

# MAINE STATE LEGISLATURE

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FEASIBILITY STUDY  
FOR AN  
**EXPRESS HIGHWAY**  
THROUGH  
**WASHINGTON COUNTY,**  
**MAINE**



Prepared for the  
Maine State Highway Commission  
By  
Edwards and Kelcey, Inc.,  
Consultants.



COMMISSIONERS

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# Maine State Highway Commission

AUGUSTA, MAINE 04330

January 9, 1969

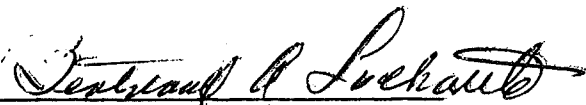
To the Honorable Senate and  
House of Representatives of the  
One Hundred and Fourth Legislature -

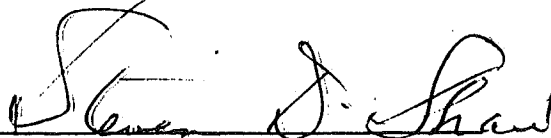
In accordance with the wishes of the 103rd Maine Legislature as expressed in the provisions of LD 1339, entitled AN ACT TO PROVIDE A FEASIBILITY STUDY FOR EXPRESS HIGHWAY THROUGH WASHINGTON COUNTY, the State Highway Commission herewith submits the enclosed report which has been prepared by Edwards and Kelsey, Inc., Consultants. Documentation of the feasibility and cost estimates for each of the three proposals studied are indicated in the report.

Respectfully,

MAINE STATE HIGHWAY COMMISSION

  
David H. Stevens, Chairman

  
Bertrand A. Lacharite

  
Steven D. Shaw

EDWARDS AND KELCEY, INC.

ENGINEERS AND CONSULTANTS

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AREA CODE 617-542-4576

December 10, 1968

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Mr. David H. Stevens, Chairman  
Maine State Highway Commission  
Planning and Traffic Division  
Augusta, Maine 04330

Attention: Mr. Roger L. Mallar  
Planning and Traffic Engineer

Gentlemen:

In accordance with our agreement of March 27, 1968 we are pleased to submit this report with our findings and recommendations on the feasibility of constructing an express highway through Washington County linking Washington County with the present Interstate Highway System and Canada. In addition to assessing the total traffic demand of the region, this study is based on such economic factors as the location of inhabited areas, the location of recreational areas, and the geographic and economic relationship of the county to Canada and to neighboring counties.

We appreciate the opportunity to have conducted this study and acknowledge with thanks the assistance given us by many members of your Commission, other state agencies, and the municipalities involved.

Very truly yours,

EDWARDS AND KELCEY, INC.



Gordon L. Kirjassoff  
Executive Vice President

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FEASIBILITY STUDY FOR AN  
EXPRESS HIGHWAY THROUGH  
WASHINGTON COUNTY IN THE STATE OF MAINE

Prepared For

THE MAINE STATE HIGHWAY COMMISSION  
AUGUSTA, MAINE

By

EDWARDS AND KELCEY, INC., CONSULTANTS  
BOSTON, MASSACHUSETTS

MAINE STATE HIGHWAY COMMISSION

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1. - INTRODUCTION

In 1967 the State of Maine approved an Act which authorized the State Highway Commission to conduct a study dealing with the feasibility of building an express highway into and through Washington County, linking the present Interstate Highway with Canada. This legislation is reproduced below.

## STATE OF MAINE

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IN THE YEAR OF OUR LORD NINETEEN HUNDRED  
SIXTY-SEVEN

---

S. P. 519 — L. D. 1339

**AN ACT to Provide a Feasibility Study for Express Highway Through Washington County.**

---

*Be it enacted by the People of the State of Maine, as follows:*

**Sec. 1. Feasibility study for express highway through Washington County.** The State Highway Commission shall be directed to study and report to the 104th Legislature on the feasibility of locating and building an express highway into and through Washington County linking Washington County with the present interstate highway system and Canada.

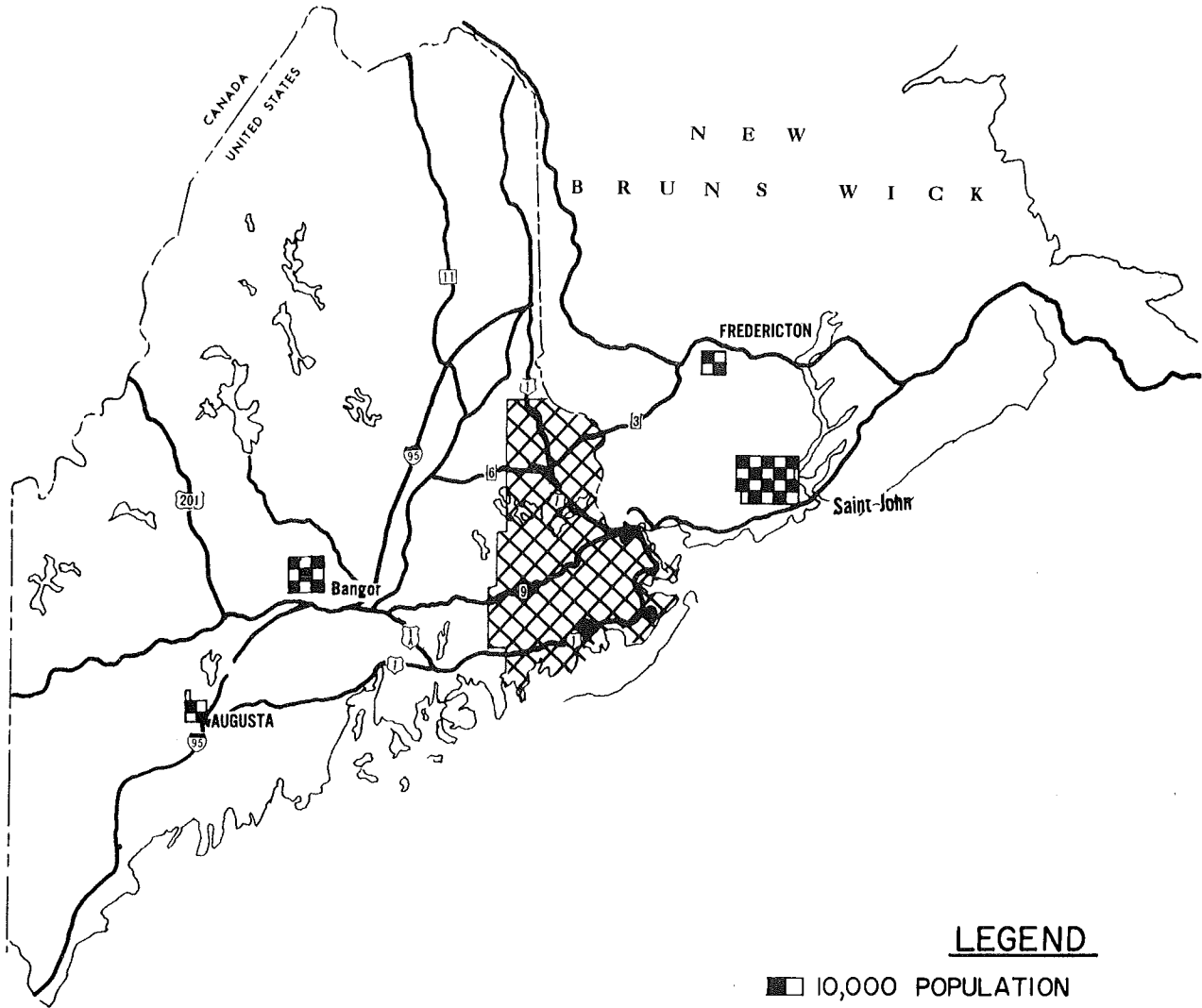
The feasibility study shall consider the present location of cities and towns, the location of inhabited areas, the location of seaports, the location of railheads, the location of industrial and recreational areas, the future growth, the geographical location and economic relationship of the county to Canada and to neighboring counties.

The Act basically instructs that a study of alternate routes at various locations in the County be undertaken. The present major highways through Washington County into Canada are Route 6 in the North, Route 9 toward the center of the County and Route 1 along the coast. These, therefore, form the logical corridors for a feasibility study.

The Act further directed that the study consider economic and demographic factors. In light of this specification, it is essential to note that about 85 percent of Washington County's population and industrial development is found south of Route 9. All of the seaports are in this area; most of the rail movement takes place here; and considering seasonal residents, the South is more populous. In order to be consistent with the legislation, this is the area on which to concentrate when considering major highway improvements -- especially since such improvements are expected to stimulate and reinforce the existing economy of the County.

In addition, the major Canadian population centers, adjacent to Washington County, fall on the Southern axis. St. John, as can be seen in the following figure, is about 86 miles from Calais on the Canadian coast, and is New Brunswick's largest population center with almost 100,000 people. Fredericton to the north (the provincial capitol) has only 20,000 people. Connections improving accessibility on the

# GENERAL STUDY AREA



## LEGEND

- 10,000 POPULATION
- WASHINGTON CO. COMMUNITIES WITH POPULATION OF 2,000 OR MORE

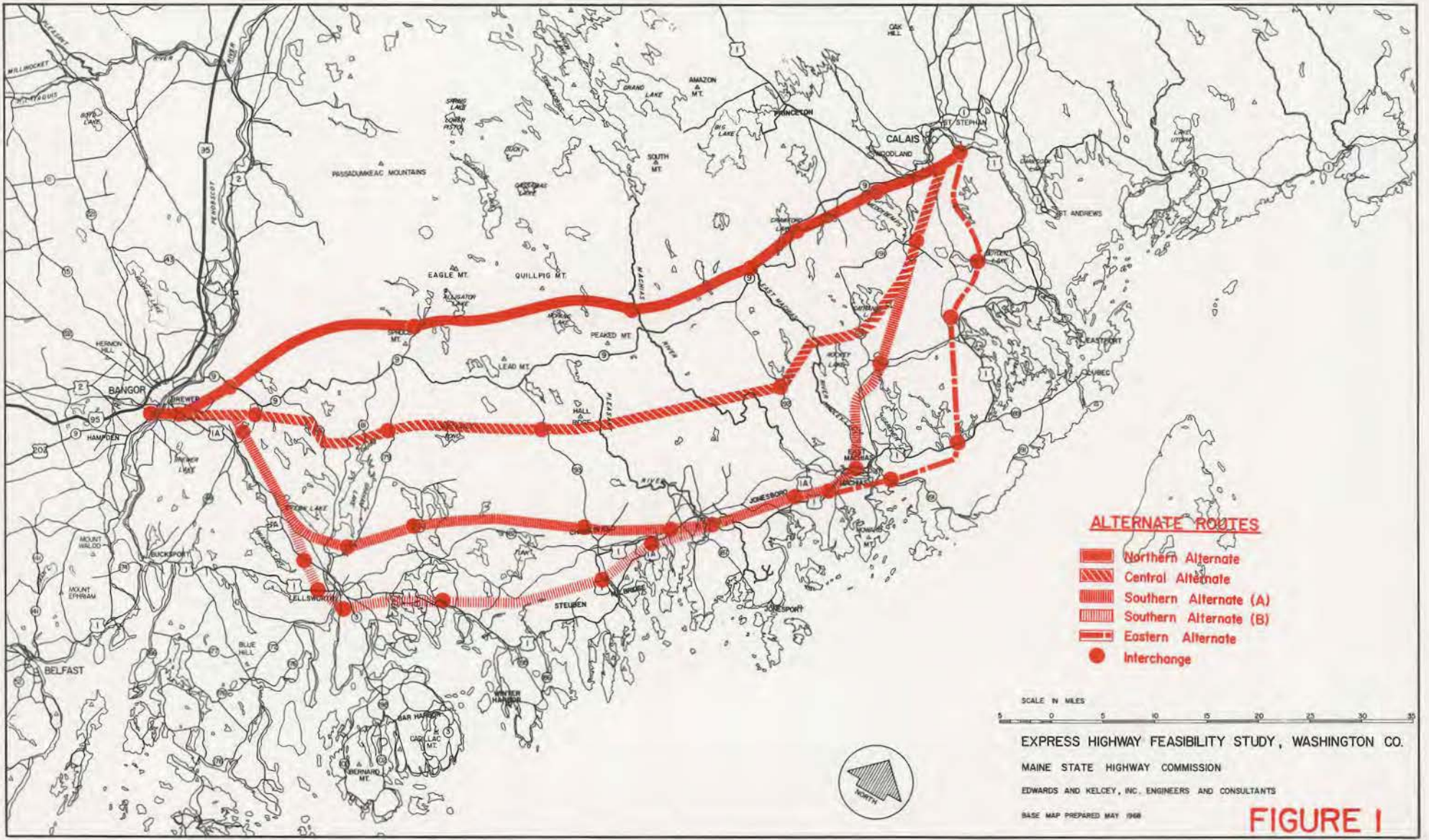


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Southern axis would therefore link Washington County with well developed areas in both Canada and Maine, as opposed to a more Northern facility which would not.

For these reasons, three alternate routes extending from Route 9 to the coast were considered to be within the scope of work intended by the legislation. These are illustrated in the following figure. The Northern alternate follows Route 9; the Southern alternate is basically a coastal one and the Central alternate is essentially halfway between the Northern and Southern routes.

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**ALTERNATE ROUTES**

- Northern Alternate
- Central Alternate
- Southern Alternate (A)
- Southern Alternate (B)
- Eastern Alternate
- Interchange

SCALE IN MILES  
 0 5 10 15 20 25 30 35

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BASE MAP PREPARED MAY 1948

**FIGURE 1**

## SUMMARY OF CONCLUSIONS

The findings summarized below and detailed in the remainder of this report indicate:

- 1) that an express highway through Washington County, at this time, would be premature
- 2) that portions of Route 1 should be built to express highway standards, since this appears to be the best alternate route into and through Washington County, at the present time
- 3) that general improvement of both Routes 1 and 9 should continue
- 4) a long-range plan for constructing by-passes around the urban and congested areas in the Route 1 area should be prepared
- 5) that these by-passes should be designed for future incorporation into a through route.

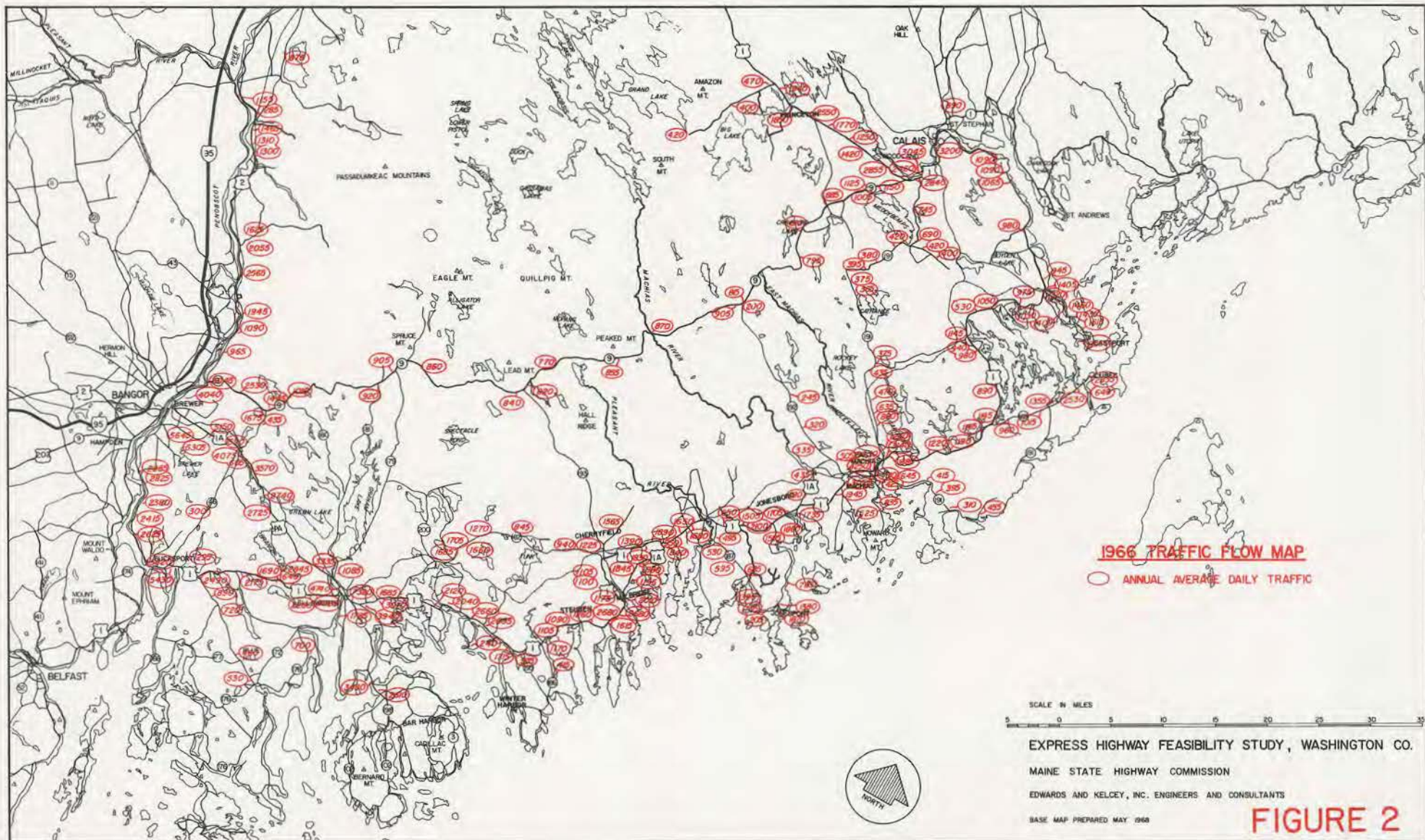
## 2. - TRAFFIC VOLUMES ON EXISTING ROUTES

Traffic data was provided for the Study by the Maine State Highway Commission. These data consist of the Statewide Traffic Flow Maps, the 1966 Origin and Destination Survey along the Route 1 Corridor, and the Ellsworth Traffic and Highway Planning Study. The portion of the 1966 Flow Map pertinent to this Study is shown in Figure 2. Because the O-D survey data were gathered in 1966, this is used as the base year for the analysis. Traffic flow data were available through 1967, and are used in determining the overall trend shown in Figure 3.

