [2]	54,273	6,742,447	124
1953	54,800	7,360,288	134

[1] Average 24-hour annual day.

[2] 1952 data expanded from only 80 percent traffic coverage of system.

The same data may be expressed in percentage increase over 1947, as follows:

Year	Miles Percent	Vehicle Miles Percent	Percent Increase In Average
1947	0	0	0
1949	2.5	5.3	2.3
1952[1]	7.6	53.7	42.5
1953	8.6	67.8	54.0

[1]From 80 percent coverage.

The great traffic growth in 1949-1952 was parallel in time with the great increase in hard-surfacing done under the special $200 million bond issue used exclusively for improvements on this secondary system. From January 1, 1949, to December 31, 1952, the mileage of pavement on the system had increased from 5,105 to 18,182.

While this 50.5 percent of increase in average traffic usage (1949-1953) was being registered on secondary roads (that is, 89 to 134 vehicles per day), only 33 percent was noted on major rural state highways in North Carolina. The state-wide increase in taxed gasoline gallons was 39 percent over the same period, which included all travel on the rural primary, secondary and municipal street systems.

If it is assumed that general growth factors accounted for 39 percent, it would appear that the difference between 50 percent and 39 percent, or 11 percent in growth was peculiar to the secondary rural system. This 11 percent net growth was the result of many contributions and influences, as follows:

1. There was an important traffic shift within the system from those roads remaining unpaved to those which had been recently paved. It was noted that the average use of the unpaved was reduced from 51 in 1949 to 42 in 1953. The shift, however, being within the system, did not account for any part of the 11 percent increase previously mentioned.
2. There was some net traffic transfer from the primary system to the secondary system. This was undoubtedly due to primary highway travelers using secondary "short-cuts" to avoid congestion, truck delays, etc. This effect was undoubtedly most pronounced near sizable municipalities.
3. The remainder of the growth must be divided between suburban growth and rural growth. Traffic growth is always associated with population growth, and it is logical to assume the suburban growth to be the greater. The data seem to bear out such an assumption.
4. The residue of perhaps 4 to 6 percent may be indicative of the rural farm-connected traffic growth generated by and attributable to the road improvement program.

It thus appears that the farm traffic generation, due to the extensive secondary road improvement program, was not as great as may have been generally expected or believed. The major traffic effect of the program was qualitative rather than quantitative.

Traffic Trends, Other States

Another method of observation of traffic growth would be in comparison with other states. The great secondary paving program in North Carolina was from 1950 through 1953. No program of comparable magnitude was followed in the adjacent states of Virginia and South Carolina, which states are most similar to North Carolina in agriculture, economy, terrain, and social customs. Comparative data are as follows:

State	Percent Increase Hard-Surfaced Mileage 1949-53[1]	Average Vehicles per Day Entire System 1949	1953	Percent Increase
North Carolina	302	89	134	50.6
Virginia	37	86.6[2]	113[3]	30.9
South Carolina	161	-	-	37.6[4]

[1]BPR Tables SM-2-3; LM-O. [2]Av. 1948-49. [3]Av. 1952-53. [4]15 stations.

TABLE 1

SUMMARY OF 1953 TRAFFIC SERVICE ON RURAL SECONDARY ROADS IN NORTH CAROLINA

Division Number	Types	Vehicles per Average 24-Hour Day in 1953																Total	
		0 - 20		21 - 50		51 - 100		101 - 200		201 - 500		501 - 1,000		1,001-2,000		Over 2,000			
		Mi	V -Mi	Mi	V -Mi	Mi	V -Mi	Mi	V -Mi	Mi	V -Mi	Mi	V -Mi	Mi	V -Mi	Mi	V -Mi	Miles	Veh -Mi
1	Non Hard Surface	389 8	5,715	951 1	37,183	464 4	30,843	61 9	7,599	13 9	3,407	0 5	306	-	-	-	-	1,881 6	85,053
	Hard Surface	4 1	78	39 7	1,691	145 1	12,391	693 1	109,726	555 2	169,978	78 9	50,625	11 6	15,040	-	-	1,527 7	359,529
2	Non Hard Surface	334.8	5,208	938 3	36,506	764 3	53,547	41 4	5,394	13 9	3,883	0 8	561	-	-	-	-	2,093 5	105,099
	Hard Surface	4.9	72	56.3	2,347	120 2	10,098	566 6	91,577	569 8	169,208	120 0	80,892	13 4	17,726	0 9	3,400	1,452 1	375,320
3	Non Hard Surface	320 5	5,097	1,287.1	49,015	596 4	39,584	25 8	4,305	9 1	2,551	0 8	512	-	-	-	-	2,239 7	101,064
	Hard Surface	0 9	16	30 8	1,202	103 4	8,835	572 1	90,981	510 9	148,479	101 5	67,678	20 9	27,689	3.8	11,420	1,344 3	356,300
4	Non Hard Surface	269 7	4,415	1,120 5	44,940	803 2	53,980	89 0	12,484	9 4	3,249	1 4	1,120	0.1	105	-	-	2,293 3	120,293
	Hard Surface	1 8	36	16 4	716	81 6	7,115	832 0	133,262	859 5	253,870	164 9	108,769	27 1	33,038	2 4	5,475	1,985 7	542,281
5	Non Hard Surface	337 9	5,556	1,212 9	48,012	899 4	60,902	114 4	16,622	12 8	3,576	0 4	204	-	-	-	-	2,577 8	134,872
	Hard Surface	2.3	41	13 5	554	110 7	9,027	628 0	100,525	607 6	179,319	175.9	125,249	35 6	48,000	19 6	54,377	1,593 2	517,092
6	Non Hard Surface	305 8	5,203	1,307 1	50,350	601 2	39,642	33 2	4,466	1 8	733	-	-	0 2	230	-	-	2,249 3	100,624
	Hard Surface	0 2	4	24 0	1,010	191 8	16,491	828 5	128,113	620 1	184,010	88 6	62,215	20.5	26,617	7 6	17,965	1,781 3	436,425
7	Non Hard Surface	459 4	7,440	1,325 1	50,210	643 8	44,167	52 0	7,288	12 2	3,866	-	-	-	-	-	-	2,492 5	112,971
	Hard Surface	0 5	10	21 3	977	72 9	6,065	433 0	68,949	503 9	160,252	108 2	74,451	91 3	125,035	13 2	40,447	1,244 3	476,186
8	Non Hard Surface	518 3	8,409	1,649 6	61,474	391 2	25,458	32 2	4,829	6 8	1,986	-	-	-	-	-	-	2,598 1	102,156
	Hard Surface	-	-	214 4	17,948	320 2	26,804	989 9	149,031	558 0	164,882	100.1	68,035	12 5	16,145	6 6	19,086	2,201 7	461,931
9	Non Hard Surface	556 7	8,765	1,232 5	45,615	409.9	26,340	29.3	3,989	13 5	3,833	0 5	276	1 4	2,576	-	-	2,243 8	91,394
	Hard Surface	-	-	49 3	2,376	174 7	14,118	461.0	71,647	542 1	165,618	187 8	129,518	47.4	65,038	33 8	100,530	1,496 1	548,845
10	Non Hard Surface	271 6	4,635	1,225 8	46,448	432 2	28,209	30 7	4,461	4 8	1,200	-	-	0.7	735	-	-	1,965 8	85,688
	Hard Surface	1 6	19	52 3	2,611	285 1	23,550	731 0	112,275	465 8	145,986	162 1	112,351	73 9	104,310	44 1	140,341	1,815 9	641,443
11	Non Hard Surface	1,119 7	16,646	2,188 6	80,203	387 8	24,925	19 6	2,897	8 6	2,678	2 0	1,140	-	-	-	-	3,726 3	128,489
	Hard Surface	2.2	24	26.3	1,241	106 3	9,329	275 1	42,233	280 8	92,103	60 8	41,588	21 0	26,757	1.4	3,416	773 9	216,691
12	Non Hard Surface	383 0	6,874	1,665 0	62,407	504 7	33,835	58 1	7,679	4 4	1,435	-	-	-	-	-	-	2,615 2	112,230
	Hard Surface	-	-	18 4	919	60 9	4,805	523.6	83,066	558 1	178,038	149 2	103,434	69 0	96,164	11 2	26,577	1,390 4	493,003
13	Non Hard Surface	774 8	12,378	1,465 9	52,173	377.1	24,289	24 8	3,326	4 1	1,128	1 1	635	-	-	-	-	2,647 8	93,929
	Hard Surface	0 6	12	17 4	865	132 7	10,944	460 3	71,222	348 7	109,708	120 8	80,578	26 3	34,406	5 1	14,322	1,111 9	322,057
14	Non Hard Surface	1,111 0	16,889	1,345 1	47,219	293 1	18,976	31 0	4,488	0 7	147	-	-	-	-	-	-	2,780 9	87,719
	Hard Surface	-	-	28 2	1,406	110 1	8,982	292.2	44,359	199 4	61,286	38 9	25,727	7 5	9,844	-	-	676 3	151,604
Entire State	Non Hard Surface	7,153.0	113,230	18,914 6	711,755	7,568 7	504,697	643 4	89,827	116 0	33,672	7.5	4,754	2 4	3,646	-	-	34,405 6	1,461,581
	Hard Surface	19 1	312	608 3	35,863	2,015 7	168,554	8,286 4	1,296,966	7,179 9	2,182,737	1,657 7	1,131,110	478 0	645,809	149 7	437,356	20,394 8	5,898,707
	Total	7,172 1	113,542	19,522 9	747,618	9,584 4	673,251	8,929.8	1,386,793	7,295 9	2,216,409	1,665 2	1,135,864	480 4	649,455	149 7	437,356	54,800 4	7,360,288

These relative growth factors show that the North Carolina secondary system travel increased at a considerably higher rate than in these adjacent states. The indications are that the vast paving program in North Carolina was primarily responsible for the difference in rural and suburban traffic growth on secondary roads. While there may have been other minor causes, no other major influence would appear to account for the wide difference in growth rates.

Paved Traffic Service

Considering only hard-surfaced secondary roads, the following data pertain to the state-wide system:

Year	Miles	Daily Vehicle-Miles	Average 24-Hour Daily Vehicles per Mile
1949	5,531	1,880,498	340
1952	18,182	5,054,587	278
1953	20,395	5,898,707	289

The great growth in mileage and in travel is obvious from these figures. The reversing trend in "average vehicles per day per mile" may, at first, appear to be questionable. Actually, it is quite logical. The early 5,531 miles of hard-surfacing were the miles which had been chosen as the most important and most heavily traveled. Generally, they were the major feeders from farm areas to market areas. Their "house per mile" index was high. Rural traffic tended to favor their usage, even though extra travel distance to reach them was involved. Hence, the traffic average was high.

Within three years, the hard-surfaced mileage had been more than tripled. Formerly unpaved roads were now paved—some 12,651 miles of them. Traffic became more dispersed, in that it did not have to seek out the former limited paved sections. Paved mileage grew faster than did system travel. This dispersion materially cut down the average traffic usage of pavement, although total system usage was greatly increased. Then, of course, the mileage selections for paving in the late years of the program were in less populated areas than in the early years, and served less traffic.

The 4 percent net growth in the average 1952-1953 is simply indicative of the general growth in motor vehicles and travel, having been reduced by the same trend of geographic dispersion of traffic.

Extent of Service

Table 1 shows that 80 percent of the total secondary system traffic was using hard-surfaced roads in 1953, as compared to 75 percent in 1952, and only 41 percent in 1949.

This 80 percent of total travel on paved roads appears to be a rather remarkable index of service for a state's "local" road system. No other state provides such extensive local paved road service from state funds. In very few states is such service provided from any or all funds; this is especially true for a state which is primarily agricultural.

As of January 1, 1954, there were only 769 unpaved miles which carried as many as 100 vehicles per day. Only 126 such miles carried more than 200 vehicles per day. These scattered high traffic unpaved segments were mainly in suburban areas. (Many of them have since been paved, during 1954.) Out of 34,405 unpaved miles, the aforementioned 769 represent only 2 percent unpaved serving more than 100 vehicles per day. It is doubted that such a situation prevailed in more than a few states in the nation. Almost a third of these 769 unpaved miles are found in Divisions 4 and 5, containing many extensive suburban sections. (There are 14 divisions in the state.)

Although the average traffic value for hard-surfaced roads was 289 vehicles per day, the majority of the paved mileage was in the service bracket of 100 to 250 vehicles per day, with a median value of less than 200 vehicles per day.

Actually, 2,643 miles, or 13 percent of the hard-surfaced road mileage carried less than 100 vehicles per day. Traffic growth factors will soon materially reduce that percentage, however, with little new pavement being built on lightly traveled sections.

TABLE 2

TRAFFIC SERVICE OF RURAL SECONDARY ROADS IN NORTH CAROLINA DURING 1953 ARRANGED FOR COMPARISON INTO OLD 10 DIVISIONS

Old Division	Non-Hard Surfaced		Hard-Surfaced		Total	
	Miles	Vehicle-Miles[1]	Miles	Vehicle-Miles[1]	Miles	Vehicle-Miles[1]
1	2,572.6	121,728	1,987.5	505,049	4,560.1	626,777
2	2,599.8	127,682	1,868.8	478,113	4,468.6	605,795
3	3,271.6	146,819	1,923.1	502,869	5,194.7	649,688
4	2,741.5	146,206	2,457.7	715,148	5,199.2	861,354
5	3,663.5	174,475	1,690.9	634,702	5,354.4	809,177
6	3,716.1	151,899	3,069.7	699,314	6,785.8	851,213
7	2,738.5	117,610	2,879.6	911,174	5,618.1	1,028,784
8	4,886.3	174,807	1,295.7	478,826	6,182.0	653,633
9	4,065.4	163,291	2,075.6	698,477	6,141.0	861,768
10	4,150.3	137,064	1,146.2	275,035	5,296.5	412,099
Total	34,405.6	1,461,581	20,394.8	5,898,707	54,800.4	7,360,288

[1] Daily vehicle-miles.

Geographical Trends

At the time of the 1949 study, the state was divided into 10 divisions, instead of the present 14 divisions. Hence, the geographical analysis was made in 1949 on the basis of the old 10 divisions. An office fire destroyed the original detail data, and the 1949 data cannot be re-analyzed on the basis of the new 14 divisions.

For comparison, therefore, the 1953 data have been grouped into the old 10 geographical divisions, as shown in Table 2.

The same basic data for 1953 have been combined (Table 3) with the 1949 data for comparison on the old ten division basis. This table shows several geographical trends, as follows:

1. In terms of percentage of total system travel, Old Divisions 6 and 7 ranked highest in 1949, and Old Division 7 was still highest in 1953.
2. In terms of average traffic per mile, Old Division 7 is the highest each year, and Old Division 10 is the lowest.
3. In terms of traffic growth per mile from 1949 to 1953, the "highs" and "lows" are:

Old Division	Percent Growth
2 (Greenville)	81 (High)
7 (Albemarle)	71 (High)
4 (Wilson)	60 (High)
9 (Shelby)	58 (High)
8 (North Wilkesboro)	26 (Low)
6 (Asheboro)	26 (Low)

(See Appendix A for county-by-county data.)