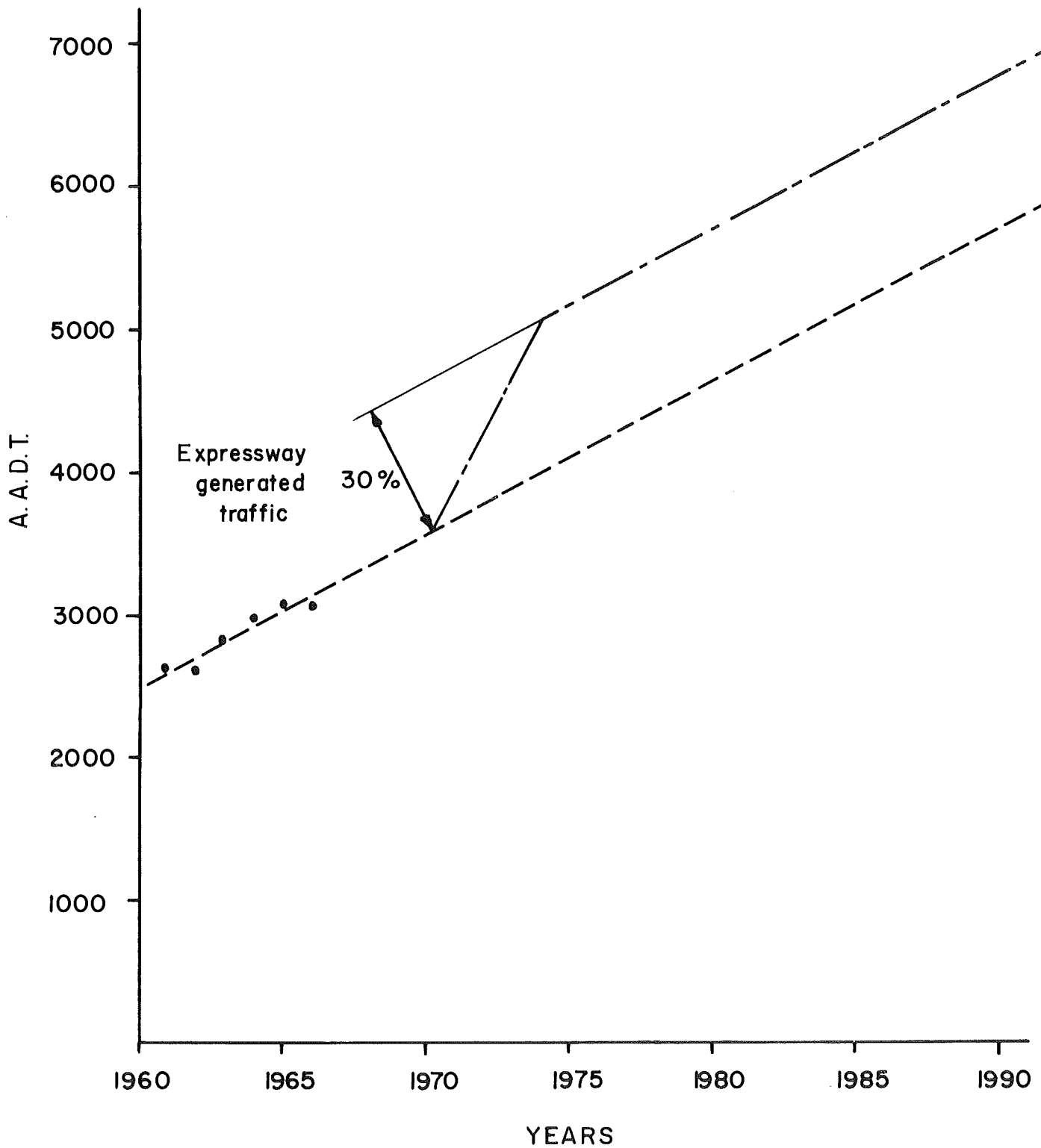
Seasonal traffic volume fluctuations are derived from data gathered with automatic traffic recorders operated year-round at various key locations throughout the State; the location which provides data most representative of traffic in the Study Area is located on Route 1 on the easterly side of Ellsworth.

A plot of the monthly average daily traffic volumes at this location in 1966 is shown in Figure 4. This plot shows the traffic to be highly seasonal, as is well known. The peak average monthly day is 2.3 times the low average monthly day and 1.6 times the average annual day. Additional analysis of the data from this traffic recorder location shows that trucks constituted 14 percent of the vehicles and that the 30th highest hour traffic volume, the volume used for design of rural highways, was 13.8%



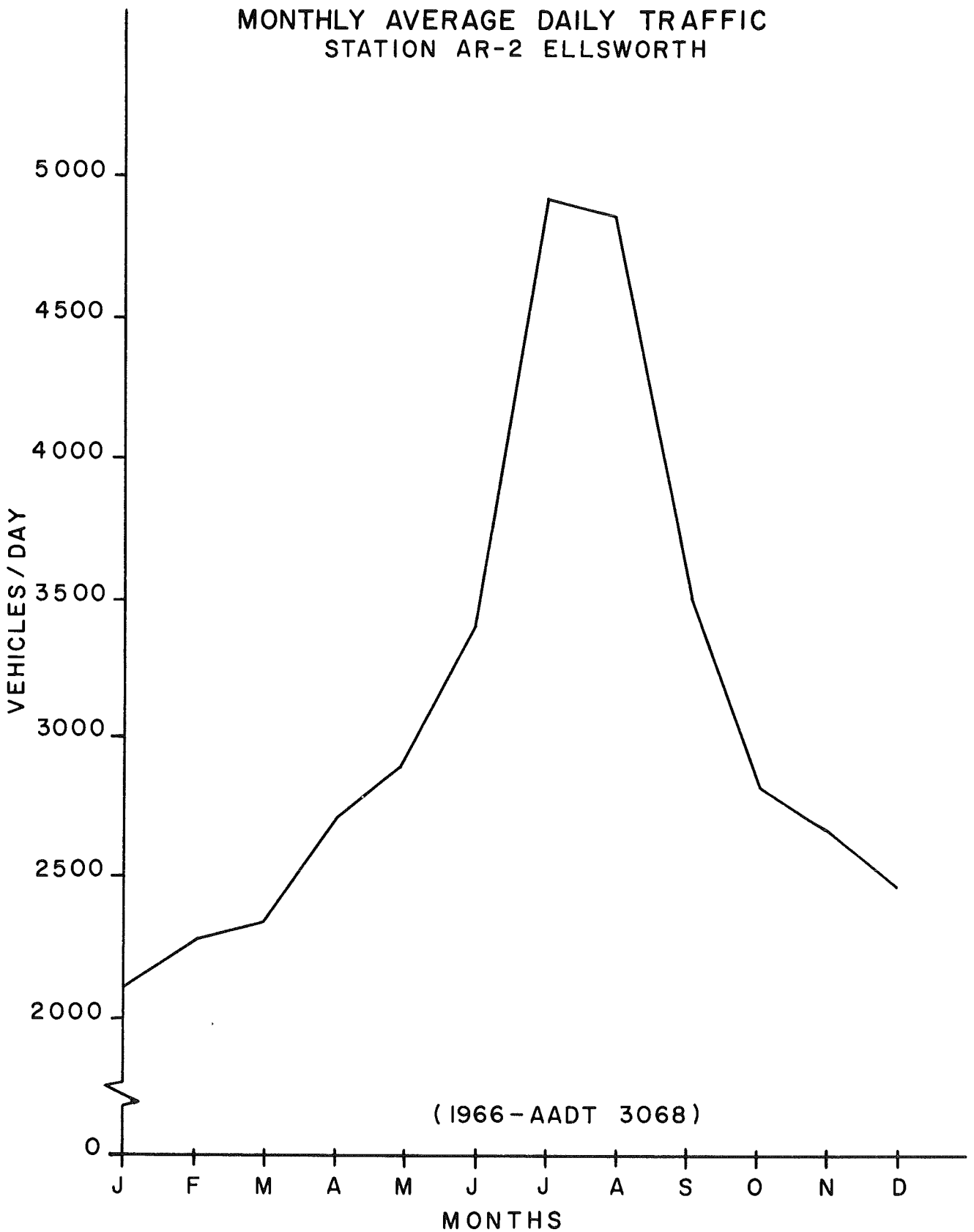


TRAFFIC PROJECTION  
STATION AR-2 ELLSWORTH



SOURCE: EDWARDS AND KELCEY PROJECTION BASED UPON EXISTING TREND

FIGURE 4



SOURCE: STATE HIGHWAY COMMISSION DATA

of the annual average daily traffic volume (AADT) consistently over the last three years of the data.

The Origin and Destination Survey provides information for most of the long-distance trips (20 - 25 miles and above) in the corridor. Short-trip volumes can be roughly approximated by comparing the long-trip volumes from the O-D Survey with the total traffic volumes shown on the Traffic Flow Map, Figure 2. The long trips in the O-D Survey contain only 4% trucks.

While this Study is primarily concerned with long trips, the short-trip volumes are important as they affect the total volume and speed of travel on segments of the existing road system. Express highways, in general, serve these short local trips indirectly by removing the through trips from the local roads. The main effort in this Study is to determine the number of through trips assignable to various alternate expressway routes and the resultant direct savings to expressway users. There are also savings to local traffic due to reduced congestion on the local roads, but these could not be computed from the available data.

Analysis of the data reveals that there are about twice as many long trips on any particular segment of Route 1 as on Route 9. Route 1 and Route 9 each carried about 750 vehicles per day the full length of the corridor in 1966. Route 1 carried long-distance traffic between intermediate

points in amounts varying from a few hundred a day east of Machias to 2,000 or more between Brewer and Ellsworth. Except in the immediate vicinity of Brewer and Calais, Route 9 carries very little other traffic.

On the basis of traffic volumes alone, an express highway through Washington County cannot be justified. The other sections of this report examine other justifications for such a highway.

### 3. - RECONNAISSANCE REPORT OF ROAD CHARACTERISTICS

A reconnaissance study of the major roads noting the general characteristics and recording travel times was made in 1968. The present travel times along the through routes from Bangor, Ellsworth, Machias and Calais are shown by the equal time lines in Figures 5 to 8. Capacity and speed restriction were recorded and the general level of local community traffic problems was observed. The accident data of the Highway Commission were reviewed.

The roads in the corridor are typical of those throughout the State. They vary from narrow surface-treated gravel pavements of low grade alinement to the highest modern standards of surface and alinement for two-lane roads. Except for town and city centers, quality is roughly proportional to traffic demand.

The statistic most representing the overall quality of the road is the normal operating speed. For Route 1 this was found to vary from 50 to 60 m. p. h. in the rural segments with 55 m. p. h. being the average, and with an overall average of 49 m. p. h. for the total length including travel through town centers. For Route 9 and the north-south interconnecting routes, average speed was 46 m. p. h. with very few segments exceeding 50 m. p. h. This average speed is typical of the normal operating speed for most of Route 9. These speeds were determined under low volume,