The large comparative growth in traffic in Old Division 2 is undoubtedly attributable to the great growth and mechanization of the leaf tobacco crop in that area, coupled with the post-war enlargements of two major Marine bases, the Morehead Port Terminal, the Du Pont plant, the pulpwood industry, grain culture, and cattle raising. It is noted that system travel in this division grew 81 percent, while the state-wide system growth

was 50 percent. The same influence of tobacco is noted in Old Division 4, but at a lesser rate of growth.

Second place in growth goes to Old Division 7 with 71 percent. Undoubtedly the basis for this high growth rate was associated with the economic developments in Mecklenburg, Cabarrus and Rowan Counties, especially in the great suburban, industrial and residential growth near Charlotte, Concord, Kannapolis, and Salisbury. The major economy of these areas is based on distribution, textile manufacture, and diversified industry.

It is interesting to note that Old Division 6 (Asheboro), in which more secondary road paving work had been done than in any other (3,070 miles total in 1953), had the lowest traffic growth rate of any division. It is thus demonstrated that it is not primarily the paving of local roads which generates traffic, but rather other influences, such as growth of agriculture, business, manufacture, distribution, and population.

In the mountainous divisions, slightly more than average growth (55 percent) was noted in the Old 10th (Asheville). This may be associated with the new industries in the area, the secondary effect of enlarged tourist travel, and increased activity in growth of beef cattle. However, in the rural mountainous Old 8th (North Wilkesboro), the traffic growth on secondary roads was at the lowest level of any state area. It would appear that the forces which have caused traffic growth in other sections were not so prevalent in this area.

These observations would indicate that, although the extensive paving of secondary roads serves and aids in economic growth and social advancement, such a program does not necessarily create such desirable ends within itself. Further research beyond the limits of this report may evaluate such an observation in terms of economic and cultural indices. These observations are also significant in the field of highway economics.

TABLE 3

COMPARATIVE TRAFFIC SERVICE ON NORTH CAROLINA RURAL SECONDARY ROADS BY OLD 10 DIVISIONS, 1949-1953

Old Division	1949 Data				1953 Data				% Growth	
	Total Miles	Daily Veh.-Miles	Ave. Traffic	% Total Travel	Total Miles	Daily Veh.-Miles	Ave Traffic	% Total Travel	Veh.-Miles	Ave. Traffic
1	4,411	406,140	92.1	8.79	4,560	626,777	137.5	8.52	54 3	49.3
2	4,337	325,428	75.0	7.04	4,469	605,795	135.6	8.23	86 2	80.8
3	4,891	408,846	83 6	8.85	5,195	649,688	125.1	8 83	58.9	49.6
4	4,844	502,303	103 7	10.87	5,199	861,354	165.7	11 70	71.5	59.8
5	4,960	523,286	105 5	11.33	5,354	809,177	151.1	10.99	54.6	43.2
6	6,272	624,402	99.6	13 51	6,786	851,213	125.4	11 56	36.3	25.9
7	5,244	562,899	107.3	12 18	5,618	1,028,784	183.1	13.98	82.8	70.6
8	5,909	497,496	84 2	10 77	6,182	653,633	105.7	8.88	31.4	25.5
9	5,832	518,072	88 8	11.21	6,141	861,768	140.3	11.70	66 3	58.0
10	5,002	251,538	50 3	5.45	5,296	412,099	77.8	5.61	63 8	54.7
Total	51,702	4,620,410	89 4	100.00	54,800	7,360,288	134.3	100.00	59.3	50.2

TABLE 4

COMPARATIVE TRAFFIC SERVICE, 1949-1953, ON HARD-SURFACED RURAL SECONDARY ROADS IN NORTH CAROLINA BY OLD 10 DIVISIONS

Old Division	1949 Data				1953 Data				% Growth	
	Total Miles	Daily Veh.-Miles	Ave. Traffic	% Total Travel	Total Miles	Daily Veh.-Miles	Ave. Traffic	% Total Travel	Veh.-Miles	Ave. Traffic
1	686	187,107	272 8	9.95	1,987	505,049	254.2	8 56	169.9	- 6.8
2	360	98,829	274.5	5.26	1,869	478,113	255.8	8.11	383 8	- 6.8
3	623	168,931	271 2	8 98	1,923	502,869	261 5	8 52	197.7	- 3 6
4	691	226,845	328 3	12.06	2,458	715,148	290.9	12 12	215 3	-11.4
5	617	254,974	413.2	13 56	1,691	634,702	375.3	10.76	148.9	- 9.2
6	692	201,512	291 2	10.72	3,070	699,314	227 8	11 86	247.0	-21.8
7	671	253,358	377.6	13.47	2,879	911,174	316.5	15.45	259.6	-16.2
8	453	205,087	452.7	10.91	1,296	478,826	369.5	8.12	133 5	-18.4
9	504	194,136	385.2	10.32	2,076	698,477	336.5	11.84	259.8	-12.6
10	235	89,718	381 8	4.77	1,146	275,035	240.0	4.66	206.6	-37 1
Total	5,532	1,880,497	339.9	100.00	20,395	5,898,707	289.2	100.00	213.7	-14.9

Because road work in North Carolina must be self-supporting, in terms of motor vehicle and fuel tax revenues, it follows that traffic usage is a measure of the ability of a road to pay its way and, therefore, to justify the cost of paving and pavement maintenance. Unless adequate added traffic exists or develops, road improvement costs must be subsidized.

Hard Surfacing

In the same way, growth trends may be observed in geographical areas for hard-surfaced roads only. Table 4 presents the data in areas contained within the Old 10 Divisions.

It is noted that there was a reduction between 1949 and 1953 in all areas in the average traffic per mile on hard-surfaced roads. This has previously been explained as logical, due to the effect of traffic dispersion following the extensive paving program, when the hard-surfaced length was increased from 5,532 to 20,395 miles in the state.

Old Divisions 1, 2 and 3 had minimum reductions, indicating a fairly high degree of efficiency in selection of projects to be paved. The shortage of stone and gravel in these areas, and the correspondingly high cost of paving, undoubtedly acted as a restraining influence and encouraged careful selection in road segments to be paved. Another factor is that in these areas of rather low population intensity (Divisions 1 and 3), the secondary roads are generally rather far apart. Therefore, traffic transfer from one hard-surfaced road to another is more difficult and correspondingly less prevalent than in most of the other divisions. In Old Division 2, the great growth in the tobacco crop, and the attendant farm mechanization, also tended to hold traffic usage at a high level over an increased paved length.

Old Divisions 6 and 10 had great reductions in average hard-surfaced usage. Old Division 6 had the most extensive miles paved of any Division (2,378 miles) during the period, and had a very great reduction in average hard-surfaced usage. The average traffic use per paved mile in 1953 was actually the lowest for any division (228 vehicles per day). It would appear that much of this paving was done on roads in areas of low population, low production, and low traffic potential.

Old Division 10 had the greatest reduction of all in percentage of use. The ratio of old to total paving was quite high (4.9). Several influences may have contributed to the noted reduction in use, as follows:

1. Abundant stone and gravel encouraged extensive paving.
2. With a few exceptions, the area has a low population intensity.
3. Terrain restricts traffic transfer from unpaved to paved roads, due to ridge barriers, cove locations, etc.

Although the foregoing discussion appears "negative" (that is, in terms of growth per mile in traffic usage of hard-surfaced mileage), it should be made clear that the total usage of hard-surfaced roads grew tremendously. On the whole system, in 1953, the daily usage on paved roads had moved up from 1,880,497 to 5,898,707 daily vehicle-miles, or 3.14 times the 1949 total.

Divisions registering the highest total growth factors on hard-surfaced roads were the Old 2nd, 7th and 9th; while the lowest were the Old 5th and 8th.

Qualitative Measure

Perhaps the most qualitative measure of service is the percentage of the system traffic which used hard-surfaced roads (1953). For the state (from Table 2) this is noted as 80 percent. By old, and by new division grouping of counties (Table 2 and Table 1), the percentages are as follows:

By Old Divisions	Percent	By New Divisions	Percent
1	80.6	1	80.9
2	78.9	2	78.1
3	77.4	3	77.9
4	83.0	4	81.8

By Old Divisions	Percent	By New Divisions	Percent
5	78.4	5	79.3
6	82.2	6	81.3
7	88.6	7	80.8
8	73.3	8	81.9
9	81.1	9	85.7
10	66.7	10	88.2
All	80.1	11	62.8
		12	81.5
		13	77.4
		14	63.3
		All	80.1

Using 80 percent as the mean, high values are noted for Old Division 7 and New Division 10 (these cover much of the same territory.) In these areas, more than 88 percent of the system traffic was on hard-surfaced roads. New Division 9 (Winston-Salem) is also high with 86 percent. These are very high values for any area which is mainly rural in nature. Low values are noted for Old Division 10 (67 percent) and New Divisions 14 (63 percent) and 11 (63 percent). These low-value areas are largely mountainous, with little urban influence, low rural population, and limited agriculture. Even so, such percentages are unusual in agricultural or grazing areas anywhere in the nation, especially in mountainous terrain.

It should also be noted that even the unpaved roads generally provide excellent travel service. Being largely stabilized with stone, gravel, sand-clay and other weather-resistant earth types—and being well and regularly maintained—it is rarely that any driver, even in January or February, encounters mud to the extent that tire chains are necessary. There is much truth in the saying: "Muddy cars are never seen in North Carolina."

Width Analysis, Paved

Being essentially a low-traffic system, the secondary roads are almost exclusively of two-lane width. Table 5 is of special value with respect to the paved widths of the system in relation to their traffic service.

Only 524 miles were definitely narrow (that is, 14 feet wide or less) and one-half of these carried less than 110 vehicles per day. At the other end of the width scale, only 189 miles were paved as wide as 24 feet. Distribution of the paved mileage by width is as follows:

Width, ft	Paved Miles	Percent
14 and under	524	2.6
15 - 17	5,406	26.5
18 - 19	11,752	57.6
20 - 21	2,369	11.7
22 - 23	155	0.7
24 - 26	119	0.6
27 and over	70	0.3
All	20,395	100.0

The 15- to 17-foot width bracket is known to be almost altogether of the 16-foot class, many miles being old state highway sections transferred to the secondary system. It is noted that about 26½ percent of the paved system was of this width.

The preponderant width was 18 to 19 feet (known to be almost altogether 18 feet) with 57.6 percent. The other major width was 20 to 21 feet (known to be usually 20 feet) with 11.7 percent.

Thus, it could be said that almost 96 percent of the paved length of the system had from 16 to 20 feet of paved width.

As to paved travel, it may be noted that 1,087,527 vehicle-miles, or 18 percent, was on 16-foot pavement, 3,358,065 vehicle-miles, or 57 percent, was on 18-foot pavement, and 1,129,502 vehicle-miles, or 19 percent, was on 20-foot pavement. This means that 5,575,094 vehicle-miles, or 95 percent, was on 16- to 20-foot widths.

The "typical" paved mile on the system was 18 feet wide and carried from 100 to 300 vehicles per day. Some 38 percent of the paved length of the system fell within these limits, this being the predominant bulk of the paved mileage, and carried 25 percent of the total travel on system pavement.

TABLE 5

STATEWIDE SUMMARY OF 1953 TRAFFIC SERVICE ON RURAL SECONDARY ROADS BY SURFACED WIDTHS, TYPE GROUPS AND TRAFFIC VOLUME GROUPS

Width, ft	Types	Vehicles per Average 24-Hour Day in 1953											Total
		0-20	21-50	51-70	71-100	101-150	151-200	201-300	301-500	501-1,000	1,001-2,000	2,001-3,000	Over 3,000	
		Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi	Mi V -Mi
14 and Under	Non Hard Surface	3,850 2 57,137	6,010 5 217,923	1,089 8 66,144	291 6 24,462	79 8 9,104	23 1 4,270	9 1 2,275	8 2 3,018	0 4 248	---- ----	---- ----	---- ----	11,362 7 384,581
	Hard Surface	2 4 33	54 6 2,563	52 7 3,427	125 1 11,651	155 5 20,136	59 0 10,186	37 6 9,562	12 3 5,109	10 2 6,947	12 2 17,873	2 8 7,900	---- ----	524 4 95,387
15-17	Non Hard Surface	663 4 10,704	2,365 2 91,920	725 3 44,180	259 0 21,468	73 6 9,286	26 6 4,732	19 3 4,657	5 3 1,894	4 0 2,396	0 7 735	---- ----	---- ----	4,142 4 191,972
	Hard Surface	6 6 111	149 6 6,762	280 3 18,426	712 4 64,721	1,575 5 208,924	1,283 7 226,472	828 6 201,962	317 6 116,367	179 0 122,059	56 0 75,434	9 5 21,095	6 8 23,194	5,405 6 1,087,527
18-19	Non Hard Surface	596 9 10,244	2,749 8 104,185	934 1 57,304	283 2 24,133	89 1 11,118	43 3 7,484	10 1 2,694	8 4 3,333	0 4 216	0 2 230	---- ----	---- ----	4,715 5 220,941
	Hard Surface	5 5 88	164 4 7,333	254 8 16,626	678 2 62,116	2,227 1 297,836	2,617 3 468,451	2,855 6 709,025	1,760 7 678,718	865 2 584,945	256 3 350,400	50 6 118,388	16 3 64,139	11,752 0 3,358,065
20-21	Non Hard Surface	573 6 9,720	1,848 7 69,320	495 4 30,637	161 6 13,480	29 3 3,622	11 3 2,070	12 8 3,368	1 8 690	0 4 313	---- ----	---- ----	---- ----	3,134 9 133,220
	Hard Surface	3 1 51	19 2 882	28 7 1,883	33 6 3,142	89 2 12,200	200 6 37,055	519 7 133,260	773 1 301,729	549 1 378,722	121 0 154,634	12 3 30,487	19 3 75,457	2,368 9 1,129,502
22-23	Non Hard Surface	363 4 6,466	1,518 8 57,775	520 9 31,756	139 2 11,438	32 2 3,966	5 7 1,004	3 5 873	0 5 244	1 9 1,400	1 4 2,576	---- ----	---- ----	2,587 5 117,498
	Hard Surface	---- ----	4 8 225	4 5 253	5 6 491	8 3 1,669	33 9 6,351	19 5 5,380	16 7 6,290	18 0 13,383	24 7 35,536	13 9 32,142	4 8 19,650	154 7 121,370
24-26	Non Hard Surface	785 2 13,610	3,164 6 122,394	1,303 3 79,586	394 8 32,890	99 1 12,331	45 4 8,206	19 0 4,551	2 4 1,023	1 7 951	0 1 105	---- ----	---- ----	5,815 6 275,647
	Hard Surface	---- ----	3 7 174	12 1 812	9 6 912	15 3 2,186	8 7 1,573	8 7 2,307	26 6 11,514	19 1 15,415	6 0 9,242	6 3 17,175	2 7 12,500	118 8 73,810
27 and Over	Non Hard Surface	320 3 5,343	1,257 0 48,240	641 8 39,293	324 2 27,434	65 9 8,450	16 0 2,779	16 2 3,808	4 6 1,659	1 2 716	---- ----	---- ----	---- ----	2,647 0 137,722
	Hard Surface	1 5 29	11 1 487	6 7 414	12 3 1,116	7 6 1,037	4 1 740	4 5 1,132	2 9 1,232	13 2 8,013	2 1 3,617	2 2 5,354	2 2 9,875	70 4 33,046
All	Non Hard Surface	7,153 0 113,224	18,914 6 711,757	5,710 4 348,900	1,853 6 155,305	469 0 57,877	171 4 30,545	90 0 22,226	31 2 11,861	10 0 6,240	2 4 3,646	---- ----	---- ----	34,405 6 1,461,581
	Hard Surface	19 1 312	407 4 18,426	639 8 41,841	1,576 8 144,149	4,078 5 543,988	4,207 3 752,828	4,274 2 1,062,628	2,909 9 1,120,959	1,653 8 1,129,484	478 3 646,736	97 6 232,541	52 1 204,815	20,394 8 5,898,707
	Total	7,172 1 113,536	19,322 0 730,183	6,350 2 390,741	3,430 4 299,454	4,547 5 601,865	4,378 7 783,373	4,364 2 1,084,854	2,941 1 1,132,820	1,663 8 1,135,724	480 7 650,382	97 6 232,541	52 1 204,815	54,800 4 7,360,288

Using reasonable values for prevailing widths for each bracket, the total paved area of the system was 211,850,000 square yards (43,771 acres). The weighted average paved width was 17.7 feet. The vastness of these areas is a rough measure of the needs for periodic retreatment and resurfacing which lie immediately ahead.