**TRAVEL TIME MAP**  
 ★ ORIGIN - BANGOR  
 — TEN MINUTES TRAVEL TIME



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 BASE MAP PREPARED MAY 1968

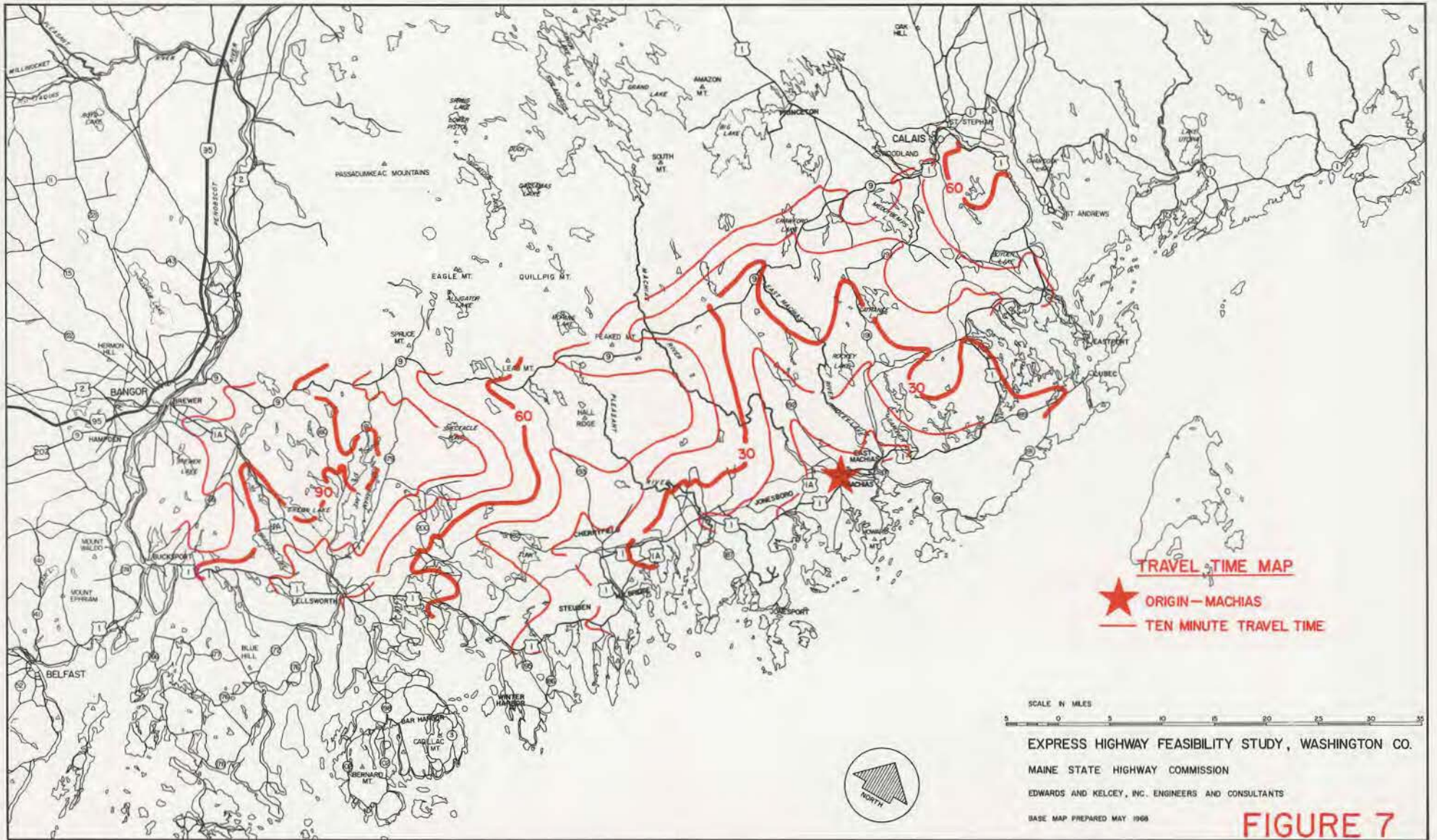
**FIGURE 5**













**TRAVEL TIME MAP**

-  **ORIGIN—MACHIAS**
-  **TEN MINUTE TRAVEL TIME**

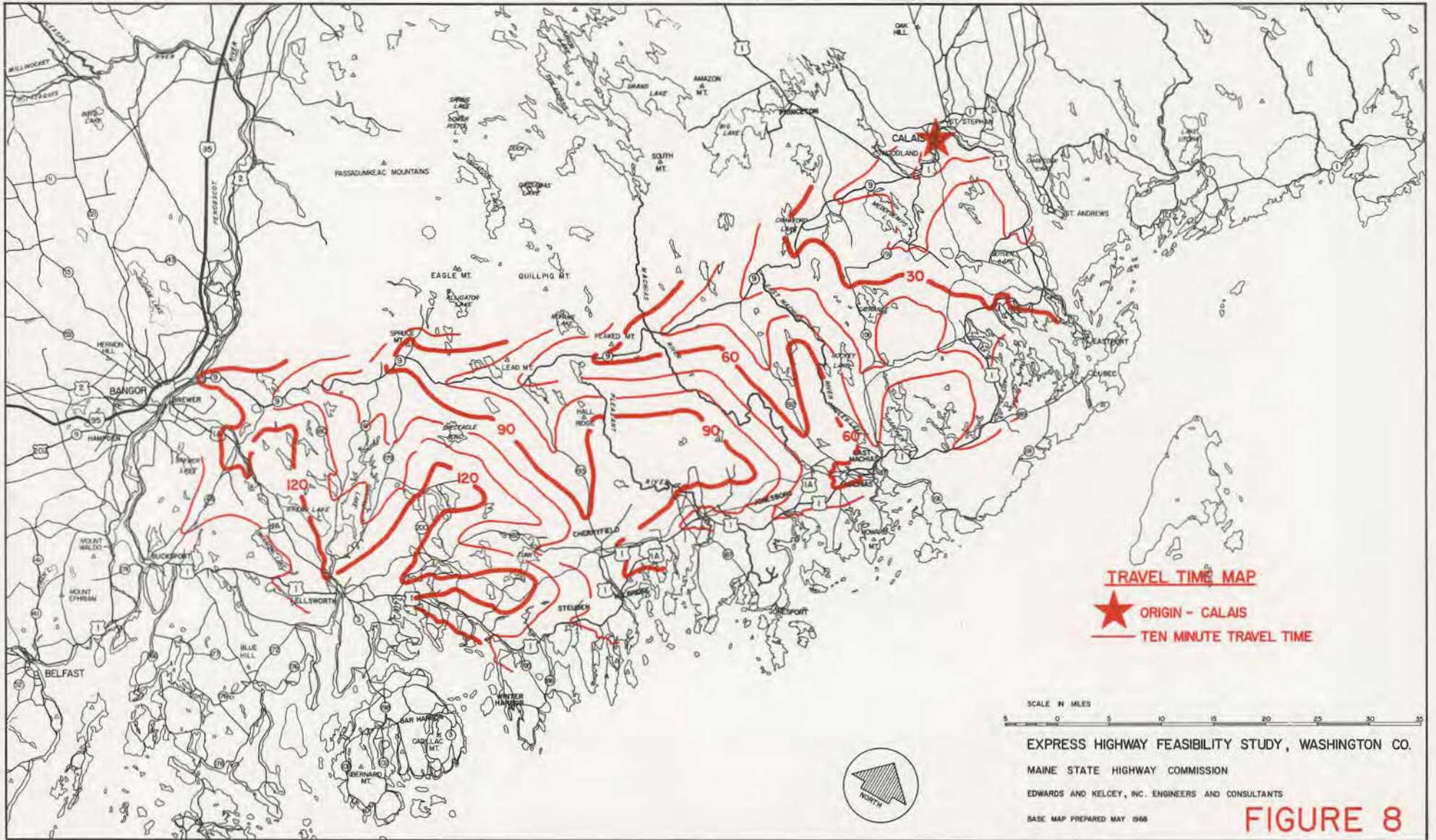


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 BASE MAP PREPARED MAY 1968

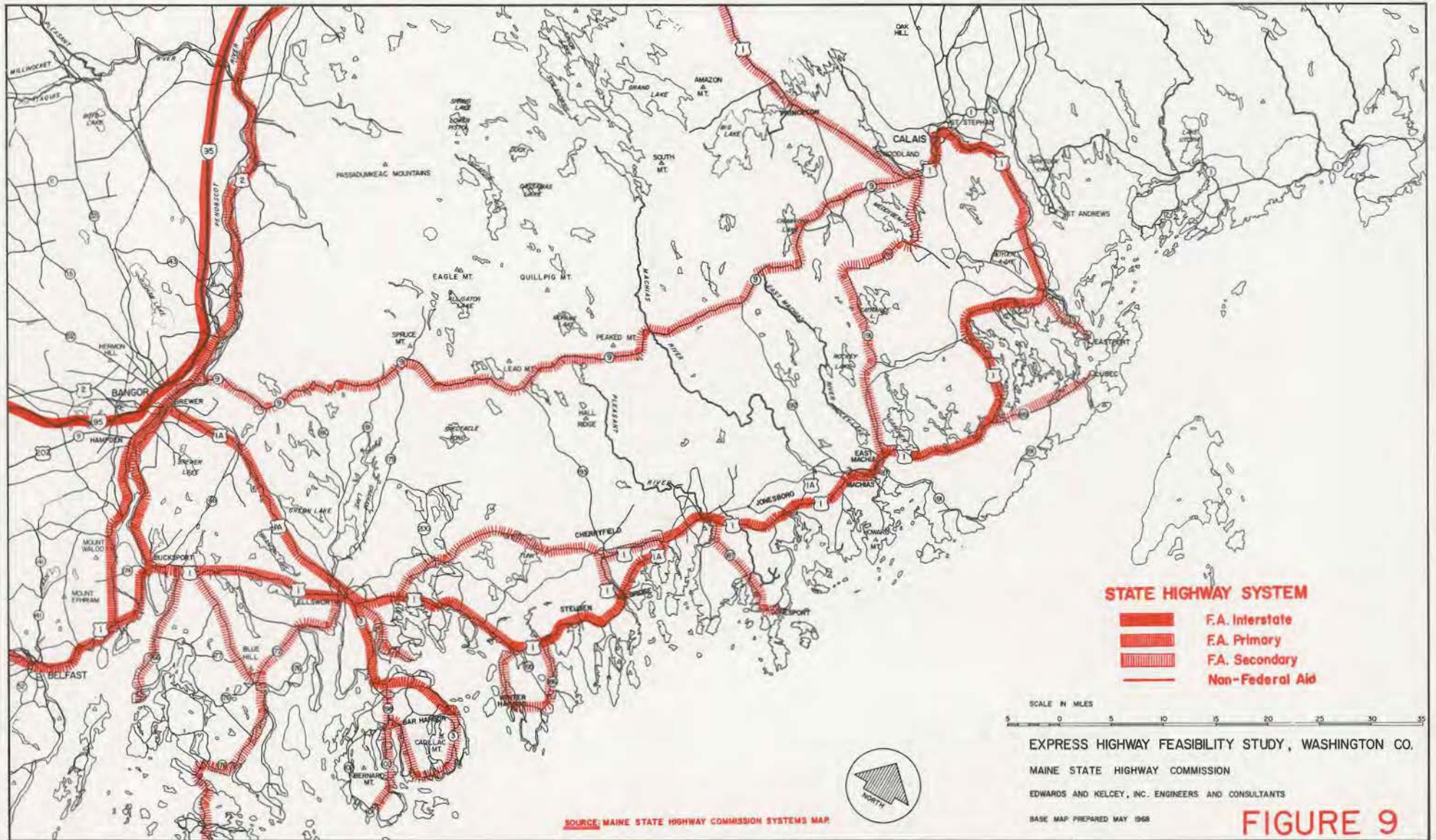


**FIGURE 7**









free-flowing conditions and would be reduced as traffic volumes increase. However, the present traffic volumes on the rural segments are seldom high enough to have any appreciable affect on speed. The excess available capacity is of the order of 2, 3 and 4 times present volumes.

Route 9, because of its shorter distance and lack of urban development, provides a shorter trip than Route 1 from either Bucksport or Bangor to Calais: the times are 126 minutes (about 43 minutes shorter) from Bangor, and 135 minutes (26 minutes shorter) from Bucksport.

Review of the accident data furnished by the Commission reveals that both Routes 1 and 9 are about average in accident occurrence. Therefore, neither can be said to be either better or worse from a safety point of view.

Considering traffic volumes and road characteristics, the essential problem in the corridor lies in the town centers. Each community is oriented about the main road connecting it to adjacent communities and this road carries an increasing, although still quite low, volume of through traffic intent on maintaining a high average speed with drivers having a generally low familiarity with local traffic conditions. All of the larger communities have obsolete street systems which have limited capacity to accommodate any appreciable traffic growth. The main roads through these towns are already unsatisfactory for the traffic mix they must serve, i. e., parking, local, collector, arterial, and through inter-regional

traffic. Road user service businesses and other typical roadside development is strung out along the main approaches to the towns, further reducing the service capacity of the main roads.

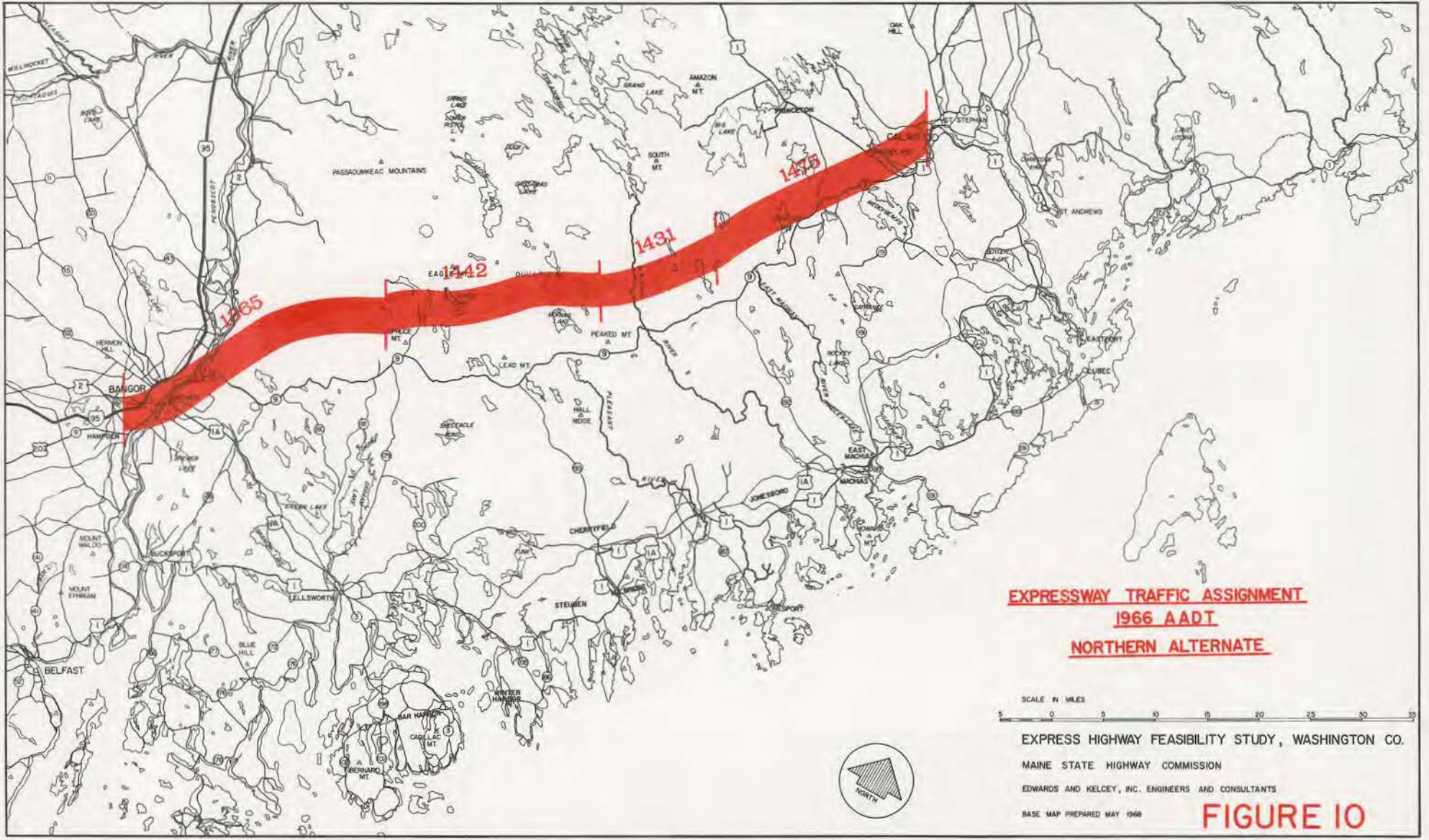
#### 4. - TRAFFIC ASSIGNMENTS TO THE PROPOSED EXPRESSWAY LOCATIONS

Three basic locations were postulated to determine the time savings, traffic volumes, and overall effect of an expressway in the corridor. These are shown in Figure 1 and are designated the northern, central and southern locations. The southern location has an alternate location for part of the distance. This is the Tunk Mountain Route which includes a short spur to Ellsworth. The northern and central routes could include a spur to Ellsworth from the northwest which would be considered on its own merit and is not included in this analysis.

Using the Bureau of Public Roads' Expressway Diversion Curve for allocating traffic to the best route according to travel time, all of the known long-distance trips were assigned to the alternate expressway systems. The 1966 Annual Average Daily Traffic volumes are shown by the flow bands for the alternate expressways in Figures 9 through 12.

1966 Design hourly volumes for this level of traffic are 210 for 1500 vehicles per day and 250 for 1800 vehicles per day. Normal design capacity for 2 lane rural roads is of the order of 700 to 800 vehicles per hour, and for a 4 lane divided expressway: 3600 vehicles per hour.