The paving on this system is almost double that on the primary state highway system, both in area and in miles. Most states operate only a primary system, with the counties and townships caring for all local roads.

Unpaved Road Analysis

The unpaved mileage was very extensive, but had very low traffic volume. Some 63 percent of the system length was unpaved, but the vast majority of this unpaved mileage had some form of surfacing. The average traffic volume on the unpaved was only 42 vehicles per day, and 76 percent of it carried less than 50 vehicles per day.

Only 774 miles of road carrying as much as 100 vehicles per day remained unpaved on January 1, 1954. Although there have since been some traffic increases, some of this unpaved mileage has also since been paved. This 774 miles, then, is both a rough measure of the maximum additional paving needed (that is, 8 miles per county), and an indication of the great paved road traffic service already available on the system. These 774 miles are more likely to be found in suburban than in strictly rural areas.

Table 5, which shows miles and vehicle-miles by width, type group and traffic volume group, is a statewide table. A series of similar tables for each of the 14 divisions will be found in the Appendix. Thus, for any division, observations may be compared with similar data in other divisions.

In spite of the many practical difficulties, it will be noted that there is a good correlation between pavements and traffic volume served, as well as the width of the pavements.

FEDERAL AID SECONDARY PORTION

Up to this point this report has dealt with the entire 54,800-mile rural secondary road system of North Carolina.

A substantial portion of this system was also on the federal aid secondary system (13,771.7 miles, or 25 percent, as of January 1, 1954). This "dual coverage" is often confusing to the lay reader, and has come about by selective designation of thousands of short segments of the state system for the federal system. These 13,771.7 miles were on both systems. In the ensuing discussions this dual coverage is referred to as the "FAS portion." (Note: Vast lengths of the federal aid secondary system are found on the state's primary system, but these mileages are not covered in this report. Also, in this report some 26 miles of federal aid primary system shown on the state secondary road system are ignored, due to the negligible length and to avoid confusion.)

It should be made clear that the federal government does not build, improve, nor maintain this system. Federal aid is available only to aid in major construction, to be matched by state funds, as limited by annual federal aid allocations, with no maintenance or betterment aid whatever. Much of the federal aid system has been built by the state without any federal aid.

The FAS portion, being 25 percent of the state secondary system mileage, has been so selected that it carried 50 percent of the state's secondary system traffic (see Table 6). The FAS portion was 77 percent paved, as compared to 37 percent of the entire state secondary system. This 77 percent paved portion carried 94 percent of the total FAS portion traffic.

Table 6 delineates the FAS portion as related to widths, type groups and traffic volume groups. A marked relationship between paved widths and traffic volumes will be noted, indicating the effect of road selection and pavement design.

Only 1 percent of the paved length was definitely narrow (that is, 14 feet wide or less) and the vast majority of this length carried less than 150 vehicles per day. Only about 1½ percent of the paved mileage was as wide as 22 feet, as follows:

Width, ft	Paved Miles	Percent of Total Paved Mileage
14 and under	116.5	1.1
15 - 17	2,227.4	21.1
18 - 19	6,262.9	59.3
20 - 21	1,794.8	17.0
22 - 23	90.7	0.9
24 - 26	39.8	0.4
27 and over	18.9	0.2
All	10,551.0	100.0

TABLE 6

MILES AND VEHICLE-MILES ON NORTH CAROLINA RURAL SECONDARY ROADS DURING 1953 BY FEDERAL AID SYSTEMS, SURFACE TYPE GROUPS, AND TRAFFIC VOLUME GROUPS

Road Type	System	Vehicles per Average 24-Hour Day in 1953												Total
		0-20	21-50	51-70	71-100	101-150	151-200	201-300	301-500	501-1,000	1,001-2,000	2,001-3,000	Over 3,000	
		Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi	Mi v -mi
Non-Hard Surface	Federal Aid Primary	- -	- -	- -	1 4 105	- -	- -	- -	0 6 258	- -	1 4 2,576	- -	- -	3 4 2,939
	Federal Aid Secondary	46 1 776	1,260 4 54,053	1,080 0 66,729	522 1 43,884	157 5 19,583	92 9 16,482	38 7 9,470	18 3 6,813	4 4 2,488	0 3 335	- -	- -	3,220 7 220,593
	Non Federal Aid	7,106 9 112,448	17,654 2 657,704	4,630 4 282,171	1,330 1 111,336	311 5 38,294	78 5 14,063	51 3 12,756	12 3 4,790	5 6 3,752	0 7 735	- -	- -	31,181 5 1,238,049
	Total	7,153 0 113,224	18,914 6 711,757	5,710 4 348,900	1,853 6 155,305	469 0 57,877	171 4 30,545	90 0 22,226	31 2 11,861	10 0 6,240	2 4 3,646	- -	- -	34,405 6 1,461,581
Hard Surface	Federal Aid Primary	- -	- -	- -	- -	4 9 539	- -	1 6 355	0 8 400	- -	3 6 5,104	11 6 30,832	0 6 2,160	23 1 39,390
	Federal Aid Secondary	1 4 28	18 6 878	98 5 6,386	456 0 42,059	1,562 9 208,280	2,141 6 384,332	2,670 0 667,760	2,141 5 824,760	1,094 9 738,575	294 8 397,483	48 8 113,723	24 0 91,866	10,551 0 3,478,130
	Non Federal Aid	17 7 284	388 8 17,548	543 3 35,455	1,120 8 102,090	3,510 7 335,169	2,065 7 368,496	1,602 6 394,513	767 6 295,799	558 9 390,909	179 9 244,149	37 2 87,986	27 5 110,789	9,820 7 2,383,187
	Total	19 1 312	407 4 18,426	639 8 41,841	1,576 8 144,149	4,078.5 543,988	4,207 3 752,828	4,274 2 1,062,628	2,909 9 1,120,959	1,653 8 1,129,484	478 3 646,736	97 6 232,541	52 1 204,815	20,394 8 5,898,707
Total	Federal Aid Primary	- -	- -	- -	1 4 105	4 9 539	- -	1 6 355	1 4 658	- -	5 0 7,680	11 6 30,832	0 6 2,160	26 5 42,329
	Federal Aid Secondary	47 5 804	1,279 0 54,931	1,176 5 73,115	978 1 85,923	1,720 4 227,863	2,234 5 400,814	2,708 7 677,230	2,159 8 831,573	1,099.3 741,063	295 1 397,818	48 8 113,723	24 0 91,866	13,771 7 3,696,723
	Non Federal Aid	7,124 6 112,732	18,043 0 675,252	5,173 7 317,626	2,450 9 213,426	2,822 2 373,463	2,144 2 382,559	1,653 9 407,269	779 9 300,589	564 5 394,661	180 6 244,884	37 2 87,986	27 5 110,789	41,002 2 3,621,236
	Total	7,172 1 113,536	19,322 0 730,183	6,350 2 390,741	3,430 4 299,454	4,547 5 601,865	4,378 7 783,373	4,364 2 1,084,854	2,941 1 1,132,820	1,663 8 1,135,724	480 7 650,382	97 6 232,541	52 1 204,815	54,800 4 7,360,288

TABLE 7

FEDERAL AND SECONDARY SYSTEM PORTION OF THE NORTH CAROLINA RURAL SECONDARY SYSTEM DURING 1953 BY SURFACED WIDTHS TYPE GROUPS AND TRAFFIC VOLUME GROUPS

Width, ft	Types	Vehicles per Average 24-Hour Day in 1953												Total
		0-20	21-50	51-70	71-100	101-150	151-200	201-300	301-500	501-1,000	1 001-2,000	2,001-3,000	Over 3,000	
		Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi	Mi / V -Mi
14 and Under	Non Hard Surface	19 7 / 335	318 1 / 13,436	186 2 / 11 412	95 2 / 7,993	31 9 / 3,921	10 7 / 1,905	4 5 / 1,136	4 6 / 1,574	0 4 / 248	---- / ----	---- / ----	---- / ----	671 3 / 41,962
	Hard Surface	---- / ----	---- / ----	1 2 / 84	27 9 / 2,885	47 7 / 6,273	18 3 / 3,099	9 4 / 2 711	3 2 / 1,530	0 3 / 180	8 5 / 12,565	---- / ----	---- / ----	116 5 / 29,127
15 - 17	Non Hard Surface	10 4 / 161	151 1 / 6,521	169 1 / 10,504	86 9 / 7,288	24 5 / 3,056	13 1 / 2 369	14 2 / 3,444	3 6 / 1,248	2 0 / 1,140	---- / ----	---- / ----	---- / ----	474 9 / 35,733
	Hard Surface	1 4 / 28	3 5 / 169	34 5 / 2 283	207 9 / 18,932	625 6 / 83,413	644 0 / 114,121	428 6 / 103,942	176 4 / 63,730	85 5 / 44,351	33 1 / 45,810	6 4 / 14,152	0 5 / 1,600	2,227 4 / 493,531
18 - 19	Non Hard Surface	0 3 / 6	265 5 / 11,526	344 7 / 15,018	104 1 / 8 978	27 4 / 3,436	27 9 / 4,788	7 5 / 1 950	4 7 / 1 972	---- / ----	0 2 / 230	---- / ----	---- / ----	682 3 / 47,906
	Hard Surface	---- / ----	15 0 / 704	52 7 / 3,489	198 9 / 18,431	827 7 / 110,135	1,320 3 / 237,541	1,801 7 / 450,581	1,265 2 / 487,673	594 4 / 396,352	151 3 / 208,253	27 3 / 63,635	8 5 / 33,039	6,262 9 / 2,010,023
20 - 21	Non Hard Surface	2 9 / 54	190 8 / 8 080	111 4 / 6,923	66 5 / 5,466	7 8 / 977	5 1 / 982	0 2 / 45	---- / ----	---- / ----	---- / ----	---- / ----	---- / ----	384 7 / 22,527
	Hard Surface	---- / ----	0 1 / 5	5 0 / 344	17 2 / 1 865	58 5 / 7,710	135 1 / 25,065	415 6 / 106,448	665 9 / 259,256	400 8 / 273,188	83 1 / 103,532	5 4 / 13,479	10 0 / 36,287	1,794 8 / 626,977
22 - 23	Non Hard Surface	7 4 / 135	97 0 / 4,112	69 6 / 4,358	21 3 / 1 725	12 5 / 1,543	1 3 / 224	1 5 / 379	0 4 / 196	---- / ----	---- / ----	---- / ----	---- / ----	211 0 / 12,672
	Hard Surface	---- / ----	---- / ----	---- / ----	---- / ----	---- / ----	20 7 / 3,945	10 6 / 2,983	16 0 / 8,972	14 6 / 10,799	15 9 / 23,026	8 1 / 18,192	4 8 / 19 650	90 7 / 84,567
24 - 26	Non Hard Surface	4 8 / 74	172 6 / 7 540	204 0 / 12,644	106 7 / 8 987	27 3 / 3,329	24 7 / 4,495	3 8 / 943	1 6 / 593	1 6 / 896	0 1 / 105	---- / ----	---- / ----	547 2 / 39,706
	Hard Surface	---- / ----	---- / ----	1 5 / 90	---- / ----	3 8 / 541	3 3 / 561	2 5 / 713	14 8 / 6,599	10 9 / 8,863	1 9 / 2,697	1 1 / 3,615	---- / ----	39 8 / 22,779
27 and Over	Non Hard Surface	0 6 / 11	65 3 / 2 834	95 0 / 5,870	41 4 / 3,527	26 1 / 3,319	10 1 / 1,719	7 0 / 1,573	3 4 / 1,130	0 4 / 204	---- / ----	---- / ----	---- / ----	249 3 / 20,187
	Hard Surface	---- / ----	---- / ----	1 6 / 96	4 0 / 356	1 6 / 208	---- / ----	1 6 / 384	---- / ----	8 4 / 4,742	1 0 / 1,600	0 5 / 1,450	0 2 / 1 290	18 9 / 10,126
All	Non Hard Surface	46 1 / 776	1,260 4 / 54,053	1 080 0 / 66,729	522 1 / 43,864	157 5 / 19,583	92 9 / 16,482	38 7 / 9,470	18 3 / 6,813	4 4 / 2,488	0 3 / 335	---- / ----	---- / ----	3,220 7 / 220,593
	Hard Surface	1 4 / 28	18 6 / 878	96 5 / 6,386	456 0 / 42,059	1,562 9 / 208,280	2,141 6 / 394,332	2,670 0 / 667,760	2,141 5 / 824,760	1,094 9 / 738,575	294 8 / 397 483	48 8 / 113,723	24 0 / 91,866	10,551 0 / 3,476,130
	Total	47 5 / 804	1 279 0 / 54,931	1 176 5 / 73,115	978 1 / 85,923	1,720 4 / 227,863	2,234 5 / 400,814	2,708 7 / 677,230	2,159 8 / 831,573	1 099 3 / 741,063	295 1 / 397,818	48 8 / 113,723	24 0 / 91,866	13,771 7 / 3,696,723

The 15- to 17-foot width bracket was almost all 16 feet wide, represented 21 percent of the FAS portion mileage, and carried 14 percent of the total travel. The predominant width of the 18- to 19-foot bracket was almost all 18 feet wide, represented 59 percent of the paved length, and 58 percent of the total travel. Some 97 percent of the paved FAS portion has widths of 16 to 20 feet.

Of the total traffic service of the FAS portion, 492, 531 vehicle-miles, or 14 percent, was on 16-foot pavement, 2, 010, 023 vehicle-miles, or 58 percent, was on 18-foot pavement, and 826, 977 vehicle-miles, or 24 percent, was on 20-foot pavement. This means that 3, 329, 531 vehicle-miles, or 96 percent, was on 16- to 20-foot pavement.

The typical paved mile on the FAS portion was 18 feet wide and carried from 150 to 500 vehicles per day. Some 42 percent of the paved length of the system fell within this traffic bracket, this being the predominant bulk of the paved mileage, and carried 34 percent of the total traffic. The average daily vehicles per mile was 329 on the paved FAS portion. Only a few hundred miles carried more than 1, 000 vehicles per 24-hour day in 1953.

The unpaved segments of the FAS portion are consistently in the lower traffic volume brackets, and had a combined length of 3, 221 miles. The majority of this unpaved length had some form of surfacing (stone, gravel or topsoil) and 90 percent of it carried less than 100 vehicles per day. The grand average volume was only 68 vehicles per day.

Only 312 of the 3, 221 unpaved miles carried more than 100 vehicles per day.

Another feature of the FAS portion lies in the fact that the thousands of short road segments of which it is constituted are connected to each other, or to other federal systems to provide continuity of travel service (see Table 7). (Division tables to which reference has heretofore been made will be found in Appendix A).

EXPENDITURES

The purpose of this report does not include a full accounting of cost and expenditures involved. However, such a report would be incomplete without basic data of this type.

Beginning with the fiscal year which ended June 30, 1946, the expenditures listed in the following table were specifically made on the state's secondary road system. These expenditures are from the State Highway Fund, the only sources of which are state taxation on the motor vehicle and its fuel, plus federal aid. No local county, township, or ad valorem taxes are used for roads in North Carolina.

Fiscal Year Ending June 30	Regular		Special
	Maintenance and Betterments	Construction (Allotments)	From Special $200 Million Bond Issue
1946	$ 20,243,682	$ 1,435,315	
1947	30,491,534	4,990,921	
1948	25,610,397	7,132,052	
1949	30,849,222	7,385,056	
1950	23,717,853	4,861,788	$ 32,226,408
1951	23,460,349	5,574,763	62,456,155
1952	21,912,075	5,540,833	55,501,163
1953	29,240,345	4,850,892	31,858,562
1954	31,346,980	6,228,237	11,034,326
Total	$236,872,437	$47,999,857	$193,076,614
		Grand Total -	$477,948,908

During these nine post-war years the state, with federal aid, spent some $237 million for maintenance and minor improvements; and $241 million in major improvements on the state's secondary road system, of which $193 million was from the special state secondary road bond issue.

The total of about $478 million in nine years for secondary roads alone is more than was spent by many states during that period for all highway and road purposes combined and is an index of the importance attached to secondary roads by the people of North Carolina.

It is noted that the maintenance-betterments item of expenditure increased to more than $31 million in fiscal 1954. With vast lengths of the 20,500 miles of paving each year attaining the 4- to 5-year age when retreatments will become necessary, it is obvious that further substantial increases in custodial cost are to be expected.

RURAL ECONOMIC AND SOCIAL BENEFITS

Although the major service of primary highways is in terms of transportation, the role of improved secondary roads includes many economic, social and cultural values that are generally grouped into the phrase "a better way of life" for rural people.

No one in North Carolina will deny that the extensive secondary road paving program has materially aided in the development of a better way of life for the rural people of the state. Yet, it is impossible exactly to measure the effect of the improved roads; or, in fact, to develop an exact yardstick which would not involve opinion.

Thus, this report does not attempt such evaluations, but simply lists certain contemporary rural improvements which have undoubtedly been served by, if not been made possible by, improved secondary roads. (Further details and sources will be found in Appendix B.) For example, using a four year span (usually 1949 to 1953) it is observed that:

1. Agriculture—Total crop value increased by $160 million, in spite of drought-reduced yields. Also, flue-cured tobacco yield was up 10 percent per acre.
2. Livestock—Production of beef cattle and calves increased about 33 percent. Also, hog cash receipts were substantially higher.
3. Milk—The number of Grade A dairies increased by 68 percent; imports of fluid milk decreased from 53 to 19 million pounds.
4. Poultry—Egg production increased 16 percent; commercial broiler production nearly tripled; despite lower prices per pound, income from broilers more than doubled.
5. Level-of-Living Index—This index for farm families, as compiled by the United States Department of Agriculture, shows that from 1950 to 1954 the North Carolina level of farm living increased by 20.4 percent, while the national increase was only 10.2 percent.
6. Motor Vehicles—From 1950, to 1954, North Carolina's motor vehicle registration

TABLE 8

TRAFFIC SERVICE, 1953, ON NORTH CAROLINA RURAL SECONDARY ROADS BY COUNTIES ARRANGED FOR COMPARISON INTO OLD 10 DIVISIONS

Division	County	Non-Hard Surfaced		Hard-Surfaced		Total	
		Miles	Vehicle-Miles[1]	Miles	Vehicle-Miles[1]	Miles	Vehicle-Miles[1]
1	Bertie	294.8	12,069	196.2	46,774	491.0	58,843
	Camden	85.7	3,691	57.3	13,284	143.0	16,975
	Chowan	67.9	3,130	97.7	22,399	165.6	25,529
	Currituck	74.1	2,104	85.3	16,065	159.4	18,169
	Dare	49.1	1,500	79.1	14,152	128.2	15,652
	Edgecombe	231.1	12,641	259.6	71,419	490.7	84,060
	Gates	167.3	6,736	110.1	20,974	277.4	27,710
	Halifax	395.5	19,792	244.6	73,669	640.1	93,461
	Hertford	196.4	10,598	149.5	55,208	345.9	65,806
	Martin	244.9	11,769	154.1	41,378	399.0	53,147
	Northampton	198.8	10,646	183.4	37,086	382.2	47,732
	Pasquotank	99.3	4,472	100.4	27,654	199.7	32,126
	Perquimans	135.7	7,558	99.8	24,366	235.5	31,924
	Warren	332.0	15,022	170.4	40,621	502.4	55,643
	Total	2,572.6	121,728	1,987.5	505,049	4,560.1	626,777
2	Beaufort	473.0	23,850	187.4	47,000	660.4	70,850
	Carteret	95.3	5,160	138.5	43,465	233.8	48,625
	Craven	299.0	13,017	194.4	41,370	493.4	54,387
	Greene	184.6	9,027	179.4	40,401	364.0	49,428
	Hyde	76.8	2,745	85.9	12,253	162.7	14,998
	Jones	123.5	5,942	118.4	25,904	241.9	31,846
	Lenoir	329.2	17,462	248.9	70,341	578.1	87,803
	Onslow	238.7	11,803	201.9	62,604	440.6	74,407
	Pamlico	120.7	4,563	71.4	13,329	192.1	17,892
	Pitt	468.2	26,078	313.7	93,510	781.9	119,588
	Tyrrell	81.1	2,598	59.4	10,235	140.5	12,833
	Washington	109.7	5,437	69.5	17,701	179.2	23,138
	Total	2,599.8	127,682	1,868.8	478,113	4,468.6	605,795
3	Bladen	342.7	13,392	180.5	34,500	523.2	47,892
	Brunswick	306.1	10,707	172.7	38,115	478.8	48,822
	Columbus	611.0	29,198	279.6	66,749	890.6	95,947
	Cumberland	316.9	14,968	320.6	107,924	637.5	122,892
	Duplin	628.5	29,911	313.4	74,876	941.9	104,787
	New Hanover	25.9	959	133.6	59,217	159.5	60,176
	Pender	297.3	14,505	183.0	40,720	480.3	55,225
	Sampson	743.2	33,179	339.7	80,768	1,082.9	113,947
	Total	3,271.6	146,819	1,923.1	502,869	5,194.7	649,688
4	Franklin	317.2	17,214	235.6	50,293	552.8	67,507
	Johnston	662.1	37,230	467.1	131,380	1,129.2	168,610
	Nash	372.9	16,606	370.3	97,551	743.2	114,157
	Vance	145.0	9,468	152.9	47,486	297.9	56,954
	Wake	612.6	31,664	587.7	220,176	1,200.3	251,840
	Wayne	367.1	18,045	380.3	96,698	747.4	114,743
	Wilson	264.6	15,979	263.8	71,564	528.4	87,543
	Total	2,741.5	146,206	2,457.7	715,148	5,199.2	861,354

TABLE 8 (continued)

Division	County	Non-Hard Surfaced		Hard-Surfaced		Total	
		Miles	Vehicle-Miles[1]	Miles	Vehicle-Miles[1]	Miles	Vehicle-Miles[1]
5	Alamance	452.8	22,334	232.8	78,398	685.6	100,732
	Caswell	324.7	11,987	156.4	38,409	481.1	50,396
	Durham	283.0	14,911	214.4	97,098	497.4	112,009
	Guilford	731.9	34,751	494.4	252,607	1,226.3	287,358
	Granville	479.3	27,028	140.7	37,787	620.0	64,815
	Orange	437.1	20,115	129.1	32,367	566.2	52,482
	Person	408.7	19,565	91.5	23,631	500.2	43,196
	Rockingham	546.0	23,784	231.6	74,405	777.6	98,189
	Total	3,663.5	174,475	1,690.9	634,702	5,354.4	809,177
6	Chatham	546.7	20,323	287.9	64,517	834.6	84,840
	Davidson	513.6	20,965	471.3	130,836	984.9	151,801
	Harnett	381.4	17,305	353.1	102,559	734.5	119,864
	Hoke	173.0	6,554	207.1	39,935	380.1	46,489
	Lee	171.1	8,020	161.6	41,622	332.7	49,642
	Moore	394.6	15,631	298.9	60,571	693.5	76,202
	Randolph	797.7	32,472	380.5	86,635	1,178.2	119,107
	Robeson	597.3	25,761	647.5	124,693	1,244.8	150,454
	Scotland	140.7	4,868	261.8	47,946	402.5	52,814
	Total	3,716.1	151,899	3,069.7	699,314	6,785.8	851,213
7	Anson	349.9	13,659	292.0	43,611	641.9	57,270
	Cabarrus	336.1	17,638	324.5	169,685	660.6	187,323
	Mecklenburg	220.9	8,756	640.3	275,264	861.2	284,020
	Montgomery	216.2	7,644	229.1	33,103	445.3	40,747
	Richmond	158.1	6,644	374.8	87,602	532.9	94,246
	Rowan	398.4	17,634	459.8	149,026	858.2	166,660
	Stanly	397.7	16,784	240.9	55,573	638.6	72,357
	Union	661.2	28,851	318.2	97,310	979.4	126,161
	Total	2,738.5	117,610	2,879.6	911,174	5,618.1	1,028,784
8	Alleghany	331.1	9,421	38.2	6,031	369.3	15,452
	Ashe	572.9	14,477	62.5	7,083	635.4	21,560
	Caldwell	352.6	12,830	146.5	60,666	499.1	73,496
	Davie	263.3	11,996	81.7	20,940	345.0	32,936
	Forsyth	426.1	19,518	374.1	222,661	800.2	242,179
	Stokes	642.4	21,281	109.2	25,382	751.6	46,663
	Surry	634.6	28,071	159.6	51,626	794.2	79,697
	Watauga	366.5	10,547	54.8	8,876	421.3	19,423
	Wilkes	886.0	29,807	160.8	41,784	1,046.8	71,591
	Yadkin	410.8	16,859	108.3	33,777	519.1	50,636
	Total	4,886.3	174,807	1,295.7	478,826	6,182.0	653,633
9	Alexander	300.8	10,627	122.6	28,541	423.4	39,168
	Burke	340.2	13,040	197.4	72,831	537.6	85,871
	Catawba	373.3	17,370	257.6	110,784	630.9	128,154
	Cleveland	587.3	26,068	272.1	85,573	859.4	111,641
	Gaston	322.9	15,250	308.8	145,889	631.7	161,139
	Iredell	693.7	27,634	291.5	78,028	985.2	105,662
	Lincoln	337.2	15,281	137.8	44,188	475.0	59,469
	McDowell	271.6	9,344	126.9	32,194	398.5	41,538
	Polk	255.2	7,809	97.9	19,606	353.1	27,415
	Rutherford	583.2	20,868	263.0	80,843	846.2	101,711
	Total	4,065.4	163,291	2,075.6	698,477	6,141.0	861,768

TABLE 8 (continued)

Division	County	Non-Hard Surfaced Miles	Non-Hard Surfaced Vehicle-Miles[1]	Hard-Surfaced Miles	Hard-Surfaced Vehicle-Miles[1]	Total Miles	Total Vehicle-Miles[1]
10	Avery	171.8	6,477	43.2	6,848	215.0	13,325
	Buncombe	605.4	24,070	363.9	110,211	969.3	134,281
	Cherokee	365.6	12,926	60.0	12,045	425.6	24,971
	Clay	164.7	5,206	33.0	5,142	197.7	10,348
	Graham	148.2	4,732	36.8	6,840	185.0	11,572
	Haywood	273.9	9,828	104.2	28,124	378.1	37,952
	Henderson	475.6	17,071	130.0	47,848	605.6	64,919
	Jackson	332.0	8,298	39.9	7,030	371.9	15,328
	Macon	442.0	13,308	59.5	8,415	501.5	21,723
	Madison	417.3	12,467	74.6	10,974	491.9	23,441
	Mitchell	212.5	7,773	28.5	5,618	241.0	13,391
	Swain	114.4	3,102	56.0	7,294	170.4	10,396
	Transylvania	209.3	5,439	59.0	9,260	268.3	14,699
	Yancey	217.6	6,367	57.6	9,386	275.2	15,753
	Total	4,150.3	137,064	1,146.2	275,035	5,296.5	412,099
	Entire State	34,405.6	1,461,581	20,394.8	5,898,707	54,800.4	7,360,288

[1]Daily vehicle-miles.

per unit of population grew 19 percent, as compared to 11 percent in the nation. (U. S. Census 1950; U. S. Census estimate 1954.)

7. Telephones—The percentage of North Carolina farms with telephone service increased from 8 percent to approximately 17 percent.