**EXPRESSWAY TRAFFIC ASSIGNMENT**  
**1966 AADT**  
**NORTHERN ALTERNATE**

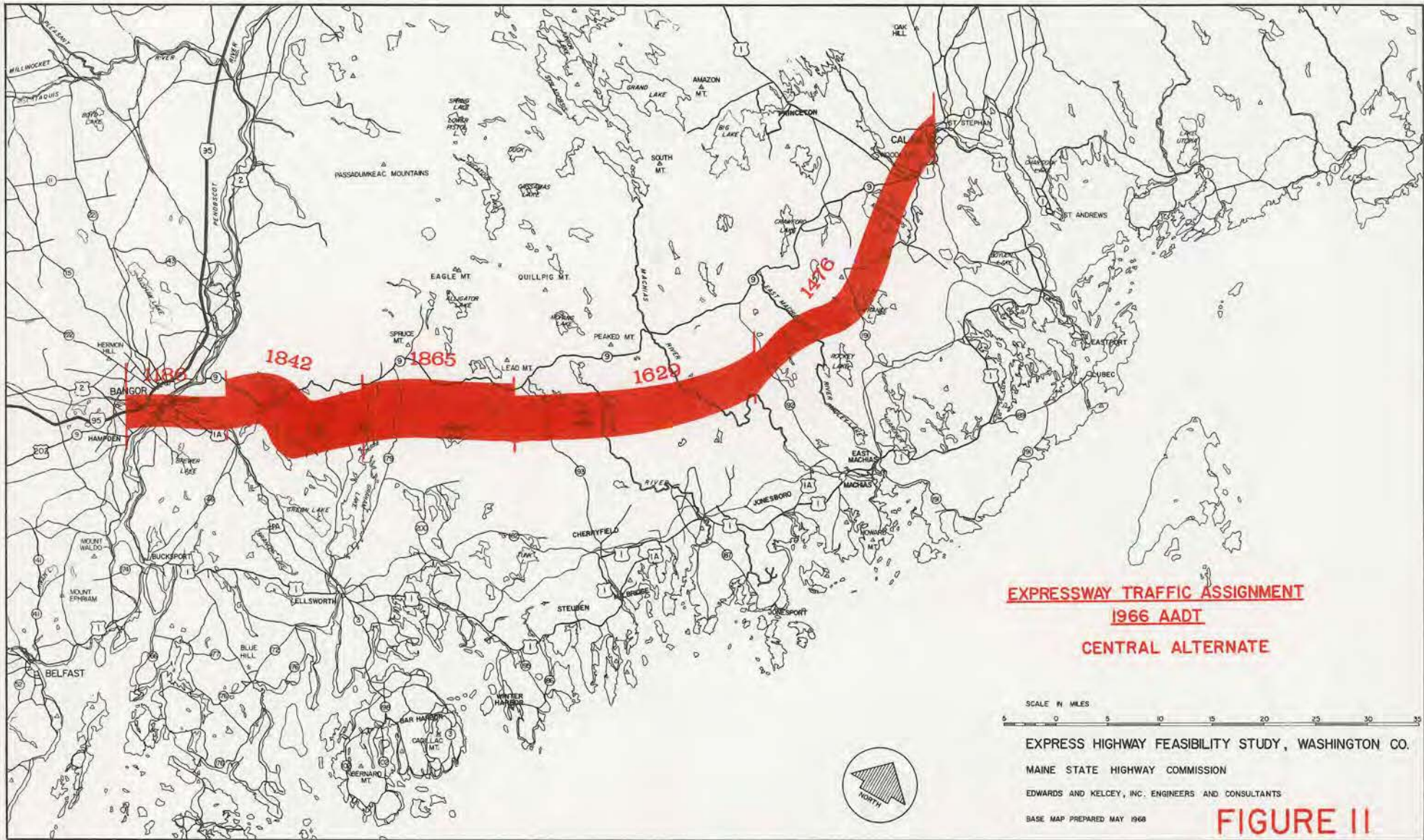


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**FIGURE 10**







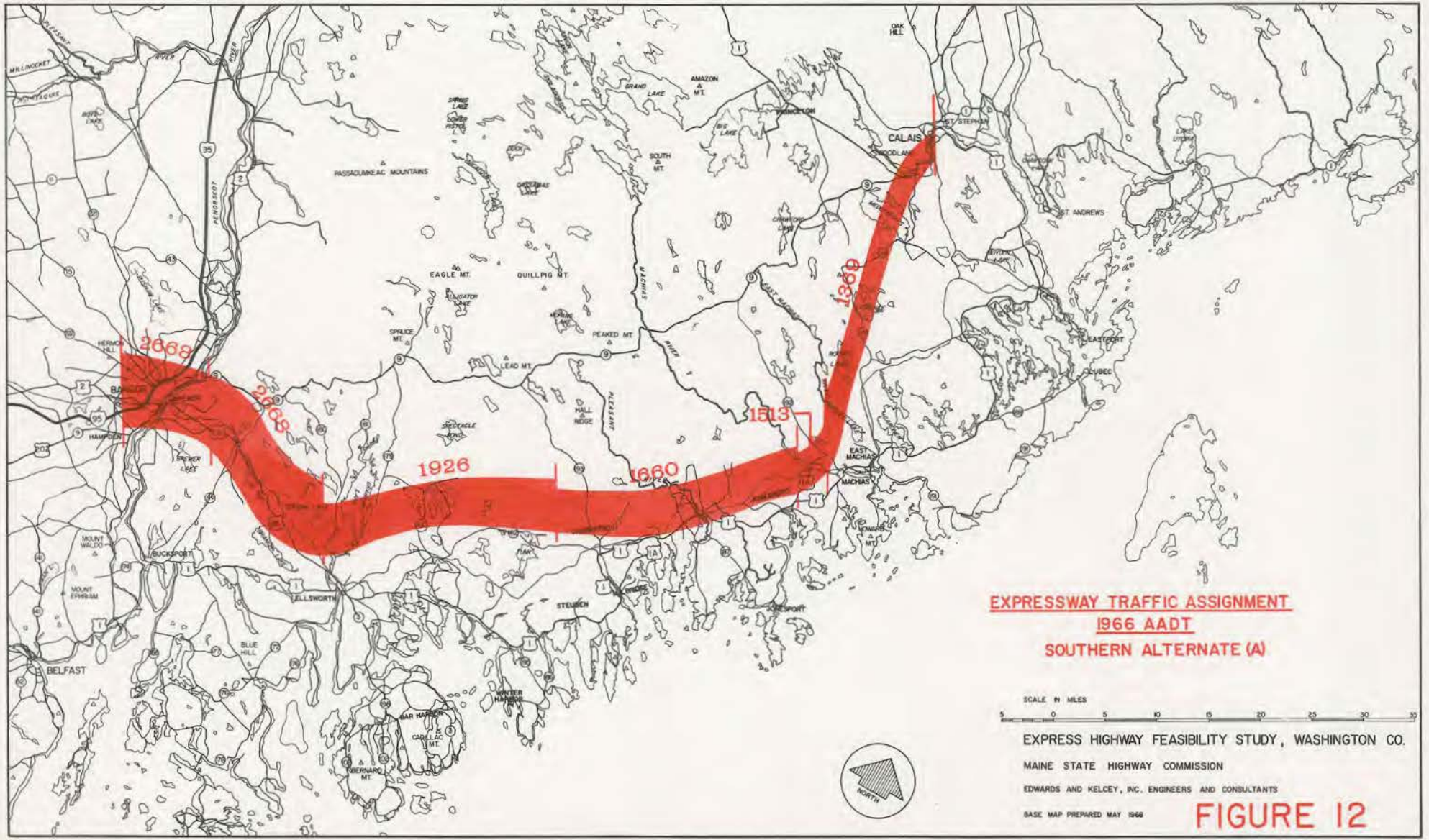
**EXPRESSWAY TRAFFIC ASSIGNMENT**  
**1966 AADT**  
**CENTRAL ALTERNATE**

SCALE IN MILES  
 0 5 10 15 20 25 30 35

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**FIGURE II**





**EXPRESSWAY TRAFFIC ASSIGNMENT**  
**1966 AADT**  
**SOUTHERN ALTERNATE (A)**



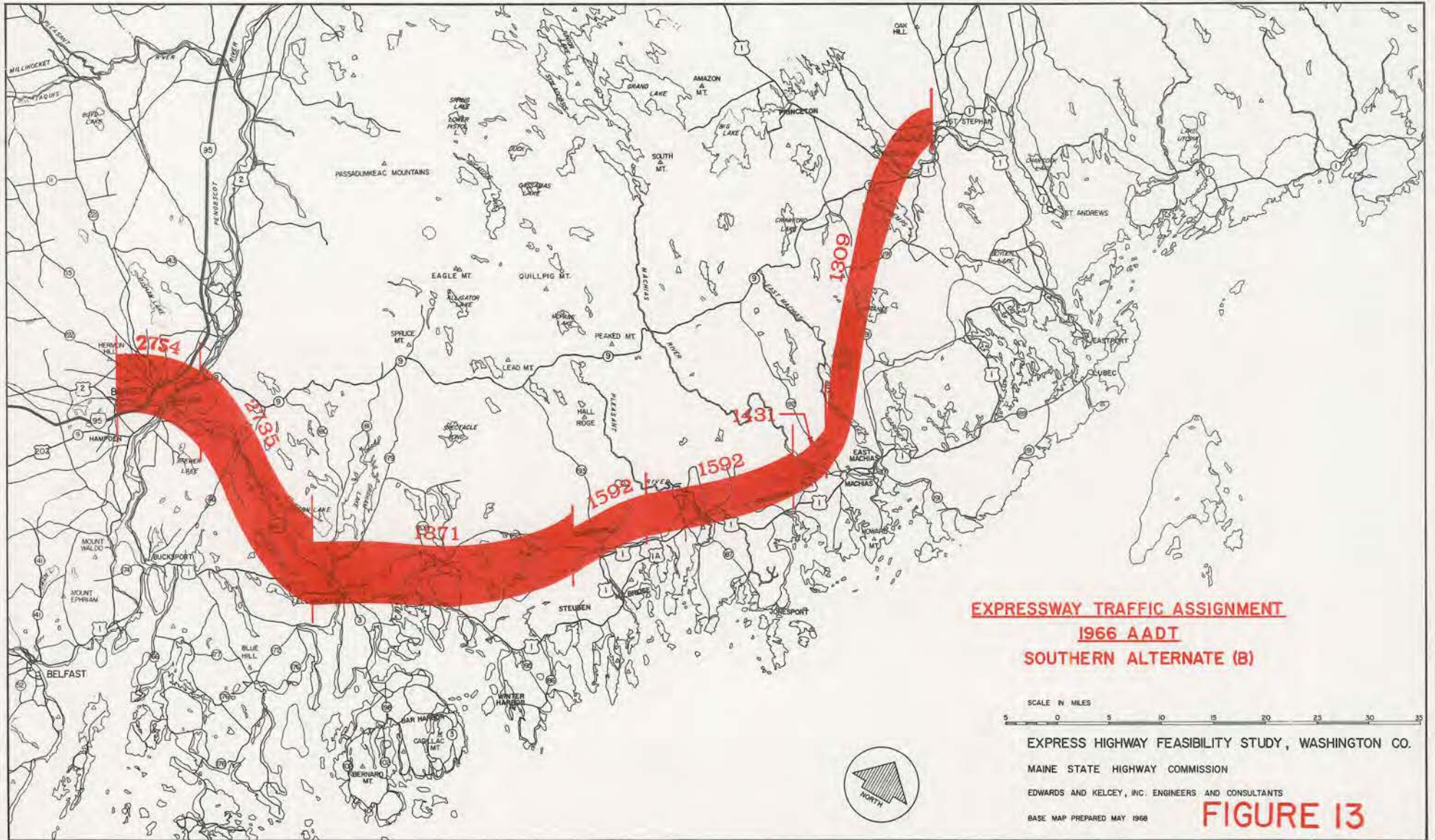
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BASE MAP PREPARED MAY 1966

**FIGURE 12**





## 5. - TRAVEL TIMES ON THE PROPOSED LOCATIONS

Travel times were computed for through trips in the corridor for all expressway alternate routings of known O-D pairs. Due to the light traffic volumes, the following conditions were assumed for 1966 traffic: free flowing traffic at 65 m. p. h. on the expressway alternates and normal operating traffic at 46 m. p. h. on the local roads. With increased traffic by 1990, normal operation was assumed for the expressways at 65 m. p. h. and local roads were assumed to have normal operation at 40 m. p. h.

Comparison of these travel times for present traffic shows the following:

1. Bangor - Calais: Northerly expressway time - 85 minutes - saving 41 minutes from present time, central route saves 34 minutes from present, southerly routes save 10 - 17 minutes from minimum time and 53 - 60 minutes from present Route 1.
2. Bangor - Machias: Present minimum time, 104 minutes via Route 1. Northerly expressway saves 10 minutes, central or southerly routes save from 25 to 32 minutes.
3. Ellsworth - Machias: Southerly route saves 20 minutes from the existing 71 minutes. The other routes offer no time savings.

4. Bucksport - Calais: The expressways offer between 25 to 29 minutes savings from the present shortest time of 135 minutes via Route 9.
5. Bucksport - Machias: Only the southern routes offer an appreciable saving of time, 25 - 26 minutes.
6. Machias - Calais: Northern route would save 6 minutes; central route, 20 minutes; and southerly, 28 minutes from present 65-minute travel time.

The above travel time analysis indicates that the northern route offers the most advantage to through trips, but none to intermediate trips; the middle route offers the intermediate advantage to most trips; and the southern route provides the most advantage to the intra-regional trips and only a slight improvement for Bangor-Calais trips compared to the shortest travel time. It does save nearly an hour over existing Route 1 for through trips wishing to follow the Route 1 corridor.

## 6. - USER COSTS

Since operating costs differ between expressway and local road operation, the annual user costs were computed separately for each of the four expressway alternates. Values of composite vehicle user costs, including time costs, of \$.11 per vehicle mile on the Local Roads and \$.09 per vehicle mile on the Expressway were used in accordance with existing State practice for similar studies. These costs were applied to the total annual vehicle miles of travel for long distance traffic for the alternate expressway systems. Based on the traffic projection from Figure 3, the user costs for each scheme were also computed for 1990 AADT according to the techniques published in the American Association of State Highway Officials Report, "Road User Benefit Analysis for Highway Improvements, 1960". The equivalent uniform annual costs and savings were then computed based on a constant annual increase in user costs from 1966 to 1990, and an interest rate of 5%.<sup>1</sup> The results are shown in the following table:

1. This is derived by computing user costs in 1966 and 1990 and assuming a straight line growth from 1966 to 1990.

TABLE 6-1

Scheme	Equivalent Uniform Annual Cost	Annual Savings
Existing System	\$22,800,000	-----
Northern Alt.	19,100,000	\$3,700,000
Central Alt.	18,800,000	4,000,000
Southern Alt. "A"	19,400,000	3,400,000
Southern Alt. "B"	19,900,000	2,900,000

Estimated Construction Costs of Expressways

Northern Route	\$116,099,663
Central Route	125,609,079
Southern Route (Alt. B) <sup>1</sup> .	173,365,568
Southern Route, Tunk Mtn. <sup>1</sup> . (Alt. A)	174,063,822
Improvements to Route 9	26,614,200
Improvements to Route 1	36,280,150

Savings of \$3,000,000 would amortize only \$46,000,000 in capital costs, and \$4,000,000 - only \$61,000,000.<sup>2</sup>.

1. Easterly alternate from Machias to Calais costs approximately \$9,500,000 more.
2. Annual capital costs are based on 5% interest rate and 30 year life.

Two user cost factors are missing in this analysis. The first concerns short trips that might use an express highway. These numbers could not be computed from the O-D survey data. The second concerns savings to local traffic due to reduced congestion on the local roads.

Considering trips missing in the O-D Survey:

1. There are none that are assignable to the Northern Alternate.
2. There are very few that could be assigned to the Central Route.
3. There are a significant number of the missing shorter trips on both of the Southern Routes that are assignable to the express highways but these numbers are not of the order of magnitude that would produce the several million dollars in annual user savings required to balance the capital costs.

Considering savings to local traffic due to reduced congestion:

1. There will be greater savings for the Southern Alternates because they attract many more trips from the local roads in the congested areas than do either the Central or Northern Routes.

2. For the Southern Alternate these savings would be significant, but again not of the order of magnitude necessary to finance a 4 lane express highway at this time even when added to the other factors.

Considering the superior service to the local population and the very adequate service provided long distance trips by the Southern Alternates, either of these routes appears to be more desirable as an eventual express highway location than either the Central or Northern Routes.



## 7. - SOCIO-ECONOMIC FACTORS

Much of southern Washington County lies on the fringe of growing coastal and inland areas to the south and west. There are currently no express highways in the area under consideration. The question at hand is, where in the designated area improvements should be made in the highway system that will stimulate the maximum amount of economic growth. In such a decision there are, of course, many factors. There are also unknowns. While it is known that improved accessibility stimulates growth, all of the means by which this actually takes place are far from clear. Highways have their maximum effect in areas where production, either of goods or services, has positive prospects for growth. In other words, in an economically healthy area highways will have a more immediate and extensive effect. Improved highway connections can have positive effects on areas that are not growing, but for them to do so it is necessary to make a concerted effort to establish economic growth in the areas. A highway alone will not do this.

There are no extensive areas of Washington County that are experiencing population and economic expansion. In fact, large portions of the area are declining and equally large portions are uninhabited since their primary use is for timber. There is, however, a section of the Study Area centering around Machias and Calais that has

experienced growth. In contemplating highway improvements it may be possible to capitalize on this growth and encourage it to spread.