8. Rural Electrification—North Carolina rural electrification increased at a more rapid rate than did rural electrification in the nation as a whole. The number of miles of wire, the number of consumers, and the number of farms with electricity showed sizable increases.

9. Health—The percentage of rural births occurring in hospitals increased by about 20 percent.

10. Employment—In 1949, approximately 852,200 persons were employed in non-agricultural work in North Carolina; by 1953, over one million persons were so employed, an increase of 19 percent. During the same period, average weekly wages paid to these workers rose from $40.45 to $47.77, or an 18 percent increase.

11. Education—Enrollment in rural schools increased by 10 percent; but there was a 70 percent decrease, due to consolidation of the number of one and two-teacher rural schools. Of the 100 counties in North Carolina 74 reported increased school attendance. Of 67 counties reporting 61 noted an increase in percentage of miles traveled on hard-surfaced roads by school buses. The percentage of total school bus travel on paved roads increased from 48 to 68. Nineteen counties reported increases of 20 percent or more in hard-surfaced travel by school busses, many showing double such travel.

12. Voting—Sixty-five counties showed increases in number of voters participating in Congressional elections in 1954, as compared with 1950 Congressional elections. The state-wide Presidential vote was up 53 percent.

13. Library Service—Rural library service increased in total book circulation, number of bookmobiles, and number of counties served. Many new rural areas have been opened for bookmobile service as a result of road improvement.

14. Rural Communities—Many rural communities have been organized in order to promote social contact among heretofore relatively isolated rural families, and to facilitate social and cultural improvement projects in rural areas.

15. Birth Rate—North Carolina has had a decreasing birth rate, a good indicator of a rising standard of living and increased wealth.

16. Rural Industry—Each year, approximately 25 percent of new industries locating

in North Carolina have selected rural locations for plant sites.

These are some of the major growth factors on which reliable data are available from state agencies. (See Appendix B for details and other growth indices.) Many other observations could be made in the fields of farm mechanization; use of automatic washers and electric refrigerators; attendance at rural and village movie theaters; laundry service; number and quality of rural cars owned per family; extension of rural athletics and recreation; church attendance; the growth of 4-H Clubs Future Farmers, Grange, Boy Scout enrollment, and other organized rural activities, all indicative of a better life for rural people.

Ignoring the question of impact of taxation, perhaps the only observed adverse effect of the paving program was a relative increase in accident frequency on the secondary system, and especially in terms of fatal accidents. In 1953, and also in 1954, there were about 9 fatal accidents per 100 million vehicle-miles on paved secondary roads, as compared to 4.5 to 8 on paved rural US and NC routes. It is believed that the basic reason was that unfamiliar drivers were following main highway driving habits on paved county roads not designed for highway speeds. Some racing by local youths on these light traffic paved roads may have contributed. Special emphasis is being placed on the use of spot warning signs, and widening of one-way bridges.

This report does not in any way claim that the greatly enlarged mileage of paved roads was wholly responsible for the creation of these elements of improvement in rural life in North Carolina. However, it is a fact that the improvements and the secondary paved road increases were coincidental in time. It is believed and stated by all state agencies involved that the extensive road paving program did materially contribute to these improvements.

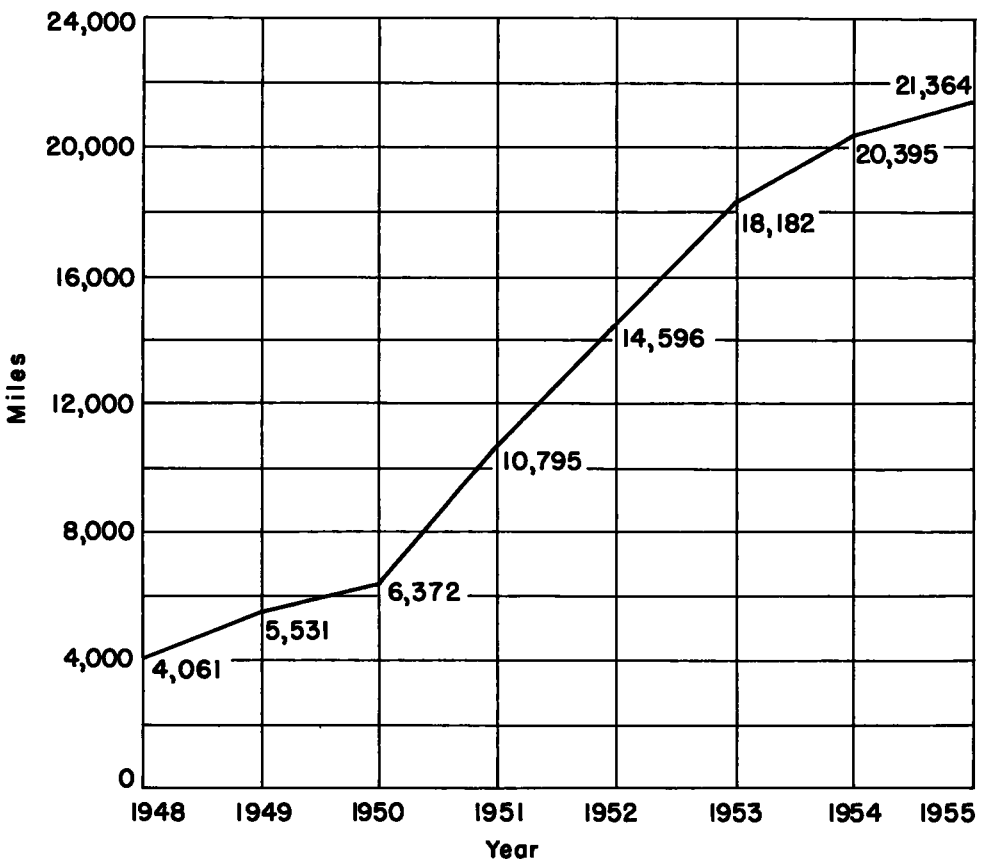

Figure 1. Rural hard-surfaced miles of roadway on North Carolina State Secondary System; total at January 1 each year.

Appendix A

TABLE 9

DIVISION 1, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1
14 & under	Non-hard	173 6	2,555	365 9	14,034	152 1	10,468	23 4	2,307	1 3	325	0 4	248	-	-	-	-	716 7	29,937
	Hard	0 2	3	4 1	185	-	-	13 2	1,863	2 8	1,338	-	-	-	-	-	-	20 3	3,389
15-17	Non-hard	73 4	1,029	227 7	8,921	112 8	7,702	14 0	1,954	5 3	1,247	-	-	-	-	-	-	433 2	20,853
	Hard	3 0	60	22 5	803	114 1	10,034	509 5	79,811	156 2	41,669	11 1	8,692	1 4	1,785	-	-	817 8	142,854
18-19	Non-hard	27 4	411	91 9	3,514	59 8	3,779	11 7	1,562	0 3	150	-	-	-	-	-	-	191 1	9,416
	Hard	0 8	14	10 3	443	31 0	2,357	160 5	26,346	352 1	112,317	43 7	26,742	7 2	9,740	-	-	605 6	177,959
20-21	Non-hard	48 4	748	110 7	4,484	47 4	3,099	3 0	410	-	-	0 1	58	-	-	-	-	209 6	8,799
	Hard	-	-	2 7	255	-	-	8 0	1,402	40 8	13,113	24 1	15,191	-	-	-	-	75 6	29,961
22-23	Non-hard	14 6	216	6 9	274	16 2	995	-	-	-	-	-	-	-	-	-	-	37 7	1,485
	Hard	-	-	0 1	5	-	-	0 5	75	-	-	-	-	3 0	3,515	-	-	3 6	3,595
24-26	Non-hard	21 7	324	73 8	3,003	31 8	1,964	2 7	350	0 4	160	-	-	-	-	-	-	130 4	5,801
	Hard	-	-	-	-	-	-	1 1	187	2 9	1,421	-	-	-	-	-	-	4 0	1,608
27 & over	Non-hard	30 7	432	74.2	2,953	44 3	2,836	7 1	1,016	6 6	1,525	-	-	-	-	-	-	162 9	8,762
	Hard	0 1	1	-	-	-	-	0 3	42	0 4	120	-	-	-	-	-	-	0 8	163
All	Non-hard	389 8	5,715	951 1	37,183	464 4	30,843	61 9	7,599	13 9	3,407	0 5	306	-	-	-	-	1,881 6	85,053
	Hard	4 1	78	39 7	1,691	145 1	12,391	693 1	109,726	555 2	169,978	78 9	50,625	11 6	15,040	-	-	1,527 7	359,529
	Total	393 9	5,793	990 8	38,874	609 5	43,234	755 0	117,325	569 1	173,385	79 4	50,931	11 6	15,040	-	-	3,409 3	444,582

TABLE 10

DIVISION 2, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1
14 & under	Non-hard	102 6	1,464	144 6	5,435	73 9	4,755	0 8	112	-	-	-	-	-	-	-	-	321 9	11,766
	Hard	-	-	5 0	242	1 8	134	8 6	1,288	0 1	25	-	-	-	-	-	-	15 5	1,689
15-17	Non-hard	23 9	357	45 0	1,799	43 3	3,228	2 0	292	1 3	446	0 8	561	-	-	-	-	116 3	6,683
	Hard	2 0	32	23 5	932	77 0	6,424	351 3	55,442	165 2	41,666	14 1	8,868	0 8	1,360	-	-	633 9	114,724
18-19	Non-hard	26 9	424	133 3	5,202	115 8	8,188	8 2	1,035	2 3	721	-	-	-	-	-	-	286 5	15,570
	Hard	0 8	9	21 1	909	34 2	2,904	186 6	31,692	310 1	93,013	52 1	38,181	5 1	6,975	-	-	610 0	173,683
20-21	Non-hard	26 3	432	103 2	4,149	66 6	4,718	6 6	904	4 8	1,454	-	-	-	-	-	-	207 5	11,657
	Hard	1 4	17	3 7	140	-	-	7 5	1,243	76 4	27,882	51 2	32,097	7 3	9,083	0 2	600	147 7	71,062
22-23	Non-hard	17 8	266	63 0	2,398	40 8	2,704	4 3	568	0 4	100	-	-	-	-	-	-	126 3	6,036
	Hard	-	-	-	-	-	-	4 5	720	9 6	2,780	-	-	-	-	-	-	14 1	3,500
24-26	Non-hard	61 7	1,001	132 4	5,239	92 8	6,520	9 0	1,122	3 5	756	-	-	-	-	-	-	299 4	14,638
	Hard	-	-	0 3	13	-	-	2 2	374	8 4	3,842	1 5	1,110	0 2	308	0 7	2,800	13 3	8,447
27 & over	Non-hard	75 6	1,264	316 8	12,284	331 1	23,434	10 5	1,381	1 6	406	-	-	-	-	-	-	735 6	38,749
	Hard	0 7	14	2 7	111	7 2	636	5 9	818	-	-	1 1	636	-	-	-	-	17 6	2,215
All	Non-hard	334 8	5,208	938 3	36,506	764 3	53,547	41 4	5,394	13 9	3,883	0 8	561	-	-	-	-	2,093 5	105,099
	Hard	4 9	72	56 3	2,347	120 2	10,098	566 6	91,577	569 8	169,208	120 0	80,892	13 4	17,726	0 9	3,400	1,452 1	375,320
	Total	339 7	5,280	994 6	38,853	884 5	63,645	608 0	96,971	583 7	173,091	120 8	81,453	13 4	17,726	0 9	3,400	3,545 6	480,419

TABLE 11

DIVISION 3, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1
14 & under	Non-hard	116 9	1,550	189 0	6,798	33 6	2,396	-	-	0 7	294	-	-	-	-	-	-	340 2	10,938
	Hard	-	-	3 6	136	0 9	85	4 9	805	2 9	736	0 2	130	-	-	-	-	12 5	1,892
15-17	Non-hard	25.3	433	152 2	6,149	28 1	1,811	0 9	132	-	-	-	-	-	-	-	-	206 5	8,525
	Hard	-	-	2 4	89	4 5	356	77 5	12,188	20 6	5,830	15 4	11,722	2 5	3,199	-	-	122 9	33,384
18-19	Non-hard	20 6	361	197 2	7,416	41 9	2,809	4 2	479	-	-	-	-	-	-	-	-	263 9	10,865
	Hard	0 2	2	18 9	745	92 6	7,935	465 7	73,995	397 2	112,697	44 9	28,831	9 9	13,285	-	-	1,029 4	237,490
20-21	Non-hard	42 3	709	171 3	6,258	42 4	2,719	8 3	1,774	-	-	-	-	-	-	-	-	264 3	11,460
	Hard	-	-	0 5	21	1 4	114	17 1	2,918	82 2	26,007	37 9	24,521	1 2	1,540	0 5	3,500	140 8	58,631
22-23	Non-hard	62 4	1,103	255 4	10,048	191 1	12,354	1 7	252	0 6	328	-	-	-	-	-	-	511 2	24,085
	Hard	-	-	0 6	15	1 4	105	-	-	3 3	1,386	0 5	450	4 3	5,190	3 3	7,920	13 4	15,066
24-26	Non-hard	35 1	632	263 5	10,182	214 0	14,572	7 8	1,296	5 1	1,236	-	-	-	-	-	-	525 5	27,918
	Hard	-	-	-	-	0 8	60	6 6	1,030	4 7	1,823	2 6	2,024	1 6	2,135	-	-	16 3	7,072
27 & over	Non-hard	17 9	309	58 5	2,164	45 3	3,223	2 9	372	2 7	693	0 8	512	-	-	-	-	128 1	7,273
	Hard	0 7	14	4 8	196	1 8	180	0 3	45	-	-	-	-	1 4	2,340	-	-	9 0	2,775
All	Non-hard	320 5	5,097	1,287 1	49,015	596 4	39,584	25 8	4,305	9 1	2,551	0 8	512	-	-	-	-	2,239 7	101,064
	Hard	0 9	16	30 8	1,202	103 4	8,835	572 1	90,981	510 9	148,479	101 5	67,678	20 9	27,689	3 8	11,420	1,344 3	356,300
	Total	321 4	5,113	1,317 9	50,217	699 8	48,419	597 9	95,286	520 0	151,030	102 3	68,190	20 9	27,689	3 8	11,420	3,584 0	457,364

TABLE 12

DIVISION 4, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	55 9	829	143 8	5,610	38 8	2,638	9 0	1,122	-	-	-	-	-	-	-	-	247 5	10,199
	Hard	-	-	0 3	15	1 7	93	-	-	-	-	-	-	-	-	-	-	2 0	108
15-17	Non-hard	17 8	268	111 9	4,619	96 6	6,716	10 7	1,530	-	-	-	-	-	-	-	-	236 8	13,133
	Hard	-	-	1 0	44	10 8	919	177 9	27,218	81 2	21,422	1 6	1,260	9 6	11,366	-	-	282 1	62,229
18-19	Non-hard	14 4	222	26 6	1,078	34 0	2,284	0 3	42	1 0	290	-	-	-	-	-	-	76 3	3,916
	Hard	0 5	10	13 5	595	65 7	5,805	646 5	104,762	695 3	202,324	113 2	72,870	5 7	7,270	-	-	1,540 4	393,636
20-21	Non-hard	10 8	175	81 8	3,468	62 9	4,391	2 8	357	-	-	-	-	-	-	-	-	158 3	8,391
	Hard	1 3	26	1 3	53	3 4	298	5 3	960	79 4	29,200	45 8	32,300	11 0	13,072	-	-	147 5	75,909
22-23	Non-hard	24 8	439	80 6	3,297	39 7	2,700	5 7	916	0 6	144	1 4	1,120	-	-	-	-	152 8	8,616
	Hard	-	-	-	-	-	-	0 5	60	2 0	540	-	-	0 3	330	2 4	5,475	5 2	6,405
24-26	Non-hard	109 7	1,853	466 3	18,463	326 6	21,290	44 5	6,361	7 2	2,581	-	-	0 1	105	-	-	954 4	50,653
	Hard	-	-	0 3	9	-	-	0 9	135	-	-	-	-	-	-	-	-	1 2	144
27 & over	Non-hard	36 5	629	209 5	8,405	204 6	13,961	16 0	2,156	0 6	234	-	-	-	-	-	-	467 2	25,385
	Hard	-	-	-	-	-	-	0 9	127	1 6	384	4 3	2,339	0 5	1,000	-	-	7 3	3,850
All	Non-hard	269 7	4,415	1 120 5	44,940	803 2	53,980	89 0	12,484	9 4	3,249	1 4	1,120	0 1	105	-	-	2,293 3	120,293
	Hard	1 8	36	16 4	716	81 6	7,115	832 0	133,262	859 5	253,870	164 9	108,769	27 1	33,038	2 4	5,475	1,985 7	542,281
	Total	271 5	4,451	1,136 9	45,656	884 8	61,095	921 0	145,746	868 9	257,119	166 3	109,889	27 2	33,143	2.4	5,475	4,279 0	662,574

TABLE 13

DIVISION 5, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	82 1	1,240	113 7	4,462	74 6	5,203	4 9	656	1 9	471	-	-	-	-	-	-	277 2	12,032
	Hard	-	-	-	-	1 4	126	2 0	360	0 2	98	2 0	1,820	-	-	-	-	5 6	2,404
15-17	Non-hard	39 5	635	137 0	5,416	73 7	4,986	21 0	3,109	2 1	542	-	-	-	-	-	-	273 3	14,688
	Hard	-	-	2 5	86	21 2	1,842	69 3	10,146	18 3	5,292	9 6	6,652	6 6	9,820	4 1	8,778	131 6	42,616
18-19	Non-hard	39 2	652	236 4	9,502	165 2	11,469	40 5	5,960	2 4	707	-	-	-	-	-	-	483 7	28,290
	Hard	2 3	41	10 4	446	72 3	5,985	514 6	82,494	455 9	129,918	84 3	59,548	14 7	19,990	6 2	19,352	1,160 7	317,774
20-21	Non-hard	30 9	455	107 6	3,941	84 5	5,712	1 1	121	0 6	132	-	-	-	-	-	-	224 7	10,361
	Hard	-	-	0 3	10	5 1	360	40.4	7,274	122 9	40,471	65 8	47,283	11 8	13,585	3 8	14,060	250 1	123,043
22-23	Non-hard	16 1	292	100 1	4,183	94 7	6,312	4 8	635	-	-	-	-	-	-	-	-	215 7	11,422
	Hard	-	-	-	-	-	-	-	-	4 4	1,626	7 7	5,436	2 1	4,005	3 8	7,912	18 0	18,979
24-26	Non-hard	103 3	1,850	404 2	16,031	315 1	20,930	32 9	4,954	3 1	775	-	-	-	-	-	-	858 6	44,540
	Hard	-	-	0 3	12	9 0	612	1 7	251	4 5	1,393	3 2	2,194	0 4	600	0 9	2,015	20 0	7,077
27 & over	Non-hard	26 8	432	113 9	4,477	91 6	6,290	9 2	1,187	2 7	949	0 4	204	-	-	-	-	244 6	13,539
	Hard	-	-	-	-	1 7	102	-	-	1 4	521	3 3	2,316	-	-	0 8	2,260	7 2	5,199
All	Non-hard	337 9	5,556	1,212 9	48,012	899 4	60,902	114 4	16,622	12 8	3,576	0 4	204	-	-	-	-	2,577 8	134,872
	Hard	2 3	41	13 5	554	110 7	9,027	628 0	100,525	607 6	179,319	175 9	125,249	35 6	48,000	19 6	54,377	1,593 2	517,092
	Total	340 2	5,597	1,226 4	48,566	1,010 1	69,929	742 4	117,147	620 4	182,895	176 3	125,453	35 6	48,000	19 6	54,377	4,171 0	651,964

TABLE 14

DIVISION 6, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	103 4	1,662	210 7	7,713	31 9	2,020	-	-	-	-	-	-	-	-	-	-	346 0	11,395
	Hard	-	-	-	-	0 9	81	-	-	-	-	-	-	-	-	-	-	0 9	81
15-17	Non-hard	19 3	312	120 7	4,745	75 6	4,984	6 6	908	-	-	-	-	-	-	-	-	222 2	10,949
	Hard	-	-	-	-	15 4	1,320	77 8	11,744	17 3	4,627	0 4	300	0 2	220	3 0	6,660	114 1	24,871
18-19	Non-hard	30 1	538	224 5	8,926	117 5	7,617	4 5	567	0 4	157	-	-	0 2	230	-	-	377 2	18,035
	Hard	-	-	22 7	952	163 5	13,986	683 6	104,713	431 9	121,946	39 9	25,689	10 6	12,902	0 2	420	1,352 4	280,608
20-21	Non-hard	25 5	466	227 3	8,768	105 0	7,012	6 7	1,017	1 0	380	-	-	-	-	-	-	365 5	17,643
	Hard	0 2	4	1 3	58	5 7	492	51 3	8,537	166 9	54,695	37 6	27,272	8 3	11,290	3 3	7,485	274 6	109,833
22-23	Non-hard	35 0	636	178 2	6,774	75 7	4,951	3 9	473	0 4	196	-	-	-	-	-	-	293 2	13,030
	Hard	-	-	-	-	1 8	162	8 9	1,969	1 2	1,342	6 4	5,212	-	-	-	-	18 3	8,685
24-26	Non-hard	85 3	1,460	297 6	11,384	147 2	9,649	1 3	214	-	-	-	-	-	-	-	-	531 4	22,707
	Hard	-	-	-	-	4 2	420	6 7	1,110	2 8	1,400	4 3	3,742	1 4	2,205	1 1	3,400	20 5	12,277
27 & over	Non-hard	7 2	129	48 1	2,040	48 3	3,409	10 2	1,287	-	-	-	-	-	-	-	-	113 8	6,865
	Hard	-	-	-	-	0 3	30	0 2	40	-	-	-	-	-	-	-	-	0 5	70
All	Non-hard	305 8	5,203	1,307 1	50,350	601 2	39,642	33 2	4,466	1 8	733	-	-	0 2	230	-	-	2,249 3	100,624
	Hard	0 2	4	24 0	1,010	191 8	16,491	828 5	128,113	620 1	184,010	88 6	62,215	20 5	26,617	7 6	17,965	1,781 3	436,425
	Total	306 0	5,207	1,331 1	51,360	793 0	56,133	861 7	132,579	621 9	184,743	88 6	62,215	20 7	26,847	7 6	17,965	4,030 6	537,049

TABLE 15

DIVISION 7, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	64 4	858	108 3	4,087	91 6	6,295	5 4	667	3 7	1,295	-	-	-	-	-	-	273 4	13,202
	Hard	-	-	0 5	25	-	-	2 8	415	-	-	-	-	1 4	2,240	-	-	4 7	2,680
15-17	Non-hard	32 9	492	232 2	9,194	104 5	6,937	3 2	412	1 0	264	-	-	-	-	-	-	373 8	17,299
	Hard	-	-	0 6	26	2 1	164	3 5	594	24 7	8,152	9 6	6,210	13 9	20,989	1 1	2,980	55 5	39,115
18-19	Non-hard	127 2	2,310	609 4	22,817	258 8	17,931	33 4	4,505	5 7	1,754	-	-	-	-	-	-	1,034 5	49,317
	Hard	0 3	6	15 8	711	57 4	4,856	356 3	55,198	225 2	69,753	45 7	31,269	40 5	52,806	5 9	14,654	747 1	229,053
20-21	Non-hard	75 7	1,192	101 7	3,898	51 8	3,592	3 8	746	0 1	23	-	-	-	-	-	-	233 1	9,451
	Hard	0 2	4	4 3	210	10 0	753	54 9	9,835	238 7	77,612	49 5	34,925	27 4	36,462	5 3	16,513	390 3	176,314
22-23	Non-hard	26 3	434	45 4	1,734	11 7	769	1 9	229	-	-	-	-	-	-	-	-	85 3	3,166
	Hard	-	-	-	-	1 3	110	14 4	2,712	14 4	4,492	-	-	7 4	11,646	-	-	37 5	18,960
24-26	Non-hard	76 4	1,243	126 5	4,769	73 4	5,032	2 5	500	0 9	290	-	-	-	-	-	-	279 7	11,834
	Hard	-	-	-	-	0 5	50	0 2	50	-	-	-	-	0 7	1,092	0 9	6,300	2 3	7,492
27 & over	Non-hard	56 5	911	101 6	3,711	52 0	3,611	1 8	229	0 8	240	-	-	-	-	-	-	212 7	8,702
	Hard	-	-	0 1	5	1 6	132	0 9	145	0 9	243	3 4	2,047	-	-	-	-	6 9	2,572
All	Non-hard	459 4	7,440	1,325 1	50,210	643 8	44,167	52 0	7,288	12 2	3,866	-	-	-	-	-	-	2,492 5	112,971
	Hard	0 5	10	21 3	977	72 9	6,065	433 0	68,949	503 9	160,252	108 2	74,451	91 3	125,035	13 2	40,447	1,244 3	476,186
	Total	459 9	7,450	1,346 4	51,187	716 7	50,232	485 0	76,237	516 1	164,118	108 2	74,451	91 3	125,035	13 2	40,447	3,736 8	589,157

TABLE 16

DIVISION 8, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	153 7	2,138	264 7	10,335	49 4	3,136	0 9	148	1 9	588	-	-	-	-	-	-	470 6	16,345
	Hard	-	-	1 0	44	1 0	78	-	-	-	-	-	-	-	-	-	-	2 0	122
15-17	Non-hard	103 9	1,683	246 2	8,997	57 4	3,689	1 8	262	-	-	-	-	-	-	-	-	409 3	14,631
	Hard	-	-	8 8	418	304 3	25,391	377 7	55,100	85 6	22,758	6 4	4,006	-	-	-	-	782 8	107,673
18-19	Non-hard	83 5	1,421	411 0	15,728	124 9	8,195	14 2	2,247	2 4	720	-	-	-	-	-	-	636 0	28,311
	Hard	-	-	203 9	17,451	-	-	561 8	85,956	333 6	97,453	49 3	34,147	9 9	12,895	1 4	3,700	1,159 9	251,602
20-21	Non-hard	79 1	1,401	325 9	12,075	43 5	2,813	4 3	625	-	-	-	-	-	-	-	-	452 8	16,914
	Hard	-	-	0 7	35	14 4	1,290	42 4	6,428	136 9	43,968	39 2	25,556	2 1	2,450	4 9	14,186	240 6	93,913
22-23	Non-hard	36 2	686	130 9	4,753	31 0	1,982	1 2	132	-	-	-	-	-	-	-	-	199 3	7,553
	Hard	-	-	-	-	-	-	7 6	1,485	0 6	165	-	-	-	-	0 3	1,200	8 5	2,850
24-26	Non-hard	42 4	737	189 6	6,829	48 6	3,216	4 8	738	1 1	264	-	-	-	-	-	-	286 5	11,784
	Hard	-	-	-	-	-	-	0 3	47	1 2	510	5 2	4,326	0 5	800	-	-	7 2	5,683
27 & over	Non-hard	19 5	343	81 3	2,757	36 4	2,427	5 0	677	1 4	414	-	-	-	-	-	-	143 6	6,618
	Hard	-	-	-	-	0 5	45	0 1	15	0 1	28	-	-	-	-	-	-	0 7	88
All	Non-hard	518 3	8,409	1,649 6	61,474	391 2	25,458	32 2	4,829	6 8	1,986	-	-	-	-	-	-	2,598 1	102,156
	Hard	-	-	214 4	17,948	320 2	26,804	989 9	149,031	558 0	164,882	100 1	68,035	12 5	16,145	6 6	19,086	2,201 7	461,931
	Total	518 3	8,409	1,864 0	79,422	711 4	52,262	1,022 1	153,860	564 8	166,868	100 1	68,035	12 5	16,145	6 6	19,086	4,799 8	564,087

TABLE 17

DIVISION 9, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	314 1	4,647	508 2	18,692	149 5	9,367	9 3	1,164	1 5	456	-	-	-	-	-	-	982 6	34,326
	Hard	-	-	-	-	11 3	1,102	-	-	2 1	795	5 9	3,481	1 4	1,890	-	-	20 7	7,268
15-17	Non-hard	59 8	994	186 9	7,206	75 0	4,708	5 9	858	6 8	1,735	0 1	60	-	-	-	-	334 5	15,561
	Hard	-	-	22 7	1,091	80 7	6,657	208 5	31,870	96 7	26,738	12 9	10,312	2 5	3,292	-	-	424 0	79,960
18-19	Non-hard	47 7	773	153 5	5,477	65 7	4,128	5 9	862	3 1	1,150	0 4	216	-	-	-	-	276 3	12,606
	Hard	-	-	24 0	1,155	73 6	5,710	250 2	39,386	405 3	125,229	147 6	100,802	32 2	44,339	24 5	67,085	957 4	383,706
20-21	Non-hard	49 4	827	90 4	3,272	43 5	3,030	2 1	242	0 9	192	-	-	-	-	-	-	186 3	7,563
	Hard	-	-	0 5	25	3 7	279	1 7	283	35 4	11,916	21 3	14,828	10 1	13,537	4 6	17,305	77 3	58,173
22-23	Non-hard	13 8	259	63 5	2,468	15 5	1,118	3 8	509	1 0	250	-	-	1 4	2,576	-	-	99 0	7,180
	Hard	-	-	-	-	-	-	-	-	-	-	-	-	1 2	1,980	4 0	13,725	5 2	15,705
24-26	Non-hard	37 3	652	115 9	4,386	28 5	1,888	0 4	55	0 2	50	-	-	-	-	-	-	182 3	7,031
	Hard	-	-	0 6	30	0 1	6	-	-	1 7	515	0 1	95	-	-	-	-	2 5	646
27 & over	Non-hard	34 6	613	114 1	4,114	32 2	2,101	1 9	299	-	-	-	-	-	-	-	-	182 8	7,127
	Hard	-	-	1 5	75	5 3	364	0 6	108	0 9	425	-	-	-	-	0 7	2,415	9 0	3,387
All	Non-hard	556 7	8,765	1,232 5	45,615	409 9	26,340	29 3	3,989	13 5	3,833	0 5	276	1 4	2,576	-	-	2,243 8	91,394
	Hard	-	-	49 3	2,376	174 7	14,118	461 0	71,647	542 1	165,618	187 8	129,518	47 4	65,038	33 8	100,530	1,496 1	548,845
	Total	556 7	8,765	1,281 8	47,991	584 6	40,458	490 3	75,636	555 6	169,451	188 3	129,794	48 8	67,614	33 8	100,530	3,739 9	640,239