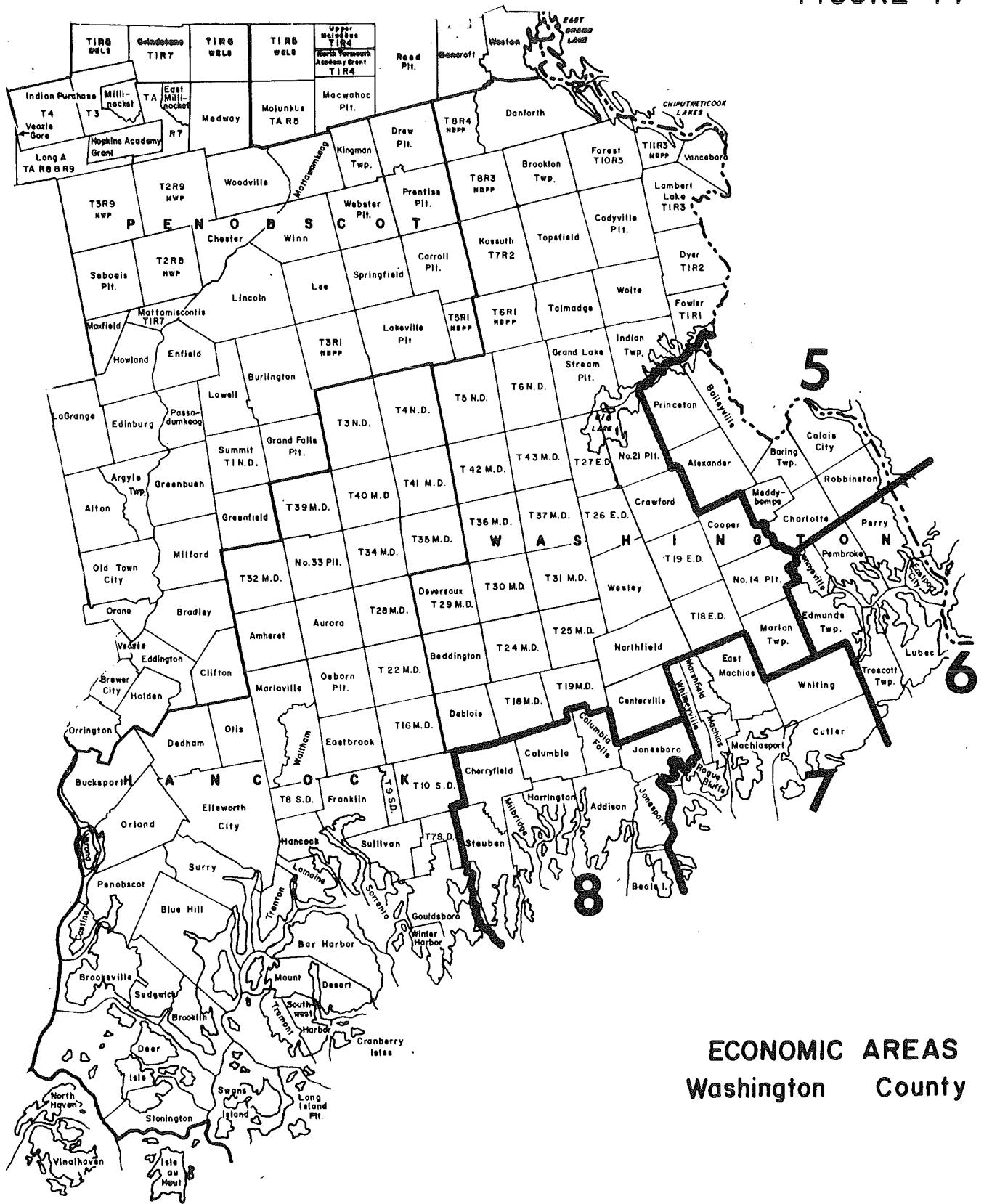
A. Effect of the New Highway Upon Population

The proportion of Washington County's population living in Study Area communities (Economic Areas 5 - 8, see Figure 14) has remained at about 83 percent for the past seven years. Therefore, trends for the County as a whole refer mainly to the present Study Area.

The most densely-settled areas are along the coast and center around Calais and Machias. While Calais experienced a population decline between 1950 and 1960 based on census data, recent estimates by the Maine Department of Health and Welfare for 1966 indicate that growth has been occurring. The City itself added about 8% to its 1960 population by 1966, and the economic area of which it is a part gained by 5 percent. The area surrounding Machias remained essentially stable in the 1960 - 1966 period, but experienced growth in the 1950's and recent potential developments in Machiasport indicate that growth can continue.

The remaining coastal areas center around Lubec - Eastport and Jonesport. Both of these areas have been losing population consistently over the 1950 to 1966 period. Recent losses in the Lubec - Eastport economic area have been serious (-16% between 1960 and

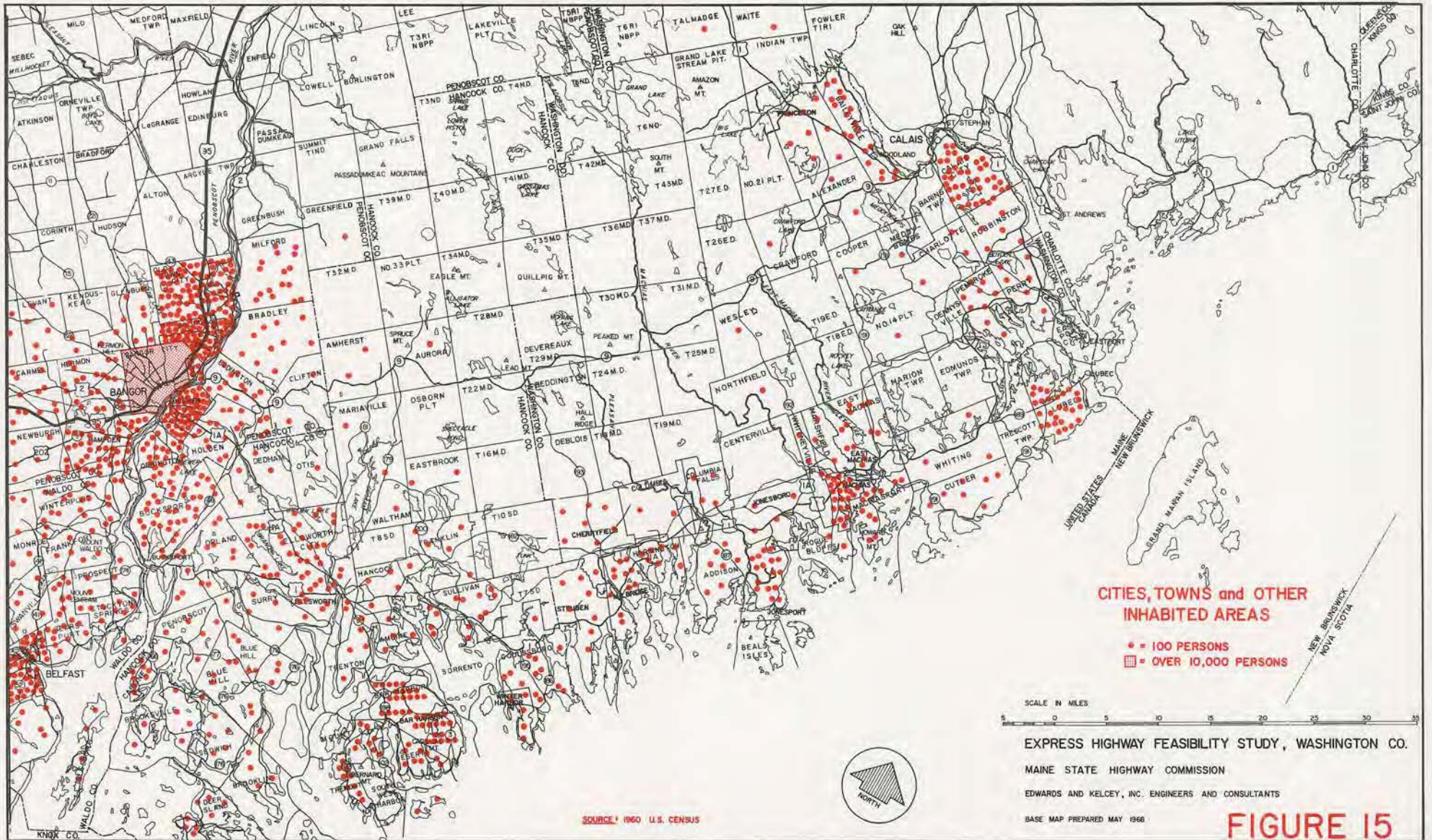
FIGURE 14



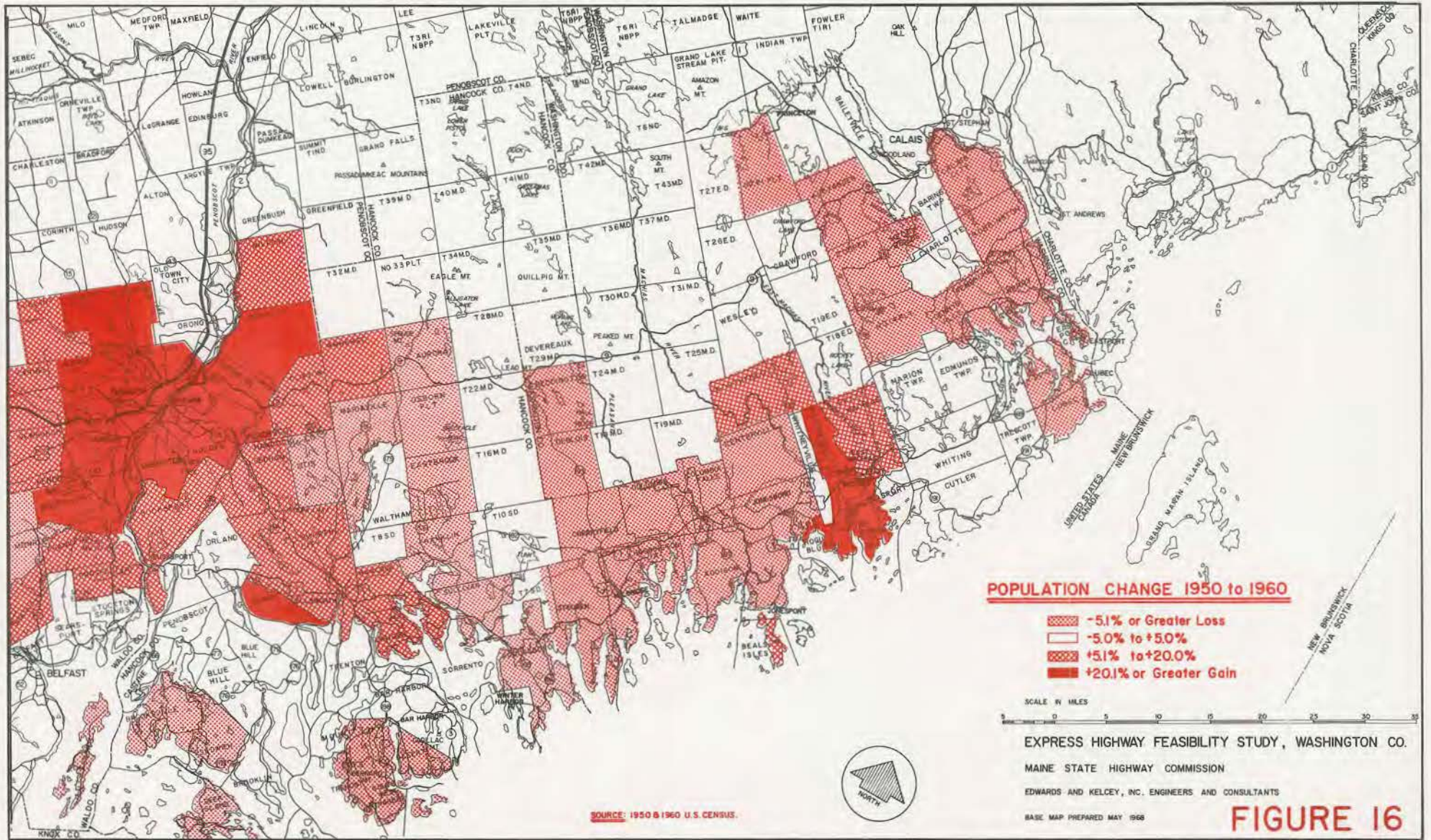
SOURCE: Maine Handbook—A Statistical Abstract

WASHINGTON COUNTY EXPRESS HIGHWAY FEASIBILITY STUDY  
Maine State Highway Commission - Edwards and Kelcey, Inc., Consultants

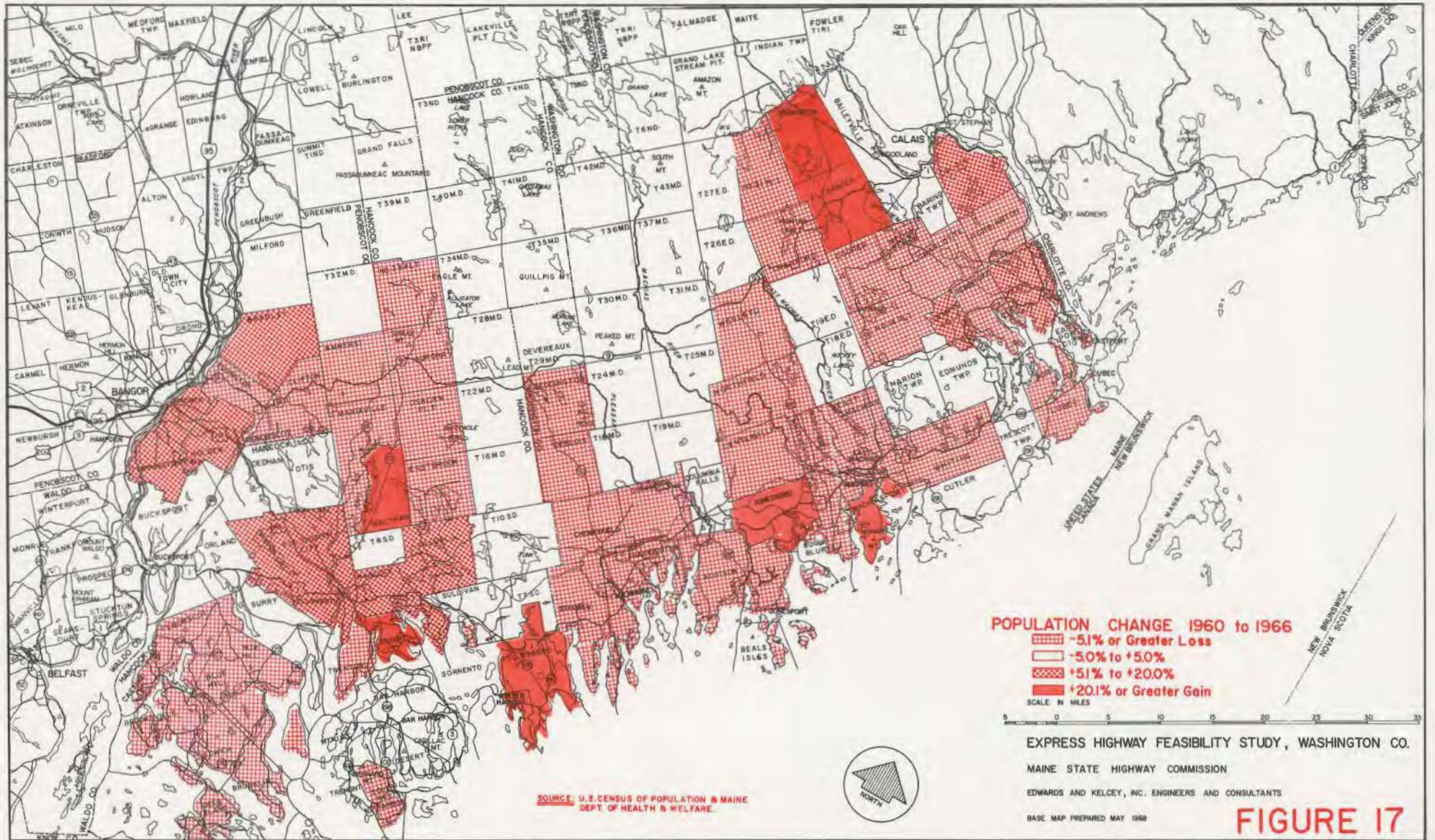












1966). Declines in the Jonesport area amounted to 7% between 1960 and 1966.

While the population of Washington County as a whole has experienced a long-term historic decline, recent trends indicate that the situation is changing in certain coastal areas. This growth has important economic implications which are discussed later in this section.