TABLE 18

DIVISION 10, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																			
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	80 3	1,253	156 3	5,814	50 7	3,319	-	-	-	-	-	-	-	-	-	-	287 3	10,386
	Hard	-	-	11 8	590	17 8	1,398	2 9	376	3 8	858	-	-	0 4	640	2 8	7,900	39 5	11,762
15-17	Non-hard	46 2	815	135 1	5,070	56 1	3,907	4 8	595	1 2	266	-	-	0 7	735	-	-	244 1	11,388
	Hard	1 6	19	32 8	1,640	237 5	19,699	475 4	70,459	132 4	36,295	13 9	9,702	9 4	11,373	8 1	25,871	911 1	175,058
18-19	Non-hard	66 0	1,171	304 6	11,169	104 5	6,563	2 4	357	0 4	158	-	-	-	-	-	-	477 9	19,418
	Hard	-	-	2 9	141	17 8	1,556	245 0	40,256	317 1	104,474	114 6	79,802	54 6	77,581	14 4	41,331	788 4	345,141
20-21	Non-hard	17 1	289	121 6	4,606	25 2	1,709	2 4	382	0 5	150	-	-	-	-	-	-	166 8	7,136
	Hard	-	-	1 4	70	6 2	471	2 3	332	9 5	3,487	31 2	21,229	6 3	9,627	8 3	30,419	65 2	65,635
22-23	Non-hard	10 7	196	169 1	6,353	41 9	2,674	1 2	292	-	-	-	-	-	-	-	-	222 9	9,515
	Hard	-	-	0 6	30	1 6	112	1 5	270	-	-	1 1	693	2 2	3,410	3 7	12,560	10 7	17,075
24-26	Non-hard	46 4	819	278 7	10,906	117 3	7,578	8 7	1,067	0 7	206	-	-	-	-	-	-	451 8	20,576
	Hard	-	-	1 1	55	3 8	289	2 2	290	2 4	682	0 7	553	0 8	1,402	5 2	14,560	16 2	17,831
27 & over	Non-hard	4 9	92	60 4	2,530	36 5	2,459	11 2	1,768	2 0	420	-	-	-	-	-	-	115 0	7,269
	Hard	-	-	1 7	85	0 4	25	1 7	292	0 6	190	0 6	372	0 2	277	1 6	7,700	6 8	8,941
All	Non-hard	271 6	4,635	1,225 8	46,448	432 2	28,209	30 7	4,461	4 8	1,200	-	-	0 7	735	-	-	1,965 8	85,688
	Hard	1 6	19	52 3	2,611	285 1	23,550	731 0	112,275	465 8	145,986	162 1	112,351	73 9	104,310	44 1	140,341	1,815 9	641,443
	Total	273 2	4,654	1,278 1	49,059	717 3	51,759	761 7	116,736	470 6	147,186	162 1	112,351	74 6	105,045	44 1	140,341	3,781 7	727,131

TABLE 19

DIVISION 11, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	1,024 2	15,093	1,723 4	61,424	187 3	11,993	11 0	1,577	4 9	1,370	-	-	-	-	-	-	2,950 8	91,457
	Hard	1 6	18	13 4	582	47 7	4,332	43 8	6,427	6 2	1,650	-	-	-	-	-	-	112 7	13,009
15-17	Non-hard	54 4	885	295 9	12,036	114 8	7,436	4 7	672	3 2	1,088	2 0	1,140	-	-	-	-	475 0	23,257
	Hard	-	-	8 8	440	40 6	3,578	188 9	29,217	134 8	38,584	21 5	13,459	4 9	6,829	-	-	399 5	92,107
18-19	Non-hard	19 7	290	71 1	2,840	48 5	3,153	1 3	208	0 5	220	-	-	-	-	-	-	141 1	6 711
	Hard	0 6	6	3 3	165	17 4	1,377	28 8	4,471	81 3	29,932	31 2	22,338	12 7	15,636	0 7	1,540	176 0	75,465
20-21	Non-hard	16 9	305	76 4	3,064	28 7	1,772	-	-	-	-	-	-	-	-	-	-	122 0	5,141
	Hard	-	-	0 2	10	0 4	24	10 3	1,551	57 5	21,577	7 9	5,621	3 4	4,292	0 7	1,876	80 4	34,951
22-23	Non-hard	0 7	12	7 7	308	2 5	194	-	-	-	-	-	-	-	-	-	-	10 9	514
	Hard	-	-	0 6	44	-	-	2 4	432	1 0	360	-	-	-	-	-	-	4 0	836
24-26	Non-hard	2 3	39	12 4	472	6 0	377	2 6	440	-	-	-	-	-	-	-	-	23 3	1,328
	Hard	-	-	-	-	0 2	18	0 9	135	-	-	0 2	170	-	-	-	-	1 3	323
27 & over	Non-hard	1 5	22	1 7	59	-	-	-	-	-	-	-	-	-	-	-	-	3 2	81
	Hard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All	Non-hard	1,119 7	16,646	2,188 6	80,203	387 8	24,925	19 6	2,897	8 6	2,678	2 0	1,140	-	-	-	-	3,726 3	128,489
	Hard	2 2	24	26 3	1,241	106 3	9,329	275 1	42,223	280 8	92,103	60 8	41,588	21 0	26,757	1 4	3,416	773 9	216,691
	Total	1,121 9	16,670	2,214 9	81,444	494 1	34,254	294 7	45,130	289 4	94,781	62 8	42,728	21 0	26,757	1 4	3,416	4,500 2	345,180

TABLE 20

DIVISION 12, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000		Total	
		M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1	M1	V -M1
14 & under	Non-hard	48 0	781	194 0	7,477	43 9	3,040	8 3	1,324	0 9	360	-	-	-	-	-	-	295 1	12,982
	Hard	-	-	0 4	20	0 8	63	0 9	115	-	-	1 3	1,100	8 5	12,565	-	-	11 9	13,863
15-17	Non-hard	22 1	391	88 4	3,461	28 9	1,987	5 6	703	-	-	-	-	-	-	-	-	145 0	6,542
	Hard	-	-	1 0	50	2 4	201	12 8	1,911	2 6	924	4 3	2,751	-	-	-	-	23 1	5,837
18-19	Non-hard	28 7	506	101 4	3,820	27 7	2,034	2 7	356	-	-	-	-	-	-	-	-	160 5	6,716
	Hard	-	-	11 6	579	48 4	3,866	481 4	76,170	393 7	122,335	54 0	35,784	32 9	50,685	9 7	22,727	1,031 7	312,146
20-21	Non-hard	69 3	1,250	164 4	5,639	21 0	1,373	3 1	355	0 9	457	-	-	-	-	-	-	258 7	9,074
	Hard	-	-	2 0	100	3 9	286	25 3	4,372	156 3	52,913	87 3	62,207	23 3	27,883	-	-	298 1	147,561
22-23	Non-hard	77 0	1,415	342 5	12,409	78 9	5,133	10 4	1,226	-	-	-	-	-	-	-	-	508 8	20,183
	Hard	-	-	2 3	115	3 1	193	1 4	225	-	-	2 3	1,592	3 2	4,160	1 2	3,000	13 5	9,285
24-26	Non-hard	133 4	24,446	740 2	28,392	284 8	18,893	22 4	2,923	0 9	207	-	-	-	-	-	-	1,181 7	52,861
	Hard	-	-	1 1	55	2 3	196	1 0	128	5 5	1,866	-	-	1 1	1,071	0 2	600	11 2	3,916
27 & over	Non-hard	4 5	85	34 1	1,209	19 5	1,375	5 6	792	1 7	411	-	-	-	-	-	-	65 4	3,872
	Hard	-	-	-	-	-	-	0 8	145	-	-	-	-	-	-	0 1	250	0 9	395
All	Non-hard	383 0	6,874	1,665 0	62,407	504 7	33,835	58 1	7,679	4 4	1,435	-	-	-	-	-	-	2,615 2	112,230
	Hard	-	-	18 4	919	60 9	4,805	523 6	83,066	558 1	178,038	149 2	103,434	69 0	96,164	11 2	26,577	1,390 4	493,003
	Total	383 0	6,874	1,683 4	63,326	565 6	38,640	581 7	90,745	562 5	179,473	149 2	103,434	69 0	96,164	11 2	26,577	4,005 6	605,233

TABLE 21

DIVISION 13, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																Total	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000			
		M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1
14 & under	Non-hard	536 1	8,181	811 5	28,577	180 2	11,726	11 4	1,625	0 5	134	-	-	-	-	-	-	1,539 7	50,243
	Hard	0 6	12	7 9	395	46 3	3,823	84 9	12,153	11 5	2,759	4 1	1,748	0 5	538	-	-	155 8	21,428
15-17	Non-hard	81 8	1,343	231 0	8,475	66 9	4,154	7 1	881	2 6	732	1 1	635	-	-	-	-	390 5	16,220
	Hard	-	-	5 1	252	32 7	2,593	132 3	20,810	97 3	29,896	48 2	31,421	4 2	5,202	-	-	319 8	90,174
18-19	Non-hard	40 3	730	149 0	5,324	46 3	3,051	3 1	422	-	-	-	-	-	-	-	-	238 7	9,527
	Hard	-	-	3 6	178	50 8	4,303	220 5	34,255	173 0	52,484	25 1	16,171	15 0	20,109	3 9	11,718	491 9	139,218
20-21	Non-hard	64 0	1,152	134 9	4,682	28 0	1,723	2 5	283	-	-	-	-	-	-	-	-	229 4	7,840
	Hard	-	-	0 8	40	1 7	124	21 3	3,760	65 0	23,946	42 3	30,105	6 6	8,557	-	-	137 7	66,532
22-23	Non-hard	24 2	439	56 0	2,061	15 7	1,022	0 2	30	0 3	87	-	-	-	-	-	-	96 4	3,639
	Hard	-	-	-	-	0 3	18	0 5	72	0 5	222	-	-	-	-	-	-	1 3	312
24-26	Non-hard	24 7	459	49 8	1,861	16 7	1,062	-	-	-	-	-	-	-	-	-	-	91 2	3,382
	Hard	-	-	-	-	0 7	67	0 8	172	0 6	219	0 6	830	-	-	-	-	2 7	1,288
27 & over	Non-hard	3 7	74	33 7	1,193	23 3	1,551	0 5	85	0 7	175	-	-	-	-	-	-	61 9	3,078
	Hard	-	-	-	-	0 2	16	-	-	0 8	182	0 5	303	-	-	1 2	2,604	2 7	3,105
All	Non-hard	774 8	12,378	1,465 9	52,173	377 1	24,289	24 8	3,326	4 1	1,128	1 1	635	-	-	-	-	2,647 8	93,929
	Hard	0 6	12	17 4	885	132 7	10,944	460 3	71,222	348 7	109,708	120 8	80,578	26 3	34,406	5 1	14,322	1,111 9	322,057
	Total	775 4	12,390	1,483 3	53,038	509 8	35,233	485 1	74,548	352 8	110,836	121 9	81,213	26 3	34,406	5 1	14,322	3,759 7	415,986

TABLE 22

DIVISION 14, TRAFFIC SERVICE IN 1953, NORTH CAROLINA RURAL SECONDARY ROADS

Width ft	Surface Type	Vehicles per Average 24-Hour Day in 1953																Total	
		0-20		21-50		51-100		101-200		201-500		501-1,000		1,001-2,000		Over 2,000			
		M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1	M1	V-M1
14 & under	Non-hard	994 9	14,889	1,076 4	37,463	223 9	14,350	18 5	2,871	-	-	-	-	-	-	-	-	2,313 7	69,373
	Hard	-	-	6 6	330	46 2	3,762	50 5	6,520	16 2	4,664	0 8	416	-	-	-	-	120 3	15,692
15-17	Non-hard	63 3	1,067	155 0	5,833	50 6	3,403	12 3	1,793	0 7	147	-	-	-	-	-	-	281 9	12,243
	Hard	-	-	17 9	891	49 4	3,969	196 8	30,886	113 3	34,475	10 0	6,704	-	-	-	-	387 4	76,925
18-19	Non-hard	25 2	437	39 9	1,371	6 7	435	-	-	-	-	-	-	-	-	-	-	71 8	2,243
	Hard	-	-	0 3	15	10 4	951	42 9	6,593	44 1	13,617	20 1	13,021	5 3	6,387	-	-	123 1	40,584
20-21	Non-hard	17 9	322	31 5	1,015	6 5	453	-	-	-	-	-	-	-	-	-	-	55 9	1,790
	Hard	-	-	1 9	95	4 0	294	2 0	360	24 9	8,202	8 0	5,586	2 2	3,457	-	-	43 0	17,994
22-23	Non-hard	3 8	72	19 5	716	4 7	286	-	-	-	-	-	-	-	-	-	-	28 0	1,074
	Hard	-	-	1 2	60	-	-	-	-	0 2	57	-	-	-	-	-	-	1 4	117
24-26	Non-hard	5 5	94	13 7	476	-	-	0 2	24	-	-	-	-	-	-	-	-	19 4	594
	Hard	-	-	-	-	0 1	6	-	-	-	-	-	-	-	-	-	-	0 1	6
27 & over	Non-hard	0 4	8	9 1	345	0 7	49	-	-	-	-	-	-	-	-	-	-	10 2	402
	Hard	-	-	0 3	15	-	-	-	-	0 7	271	-	-	-	-	-	-	1 0	286
All	Non-hard	1,111 0	16,889	1,345 1	47,219	293 1	18,976	31 0	4,488	0 7	147	-	-	-	-	-	-	2,780 9	87,719
	Hard	-	-	28 2	1,406	110 1	8,982	292 2	44,359	199 4	61,286	38 9	25,727	7 5	9,844	-	-	676 3	151,604
	Total	1,111 0	16,889	1,373 3	48,625	403 2	27,958	323 2	48,847	200 1	61,433	38 9	25,727	7 5	9,844	-	-	3,457 2	239,323

Appendix B

Rural Telephone Service

U. S. Farm Census, 1945: 5 percent of North Carolina farms had telephone service.

U. S. Census, 1950: 8. 1 percent of North Carolina farms had telephone service.

As of January 1, 1955, 17 percent of North Carolina farms had telephone service according to the best estimate available by the North Carolina Rural Electrification Authority.