People left Washington County during the 1950's at much faster rates than they left Maine as a whole (see Table 7-1). Many Washington County residents settle in other parts of Maine - and these residents would naturally be attracted to the State's larger urban areas where jobs are more plentiful. It is interesting that children were more frequent out-migrants in Washington County than they were in the State. At the same time out-migrants in the 20 - 29 age bracket (young parental groups) were more than twice as frequent in Washington County as in Maine as a whole. This relationship implies that persons leaving Washington County in family units are more likely to relocate elsewhere in the State than they are to leave the State altogether. In turn, those who leave Maine are less likely to be families with children.

During the 1950's there was a considerable movement of persons in the retirement years, into the County and a slight return to the State. It appears, then, that out-migrants from Washington County return to



their earlier home, and that Washington County attracted retired persons from other areas during the 1950's. This trend is quite common throughout New England, and, in some areas, has a noticeable economic effect. Retired people with independent incomes can be a financial asset to the community. They do not require jobs and they spend money in the local economy. Since it appears that the coastal areas of Washington County have an appeal to the senior citizen element of the population, their location in the area should be further promoted. They can be as valuable as summer residents.

TABLE- 7-1

MIGRATION RATE COMPARISONS

MAINE vs. WASHINGTON COUNTY 1950 - 1960

Age	<u>Washington County</u> Rate per 100 1960 pop.	<u>Maine</u> Rate per 100 1960 pop.
Under 10	-34.9	- 3.6
10 - 19	-23.5	- 7.4
20 - 29	-62.6	-22.6
30 - 39	-12.4	- 8.2
40 - 49	- 8.5	- 5.8
50 - 59	- 5.1	- 3.9
60+	+28.0	+ 0.4

Source: U. S. Census of Population and Maine Department of Health and Welfare

# POPULATION TRENDS IN MAINE

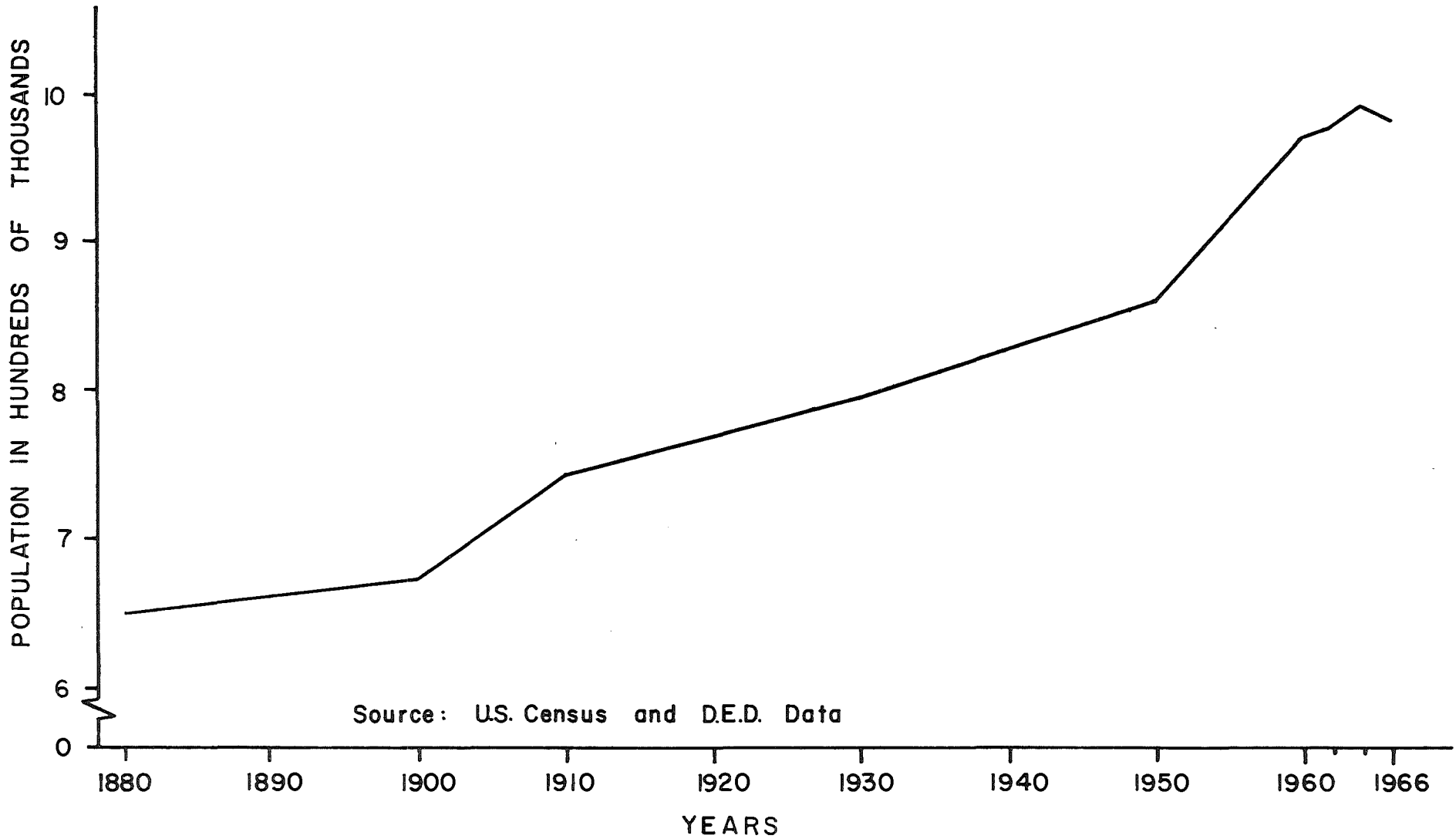


FIGURE 18

POPULATION TRENDS IN WASHINGTON COUNTY 1880 - 1966

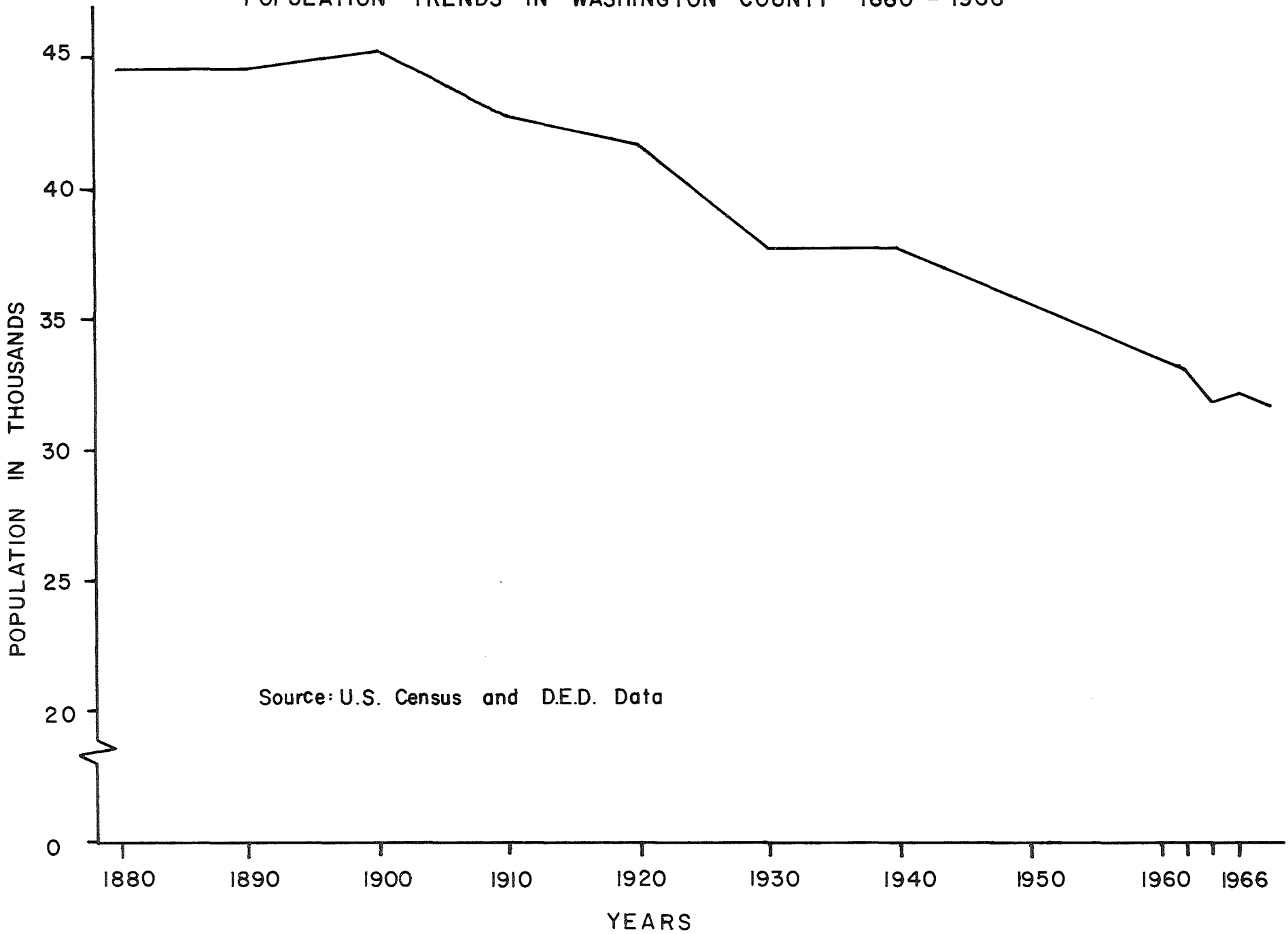


FIGURE 19

TABLE- 7-2

MIGRATION RATE COMPARISONSMAINE vs. WASHINGTON COUNTY 1960 - 1965

Age	<u>Washington County</u> Rate per 100 1960 pop.	<u>Maine</u> Rate per 100 1960 pop.
Under 10	- 3.9	- 7.1
10 - 19	- 4.0	- 5.2
20 - 29	-11.6	-15.1
30 - 39	- 4.3	- 3.4
40 - 49	- 2.1	- 3.3
50 - 59	0	- 1.4
60+	+ 3.5	+ 2.4

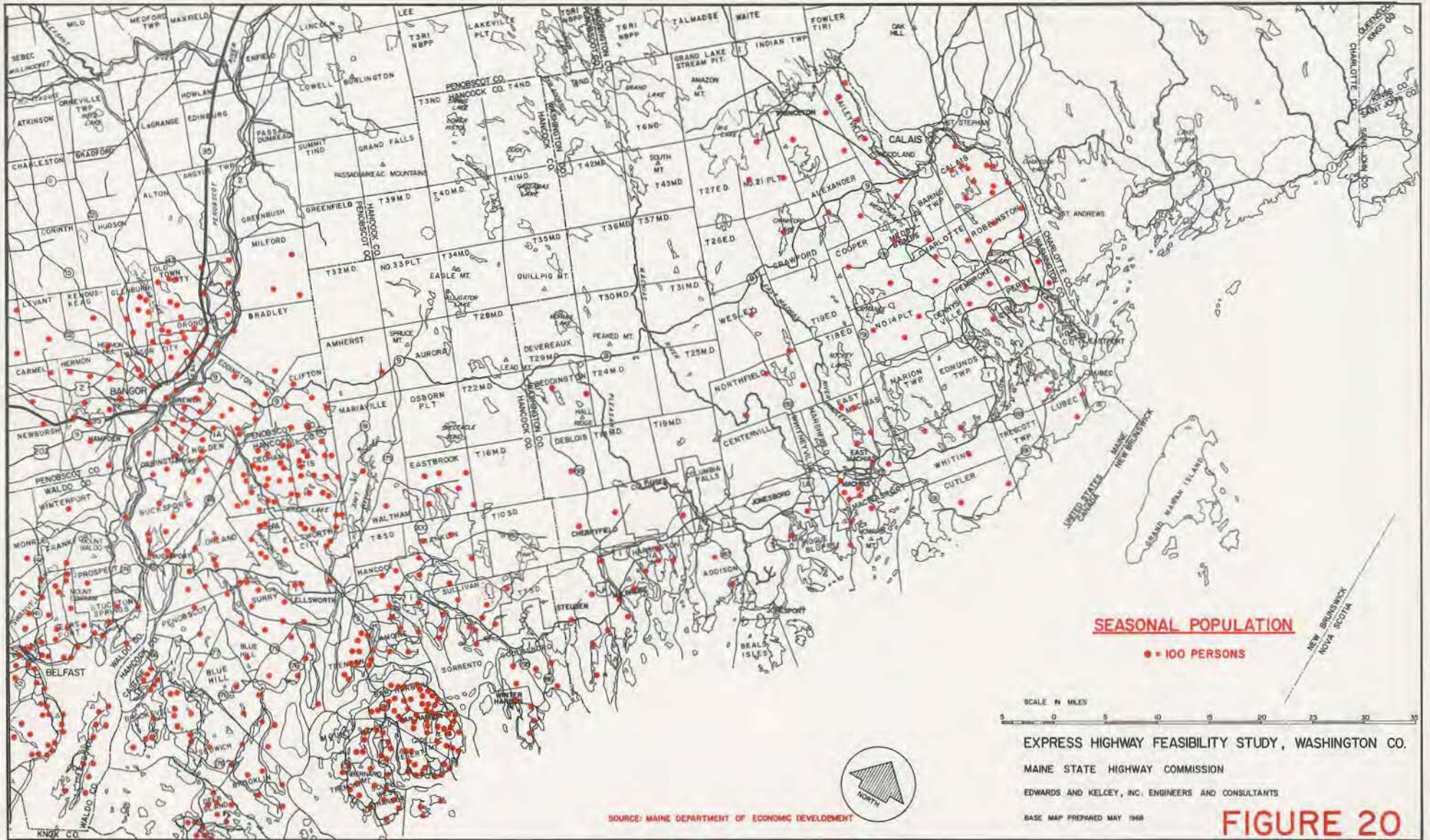
Source: U. S. Census of Population and Maine Department of Health and Welfare

Considering recent 1960 - 65 migration patterns in Washington County and the State as a whole (see Table 7-2), it appears that the type of migration that took place during the 1950's, among the groups under 30 years of age, is continuing into the 1960's although at a slower pace. However, the data indicate that a major shift is taking place among the older groups, over 60 years of age. During the 1950's the rate of movement into Washington County, of the population 60 and over, vastly exceeded that into Maine in general. It seems, then, that



Washington County has lost some of its appeal while other parts of Maine have gained. This is indicated by the fact that the rates of immigration into the County and the State did not differ significantly over the 1960 - 1965 period but they did between 1950 and 1960. This reversal could be due to several factors. First, it must be noted that the population figures for 1965 are estimates and could be inaccurate. If they are reasonably correct, however, several inferences can be drawn. One is that many of the young people who left Washington County are no longer returning at the end of their working life. Another is that the older population that did not migrate earlier are starting to. Many of this group may be leaving to join their children in other parts of the State. Nevertheless, Washington County still remains attractive to the retired population.

Patterns of migration are a by-product of economic conditions. In Washington County it is well known that economic conditions are depressed far below the national level and even below those in Maine in general. Obviously, the way to reverse the out-movement of the area's young people is to find jobs to employ them. Improved highway access will not in itself provide long-term employment. However, without it, many types of movement within and into the County are not likely to take place. These migration patterns simply point to the fact that a human resource is being exported from Washington County - and that if



jobs were available people could be recruited into Washington County's labor force.

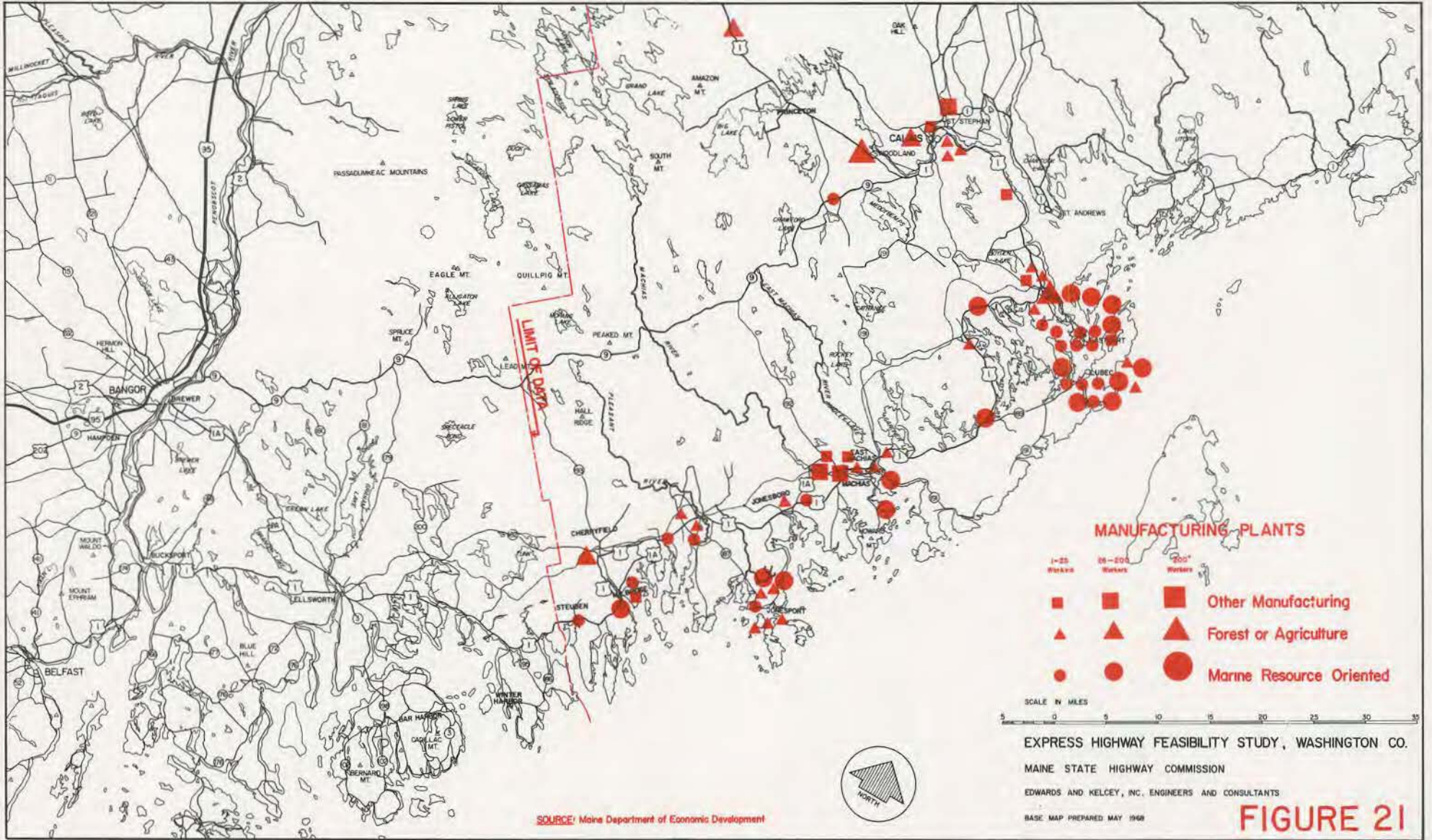
B. Effect of the New Highway Upon Industry

As with population, employment levels in Washington County, as a whole, have been declining. Unemployment levels have been and remain high while wages remain fairly low. There is considerable documentation for the fact that pervasive economic problems face the County. These will not be dealt with in detail here since the main consideration in the present analysis is the future effect an improved highway system might have on the economic life of the County, and where the effect could be the greatest.

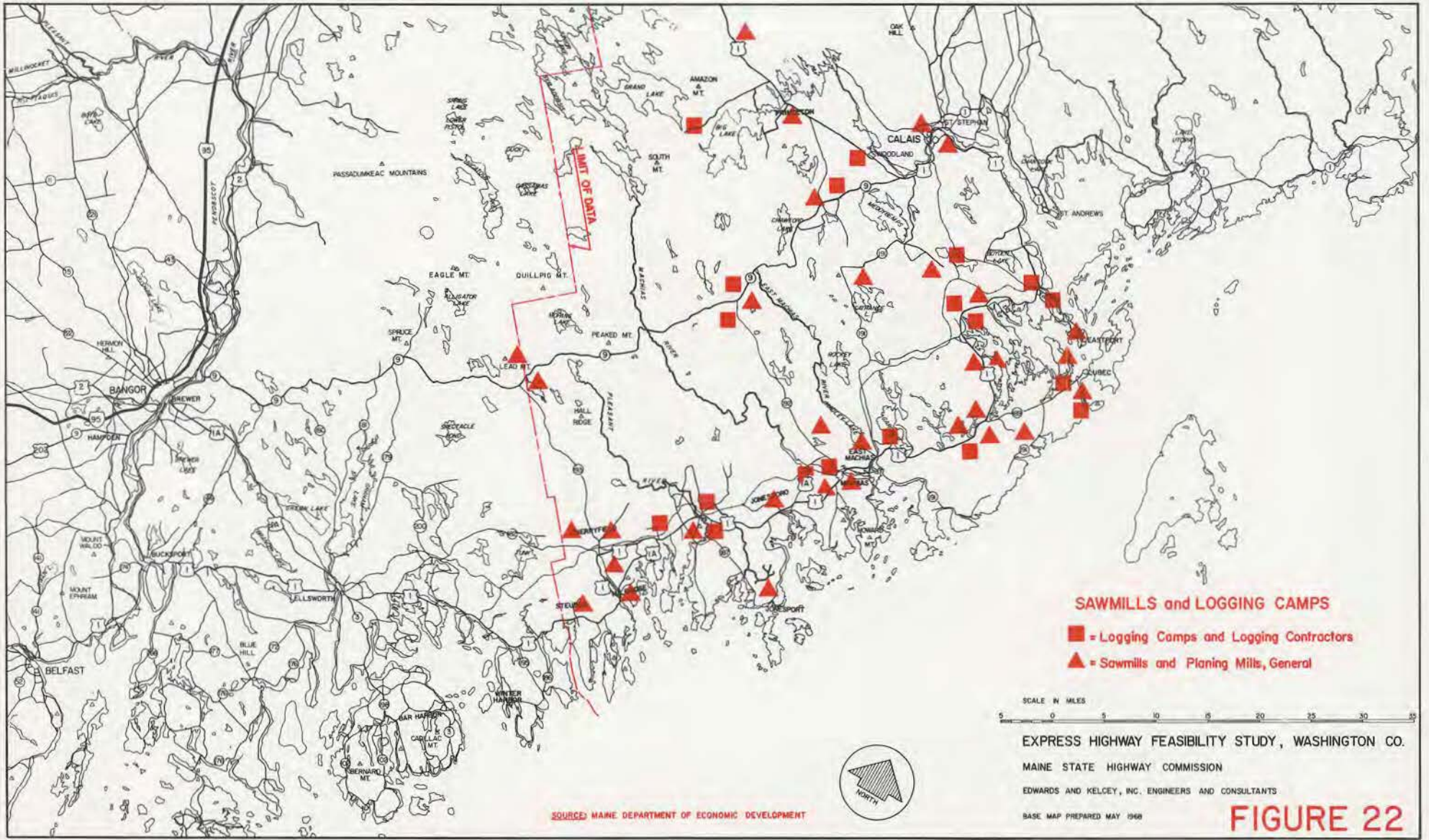
In terms of its employment structure, Washington County specializes in activities which are related to its main natural resources. Its trade and service function is minimal, indicating that these industries rely primarily on residents who satisfy their needs locally.

The recreation function of the area cannot be ignored, but at the present time year-round activity is far more important than seasonal activity. In 1966, there were approximately 7,200 seasonal residents in the Study Area, 23% of the permanent population. Coastal and inland areas to the south and west are more densely populated with seasonal residents but numbers will grow in the study area as southern regions become more crowded.









**SAWMILLS and LOGGING CAMPS**

- = Logging Camps and Logging Contractors
- ▲ = Sawmills and Planing Mills, General

SCALE IN MILES  
 5 0 5 10 15 20 25 30 35

EXPRESS HIGHWAY FEASIBILITY STUDY, WASHINGTON CO.

MAINE STATE HIGHWAY COMMISSION

EDWARDS AND KELCEY, INC. ENGINEERS AND CONSULTANTS

BASE MAP PREPARED MAY 1968

**FIGURE 22**

SOURCE: MAINE DEPARTMENT OF ECONOMIC DEVELOPMENT

As an economic asset, the seasonal resident's value can hardly be ignored. He places no great demands on community facilities, yet pays taxes to support them. Aside from his purchase or rental of real estate, he spends money in the local economy, as evidenced by the fact that, on a monthly basis tax revenues tend to be higher during the summer season. (Source: Table 5, "Washington County, Maine, Industrial Fact Book" prepared by the Maine State Department of Economic Development - Division of Research and Planning.)

Most seasonal residents reside near the Area's coastal or inland water resources. It seems apparent therefore that a highway facility, in the coastal area, would be of greatest benefit to the seasonal resident and would probably encourage further development because travel times and road conditions from major population centers would be improved. (Source for seasonal resident data - Maine State Department of Economic Development.)

Total employment in Washington County has been declining by an average of about 190 - 200 workers per year since 1960. The manufacturing sector has contributed more heavily to these declines than have non-manufacturing activities.

Employment in construction has fluctuated recently because of a major expansion program at the St. Croix Paper Company at Woodland.

Many construction workers were apparently brought into the County for this work. Therefore, losses in this area relate to more basic trends and do not reflect long-term patterns within Washington County itself. Losses in wholesale and retail trade are a function of declines in population as well as in other employment categories. Government employment is a major stabilizing influence. Employment levels for government workers do not fluctuate radically from year to year nor are they affected by seasonal requirements, as is agricultural and certain manufacturing employment.

Agricultural employment is declining as the industry becomes increasingly mechanized. This is part of a national trend and one that seems necessary if profit margins are to be maintained.

These broad trends in employment serve to substantiate the fact that Washington County continues to face serious economic problems.

TABLE- 7-3

EMPLOYMENT TRENDS IN WASHINGTON COUNTY

1962 - 1967 Annual Averages

	1962	1967	<u>Change</u> 1962 - 1967
<u>TOTAL EMPLOYMENT</u>	9,430	8,450	-980
<u>Manufacturing</u>	<u>3,050</u>	<u>2,830</u>	<u>-220</u>
<u>Non-Manufacturing</u>	<u>4,040</u>	<u>3,900</u>	<u>-140</u>
Forestry and Fishing	380	400	+ 20
Construction	380	220	-160
Transportation, Communi- cation, Utilities	350	320	- 30
Trade	1,060	920	-140
Finance, Insurance, Real Estate	100	90	- 10
Government	1,200	1,290	+ 90
Services**	570	660	+ 90
<u>Agricultural</u>	<u>570</u>	<u>400</u>	<u>-170</u>
<u>All Other Non-Agricultural</u>	<u>1,770</u>	<u>1,320</u>	<u>-450</u>

\*\* Includes Miscellaneous Non-Manufacturing.

SOURCE: Maine Employment Security Commission

TABLE- 7-4

EMPLOYMENT DISTRIBUTIONSWASHINGTON COUNTY AND MAINE, 1960

INDUSTRY	WASHINGTON COUNTY EMPLOYED		MAINE EMPLOYED	
	#	%	#	%
<u>Total Industry</u>	9, 544	100. 0	330, 589	100. 0
Manufacturing		31. 9		33. 2
Trade		15. 6		17. 7
Professional and Related Services		16. 6		22. 5
Construction		13. 0		6. 0
Transportation, Communica- tions, Utilities		5. 4		6. 2
Public Administration		5. 4		4. 8
Agriculture		4. 9		5. 3
Forestry and Fisheries		4. 5		. 9
Other		2. 7		3. 3

SOURCE: 1960 Census of Population.

NOTE: Columns may not total due to rounding.

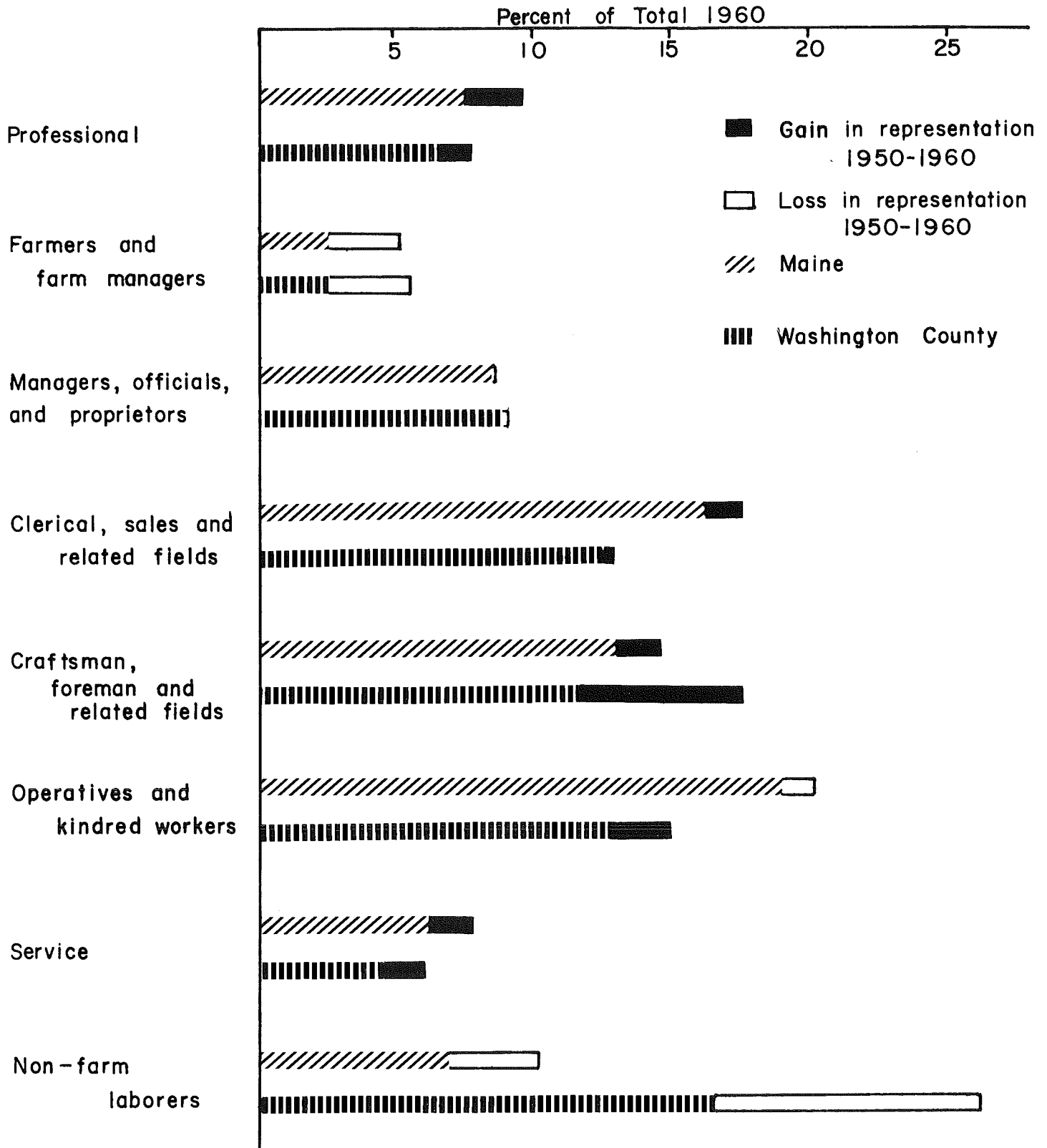


In addition to considering changes in employment levels, it is important to be aware of structural changes in the labor force, in other words, to know which occupations are gaining in relative importance and which are declining. Nationally, the labor force is moving into the white collar occupations, which require more training, and away from the blue collar occupations of semi-skilled and unskilled workers. This shift is greatly influenced by the fact that man is no longer needed to perform many of the tasks which are better suited to the machine. This is a broad, long-term change, but it is of great significance. In brief, it implies that those areas which cannot or will not move with changes in the national economy will have to be content with a low-wage economy. It is, of course, not easy to adjust to national trends and takes capital investment to do so. The textile industry is an example of one industry that has declined in New England because it could not keep up with competition from other areas. Part of the reason for this was cheaper labor in other areas, but another important factor was a resistance to mechanization and moving ahead generally in the textile field. This trend is changing and many New England textile manufacturers are making advances in production techniques and showing profits.

One of the significant trends in Washington County is that it is not keeping up with the national and statewide movement toward greater emphasis on white-collar activities. For example, while laborers

FIGURE 23

CHANGES IN OCCUPATIONAL STRUCTURE 1950 - 1960  
 MAINE AND WASHINGTON COUNTY



Source: U.S. Census of Population 1950 And 1960

lost representation during the past decade in both Maine and Washington County, they still comprise a far greater proportion of the labor force in the County than is found in the State (see Figure 23). On the other hand, the County's professional and clerical labor force is less well-represented than in the State as a whole.