Data supplied by:
Gwyn B. Price, Director
North Carolina Rural Electrification Authority

Rural Library Service

From June 30, 1949 to June 30, 1953, library service in rural North Carolina expanded as follows:

	June 30, 1949	June 30, 1953
Total book circulation	7,478,950	10,723,834
Number of bookmobiles	83	90
Counties served	87	91
Financial resources	$1,525,378	$1,894,325

In 1949, bookmobiles were ½-ton panel-type trucks. Road improvement has permitted the replacement of many of these with larger 1- or 2-ton walk-in bookmobiles.

The road improvement program has opened new rural areas for bookmobile service.

Data supplied by:
Mrs. Elizabeth H. Hughey, Secretary-Director North Carolina Library Commission.

Organized Rural Communities

In the Asheville area there has been in recent years a movement among rural people to organize rural communities in order to promote better living for the families involved. These rural organizations provide social activities, educational programs, and community improvement projects once or twice a month. Their purpose is to enable rural people to get together with their neighbors, something that was earlier left to chance.

Dr. C. Horace Hamilton of N. C. State College believes that the rural road program in North Carolina has facilitated the formation of these rural community organizations.

Sample projects undertaken include: mail box painting, organization of the little theater group, landscaping of local properties, providing recreation areas for young people, remodeling of local churches, providing housing for victims of fires, and obtaining telephone service for the community.

These organizations seek to raise the level of living among rural families by increasing the opportunities for social contact for these families.

Data from:
Selz C. Mayo
"Organized Rural Communities,"
N. C. State College, (April 1954)

Birth Rate

North Carolina's birth rate decreased from 1949 through 1954.

Dr. Hamilton of N. C. State College stated that a lowering birth rate is a sign of a rising standard of living and increased wealth.

Voting 1950 and 1954:

In the 1950 and 1954 Congressional elections, 65 counties showed increases in number of voters taking part in elections.

In the 1948 Presidential election, 791,209 votes were cast in North Carolina; in the 1952 election 1,210,910 votes were cast.

Data from: 1955
North Carolina Manual

Rural Electrification

In 1949, 70.3 percent of North Carolina farms had electric service. By July 1954, 96.9 percent of North Carolina farms were receiving electric service. The corresponding figures for all U.S. farms were 78.2 percent and 92.3 percent, respectively. North Carolina's increase in rural electrification was above that of the nation as a whole.

Other figures on rural electrification include the following (cumulative to end of year indicated):

	1949	1954
Total miles constructed	58,277	77,095
Total consumers converted	367,323	530,476
Estimated farms converted	202,000	279,685

Data from:
Rural Electrification in North Carolina, 1954 Report, Rural Electrification Authority of the State of North Carolina

Rural Births and Deaths in Hospitals

From 1948 to 1954, there was an increase in the percentage of rural births and deaths occurring in hospitals. In 1948, 32.6 percent of white rural deaths and 19.1 percent of negro rural deaths occurred in hospitals. In 1953, percentages were 38.5 and 29.3 respectively.

The percentage of rural births in hospitals showed a greater increase than did the percentage for deaths. In 1948, 74.7 percent of all rural white births occurred in hospitals. This figure rose to 93.4 percent by 1953. In 1949, 22 percent of all rural negro births were in hospitals. By 1953, this figure had doubled; 44 percent of rural negro births took place in hospitals.

In 1953, there were 161 hospitals in North Carolina and 84 of the 100 counties had hospitals. There is a trend toward construction of small health and medical centers in rural North Carolina communities.

Data from:
Dr. C. Horace Hamilton,
Professor Rural Sociology,
N. C. State College

Non-Agricultural Employment

In 1949, approximately 852,200 people were employed in non-agricultural work in North Carolina. In 1953, approximately 1,010,700 were so employed. Average weekly earnings of workers so employed rose from $40.45 in 1949 to $47.77 in 1953. There was an increase in number of employed and average weekly earnings every year from 1949 to 1953.

Data supplied by:
North Carolina Department of Labor

Level-of-Living Index for Farm Families

From 1950 to 1954, the percentage increases in the level-of-living index for farm families were as follows:

North Carolina	20.4
South Atlantic States	18.3
United States	10.2

There were six states having a higher value of increase than North Carolina, and 41 states having a lower increase in index during this period. The index is based on farm families with electricity, telephones, automobiles, and value of products sold.

Data from:
Farm-Operator Family
Level-of-Living Indexes
For States, 1950-1954. U.S. Department of Agriculture, Agricultural Marketing Service May 1955

Agriculture

Total acreages of harvested crops during 1954 fell somewhat below totals for 1949 by approximately 380,000 acres. The 1949 weather conditions were excellent, whereas 1954 was the third successive drought year. Total crop value in 1954 exceeded 1949 crop value by $160 million because per-unit values placed upon crops harvested were generally higher in 1954 than in 1949.

In 1949, receipts from livestock and livestock products accounted for 20.4 percent of total receipts. In 1954, this proportion increased to 23.2 percent.

In 1954, yields of small grains were good.

	Bushels per Acre	
	1949	1954
Wheat	13.8	22
Oats	28.5	39
Barley	26	34

In 1949, 31 percent of the state's corn acreage was hybrid corn. By 1954 this percentage had risen to 46.5 percent. North Carolina Crop Reporting Service says that, had climatic conditions in 1954 been comparable to those of 1949, per-acre yield might well have exceeded 40 bushels, compared to 1949 yield of 31.5 percent bushels.

In 1954, the increase of all types of flue-cured tobacco was 120 pounds per acre, about 10 percent more than 1949 per acre yield. Burley tobacco yield per acre was almost 500 pounds above 1949.

Peanut harvest in 1954 was affected by drought conditions. Per-acre yield was below the 1952 record yield, but exceeded 1949 yield by 410 pounds.

Production of cattle and calves in 1954 was about one-third more than in 1949. Prices received in 1954 were lower than in 1949, so that cash receipts in 1954 were only about 10 percent above 1949 totals. Cash receipts from sale of hogs were substantially above 1949.

Average number of milk cows on farms in 1954 is higher than in 1949, as is production per milk cow and total production of milk. Grade A dairies numbered 3,083 in 1949 and 5,183 in 1954. Purchases from these producers amounted to approximately 340 million pounds in 1949; in 1954 approximately 665 million pounds of milk were purchased from these producers. Imports of fluid milk were reduced from 53 million pounds in 1949 to 18,700,000 pounds in 1954.

Although production of chickens in farm flocks has trended downward, inventories of laying hens were maintained and rate of lay increased so that egg production in 1954 was 16 percent in excess of 1949 production. Commercial broiler production in 1954 was more than 2¾ times 1949 production. 1954 prices per pound were below those of 1949, but income from broilers in 1954 was more than double that for 1949.

About 300,000 North Carolina families get all or part of their income from poultry work of some sort. More than any other agricultural activity, the poultry industry is dependent on daily transportation of feed, eggs, and chicks. This daily transportation is wholly dependent on highways. Dr. Roy Dearstyne of N.C. State College Poultry Department states that more people are going into poultry work because more good roads have made it possible for more rural people to find this part of agriculture profitable. Dr. Dearstyne said: "Roads have been invaluable because of the amount of trucking and hauling that has to be done. Without good roads, the poultry industry would not be near its present strength. The development of roads in the last ten years is primarily responsible for the development of the poultry industry in North Carolina."

Dr. Dearstyne estimated that improved roads had increased the efficiency of county poultry extension workers by one-third.

Data supplied by:
Henry L. Rasor,
Agricultural Statistician, N. C. Crop Reporting Service; and
Dr. Roy Dearstyne, N. C. State College.

Schools, Buses

During the 1949-50 school year, approximately 48 percent of school bus travel was on hard-surfaced roads. During the 1953-54 school year, approximately 68 percent of school bus travel was on hard-surfaced roads. Of 67 counties reporting number of miles traveled on hard-surfaced and non-hard surfaced roads during the two school years, 61 reported increased percentages of travel on hard-surfaced roads. North Carolina transports more school children, more miles, in more school buses, than does any other state.

Counties showing greatest increases in percent of hard-surfaced road travel by school buses are as follows:

	County	1949, Percent	1954, Percent
1.	Bertie	33.5	79.4
2.	Brunswick	39.2	73.0
3.	Cabarrus	10.7	39.5
4.	Chowan	52.9	88.5
5.	Cumberland	48.0	80.7
6.	Graham	44.6	74.2
7.	Greene	30.2	66.6
8.	Hoke	33.8	83.0
9.	Hyde	56.6	88.2
10.	Northampton	41.3	82.0
11.	Onslow	36.2	85.6
12.	Perquimans	37.1	71.5
13.	Rowan	34.8	81.4
14.	Sampson	27.7	63.6
15.	Scotland	45.1	91.8
16.	Tyrrell	23.5	92.5
17.	Washington	41.4	70.4
18.	Wilson	34.0	65.0
19.	Yancey	5.8	50.1

Schools, Attendance

From the 1948-49 school year to the 1953-54 school year there was a very slight improvement in percentage of attendance of students in rural schools, from 92.2 percent to 92.7 percent. White attendance declined from 93.45 percent to 93.29 percent; regular attendance rose from 89.3 percent to 91.1 percent.

Seventy-four counties reported increased percentages of attendance for white pupils; 72 counties reported increased negro attendance.

While the average daily enrollment in rural schools increased from 596,327 in 1949 to 658,499 in 1954, the number of one- and two-teacher rural schools decreased from 917 in 1949 to 288 in 1954. In 1954 there were 36 counties that had no one- or two-teacher rural schools; in 1949 only 7 counties had no one- or two-teacher schools.

Data derived from information supplied by:
Department of Public Instruction,
State of North Carolina

Rural Industries

With the unexcelled good roads system of the state, most types of industry can readily locate in rural areas. In fact, many industries now specify sites outside incorporated towns. Only a limited number, it is believed, cannot operate successfully in rural communities.

In 1949, 40 out of 153 new industries in North Carolina were rural as far as physical location was concerned; that is, they were located in rural areas or in towns of less than 2,500 inhabitants. In 1953, 37 out of 151 new industries were rural; in 1954, 35 out of 138 were rural.

Employees for rural industries come from nearby urban areas and from the surrounding country areas. The North Carolina Board of Farm Organizations and Agencies recommends that members of farm families on marginal producing farms work in rural industries. Thirty-eight percent of North Carolina farms averaged less than $100 per capita cash income in 1950. It is this group that is in most need of additional employment. Good roads are a necessity.

The Board of Conservation and Development lists the following industries as especially suitable for rural communities:

1. Corn shucking and shelling.
2. Feed mills.
3. Potato washing, grading, and packing.
4. Meat packing.
5. Canneries.
6. Flour mills.
7. Preserving.
8. Poultry dressing and processing.
9. Seafoods.
10. Forest products.
11. Dairy products.
12. Mining and mineral processing.
13. Farm machinery.

In 1949, employment of workers in food processing and kindred industries averaged 17,971 persons per month. In 1954, 21,627 persons were employed in these industries.

North Carolina has several hundred medium and small sized food processing plants. Many of them are in rural areas where job opportunities are most urgently needed.

Hammarlund, Sprague Electric, International Resistance, and Westinghouse are a few of the electronics and electrical products companies developing plants in rural areas of North Carolina since 1949.

Appendix C

COMPARISON OF ROAD SERVICE WITH OTHER STATES

Because of varying terrain, development, and intensity of population, it is difficult to compare one state with another in terms of quantity or quality of road service. How may Rhode Island be compared with Utah, or New Jersey with Texas? How much weight should be given to area service in relation to population served?

The following basis for comparison should be satisfactory, although it is admittedly only one of many methods and is acknowledged to be lacking in some respects, especially from the qualitative standpoint. It results in top ranking for North Carolina, in terms of a quantitative paved mileage index. Any other reasonable index would show North Carolina at, or very near, the top in state rankings of rural paved mileage.

As of January 1, 1954, the most recent date of official available data for all states (U. S. Bureau of Public Roads Table M-3), there were only nine states in the nation which had more miles of hard-surfaced highways and roads per unit of area than North Carolina. These states, and their rural paved miles per 100 square miles, were:

Connecticut	173.5
New Jersey	118.6
Delaware	110.6
Maryland	105.7
Ohio	102.5
Rhode Island	102.5
New York	97.7
Pennsylvania	89.3
Massachusetts	83.5
North Carolina	63.7

All of those nine states, however, had a greater intensity of (1950) population per square mile than did North Carolina, in almost all cases having more than double North Carolina's population intensity. Furthermore, all except New York had a higher rural population intensity than North Carolina.

Therefore, on the basis of comparative area and population, North Carolina has more miles of hard-surfaced highways and roads than any other state.

THE NATIONAL ACADEMY OF SCIENCES—NATIONAL RESEARCH COUNCIL is a private, nonprofit organization of scientists, dedicated to the furtherance of science and to its use for the general welfare. The ACADEMY itself was established in 1863 under a congressional charter signed by President Lincoln. Empowered to provide for all activities appropriate to academies of science, it was also required by its charter to act as an adviser to the federal government in scientific matters. This provision accounts for the close ties that have always existed between the ACADEMY and the government, although the ACADEMY is not a governmental agency.

The NATIONAL RESEARCH COUNCIL was established by the ACADEMY in 1916, at the request of President Wilson, to enable scientists generally to associate their efforts with those of the limited membership of the ACADEMY in service to the nation, to society, and to science at home and abroad. Members of the NATIONAL RESEARCH COUNCIL receive their appointments from the president of the ACADEMY. They include representatives nominated by the major scientific and technical societies, representatives of the federal government, and a number of members at large. In addition, several thousand scientists and engineers take part in the activities of the research council through membership on its various boards and committees.

Receiving funds from both public and private sources, by contribution, grant, or contract, the ACADEMY and its RESEARCH COUNCIL thus work to stimulate research and its applications, to survey the broad possibilities of science, to promote effective utilization of the scientific and technical resources of the country, to serve the government, and to further the general interests of science.

The HIGHWAY RESEARCH BOARD was organized November 11, 1920, as an agency of the Division of Engineering and Industrial Research, one of the eight functional divisions of the NATIONAL RESEARCH COUNCIL. The BOARD is a cooperative organization of the highway technologists of America operating under the auspices of the ACADEMY–COUNCIL and with the support of the several highway departments, the Bureau of Public Roads, and many other organizations interested in the development of highway transportation. The purposes of the BOARD are to encourage research and to provide a national clearinghouse and correlation service for research activities and information on highway administration and technology.