These facts are generally well known, but their implications, which are vital to the economic future of the area, are perhaps less thoroughly understood. They imply that the area does not need, because it will not benefit from, just any type of employment growth. The problem of low wages will not be solved by adding industries which are marginal profit makers. This is evident in areas where today's marginal industries are replacing yesterday's. In several northern New Hampshire communities low wage marginal industries such as leather are moving in because they cannot survive in the more prosperous southern sections. They are indeed providing jobs - but since major advances in production techniques are not taking place, these industries will not be able to keep pace with wage advances in other areas - and the communities they locate in will not benefit. Further, wages will remain low and future prospects for growth will be minimal.

There is another serious drawback to these industries - they are heavily dependent on female workers. In communities where this

type of industry dominates there is a lack of employment opportunity for men. This situation is both economically and sociologically devastating - and reinforces a cycle of near-depression which is difficult to break.

Washington County will not benefit, therefore, from "just any industry" but must carefully assess the benefits and liabilities of various directions of economic growth.

For the purposes of highway location it is most important to know where employment concentrations exist, and where growth is taking place. Highway improvements should be directed toward improving access to and between growth areas or areas where there is potential for it.

Manufacturing activities are responsible for the bulk of Washington County's exports, therefore they are responsible for the dollar inflow. Thus their location and trends, in specific areas, are of considerable importance for highway location.

The following Table 7-5 presents employment and wage trends for manufacturing in Washington County's economic areas, and, for comparison, two major nearby areas - Bangor and Ellsworth. Calais is the economic center of the Study Area followed by the Lubec - Eastport areas. Both Machias and Jonesport have fewer manufacturing

jobs. The Lubec - Eastport areas have faced difficulties in the food-processing industries and have lost jobs recently. Calais, on the other hand, is gaining dominance in the manufacturing field. Machias is adding jobs at a moderate rate, although there has been a very recent (August, 1968) closure of a fish processing plant. The Jonesport area also displays a declining situation. Balancing the gains and losses, the Study Area has not added jobs in the past six to eight years. It is an important fact, however, that Calais continues to grow, providing a focus for development.

TABLE- 7-5

AVERAGE GROSS WAGE AND EMPLOYMENT TRENDS  
IN MANUFACTURING (1960 and 1966)  
FOR SELECTED ECONOMIC AREAS\*

Economic Area	Average Gross Wage			Employment		
	1960	1966	% Change	1960	1966	% Change
Calais-Baileyville	\$4,362	\$6,386	+46.4	1,050	1,193	+13.6
Lubec-Eastport	2,785	2,952	+ 6.0	961	834	-13.2
Machias	2,973	3,608	+21.4	258	281	+ 8.9
Jonesport	2,082	2,455	+17.9	416	349	-16.1
Washington County	3,316	4,484	+35.2	2,833	2,769	- 2.3
Bangor-Oldtown	3,966	4,661	+20.6	5,544	6,081	+ 9.7
Ellsworth-Bucksport	4,850	6,197	+27.8	1,097	1,200	+ 9.4
Maine	4,023	4,799	+19.3	107,244	116,617	+ 8.7

\* See Figure 14 for definition of economic area.

SOURCE: The Maine Handbook - A Statistical Abstract - 1968



Wage levels in southern Washington County are generally lower than those in the State as a whole or in nearby employment centers. The important exception again is the Calais area where average wage levels have expanded rapidly and are currently higher than those in the State. Wage levels in Machias are lower than average but remain higher than those in either Lubec or Jonesport.

Since 96% of all Washington County's manufacturing employment is found in the coastal areas, the data discussed here apply primarily to the area presently being studied. Manufacturing workers in Washington County are primarily in the food, lumber, textile and chemical industries. As Table 7-6 illustrates, employment in the food industry has declined in recent years along with that in the lumber and wood industries. However, textile and chemical industries have grown and show potential.

TABLE- 7-6

NUMBER OF MANUFACTURING WORKERS AND WAGES IN  
WASHINGTON COUNTY, 1960 and 1966

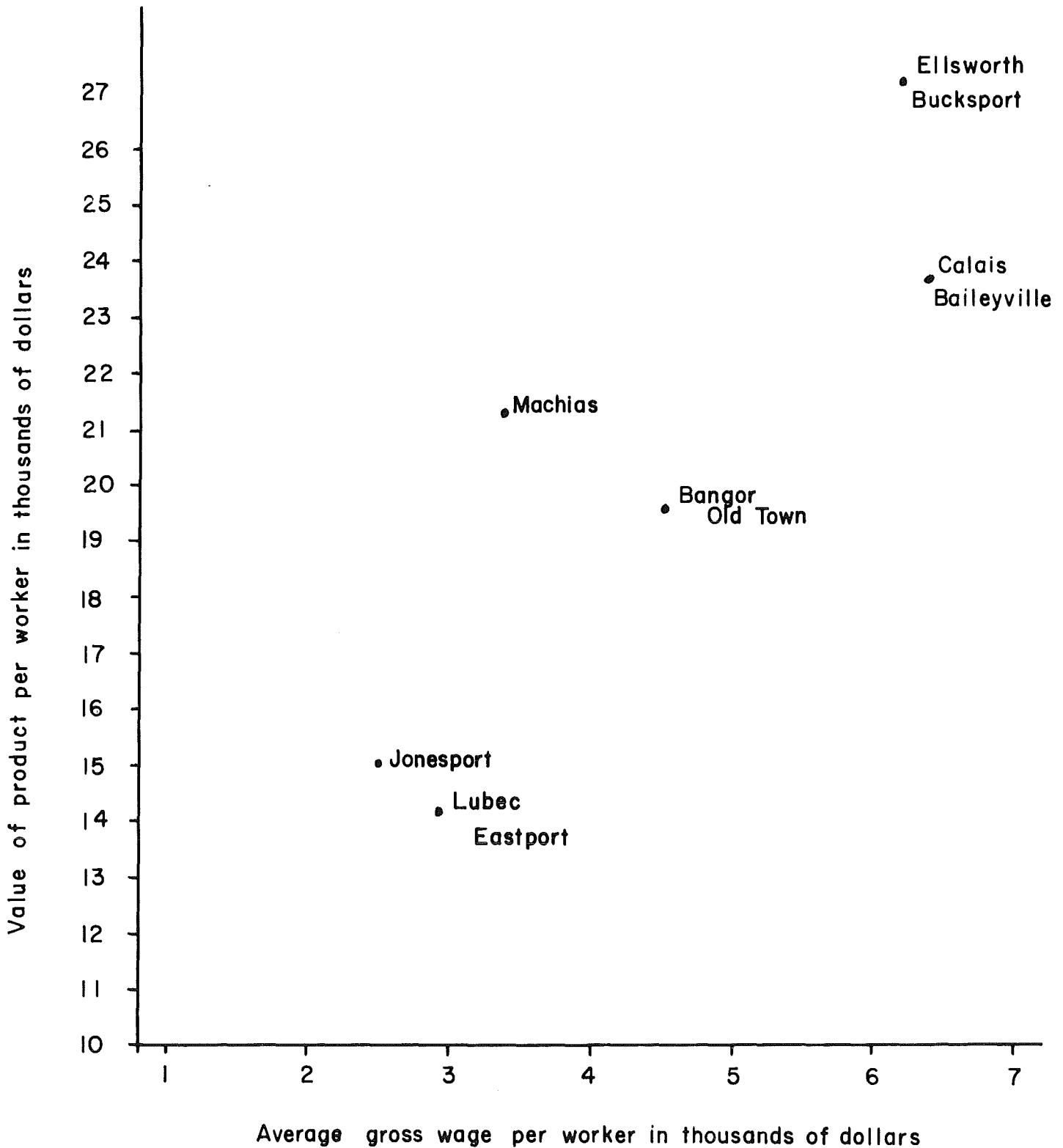
INDUSTRY	EMPLOYMENT		AVERAGE GROSS WAGE	
	<u>1960</u>	<u>1966</u>	<u>1960</u>	<u>1966</u>
Food	1, 115	930	\$2, 105	\$2, 208
Textiles	---	216	---	3, 936
Lumber & Wood	630	531	3, 178	4, 243
Printing	13	---	3, 700	---
Chemicals	57	116	3, 644	4, 298
Stone, Clay & Glass	<u>---</u>	<u>---</u>	---	3, 547
TOTALS	1, 815	1, 793		

In regard to wages, the chemical and lumber industries offer the highest returns with the declining food industry paying the lowest wages. Wage levels are almost directly related to the value of the product produced. Where product value is low, wages are low. The following, figure 24, illustrates this point rather clearly. The implications are clear. In order to maximize wage levels in Washington County employment must concentrate, more than it does now, in industries which produce goods of a fairly high value. While it is not likely that the lumber and wood industry will employ many more workers, it will remain an important employer and the chemical industry will probably become more important.

While Washington County faces many economic problems, there is potential on which to build future improvements. Highway development plans can take this into account and aid the development process. The Calais and Machias areas are growing and pay somewhat higher wages than other areas in the County. Thus highway induced development will have a starting point there. By providing improved access between these areas first, growth would not be deflected from the County as it might if links were constructed first with more prosperous areas such as Ellsworth. In addition, population and employment concentrations are greatest in the Machias and Calais areas and improved access would stimulate communication between them.

FIGURE 24

VALUE OF PRODUCT BY AVERAGE WAGE PER WORKER, 1966  
MANUFACTURING INDUSTRIES FOR SELECTED ECONOMIC AREAS



Source: Maine Handbook: A Statistical Abstract

The very fact that they would be closer to each other in terms of time would encourage communication and therefore development.

In spite of past declines, the total employment level in Washington County may be expected to rise in the years ahead. When based on forecasts prepared by Arthur D. Little, Inc. for the U.S. Army Engineering Division, total employment in the County is forecast to grow by 1,300 - 1,500 in the next 15 years and reach 16,800 by 1980. Manufacturing net gains should account for between ten and fifteen percent of the total growth. These fairly modest gains are consistent with past trends and there is no other sound basis for judging what the future will look like. The ultimate goal, however, is not necessarily to make an accurate forecast of employment, but rather to assess which industries have growth potential, recognizing that extensive effort will be required to realize this potential.

The following statements consider the potential of several industries presently located in the Study Area.

The textile industry has a future in the area as evidenced by recent employment gains and the fact that a major quality manufacturer has recently located in Calais. Wages in this industry are relatively high for Washington County but nationally production workers in the textile industry fall toward the bottom of the wage scale.



Lumber and wood will probably not gain in employment significantly because of recent modernization projects which automated certain functions, thus decreasing employment requirements. It is, however, a high wage industry and therefore will continue to contribute to the region's financial stability.

Food processing functions have declined recently, but this trend could be reversed if more modern methods of processing are initiated. For example, the blueberry yield can be more than doubled - and canning operations could be expanded. In the fisheries sector of the industry, innovations would help maintain employment levels. It is difficult to predict just how extensive growth could be since "human" factors, as opposed to pure economic forces, are of great importance.

The chemical industry could have a bright future in the Area if the free trade-zone in which petroleum will be processed is located in Machiasport. The U.S. Department of Commerce in its 1966 Industrial Outlook publication states that: "Petroleum sources now provide 85% of the benzenoid chemicals, the principal materials used in manufacturing coal tar intermediates". The demand for these intermediates is expected to grow because they are used in several expanding industries - namely plastics and man-made fibers. The chemical industry includes the production of the man-made fibers and, since employment in chemicals has shown recent growth in Washington County, could be

expected to expand considerably, given the presence of a petroleum processing plant.

The main conclusion to be drawn from the above analysis concerning the most appropriate location for either highway improvements or a new express highway is that the Southern Alternate would be the most beneficial in terms of stimulating employment growth. This alternate would serve the dual function of carrying traffic, not interested in stopping in Washington County, through it, and at the same time serve those wishing to travel between the County's population and employment centers.

C. Effect of the New Highway Upon Retailing

Most residents of southern Washington County satisfy their immediate needs for retail goods locally. They look to Bangor, however, for larger purchases and for employment information. The Calais Advertiser reaches north to Oak Hill and south to Trescott. The Machias Valley News, which publishes advertisements for Calais businessmen, is used mainly by residents of communities between Lubec and Cherryfield. The Washington County edition of the Bangor News is circulated to 7,545 homes, thereby reaching about 86% of the population. (Source: "ABC Facts - The Basic Measures of Circulation Values"). Thus, the Bangor paper has a considerably larger circulation than either the

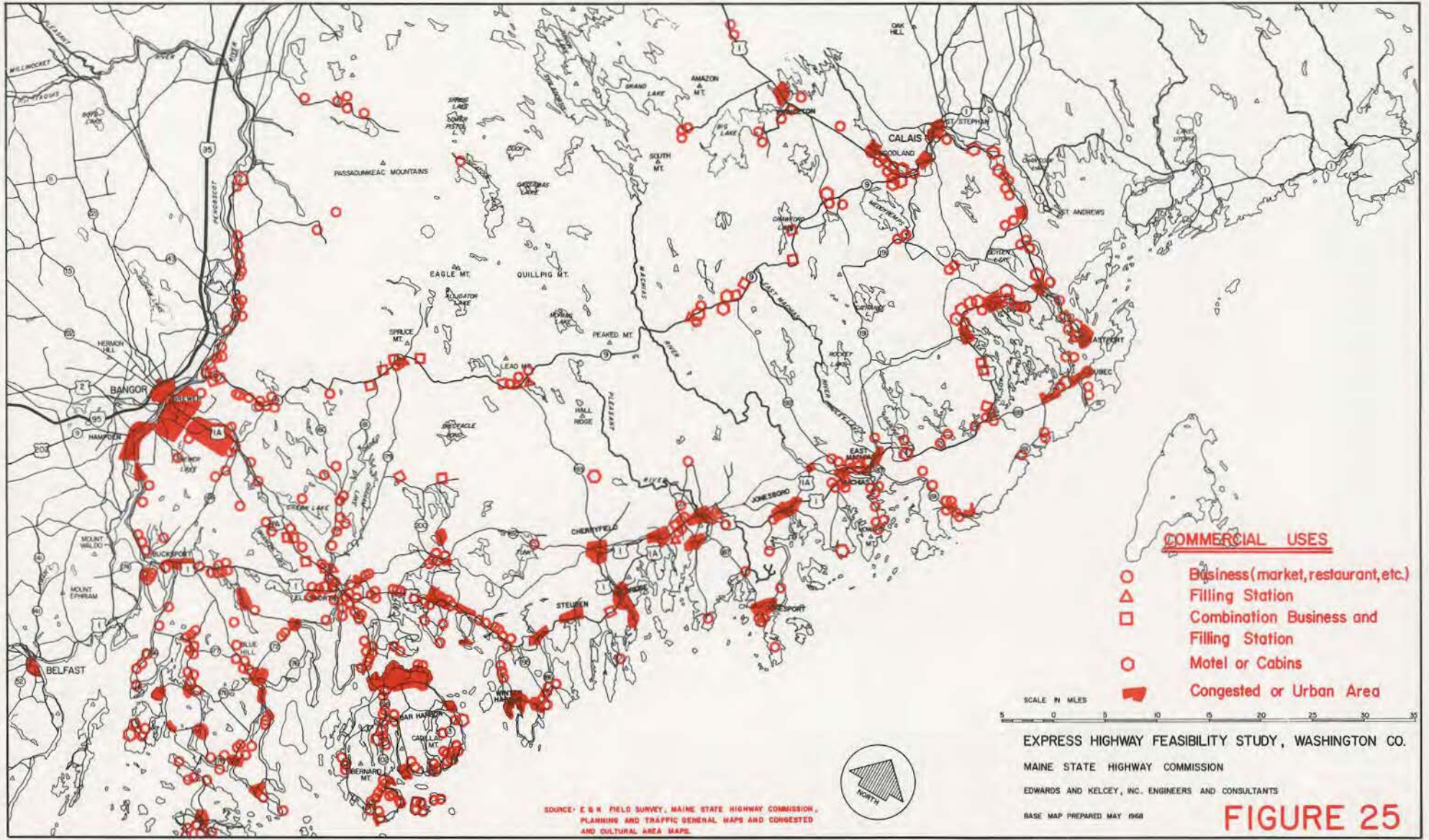
Machias or Calais papers and indicates that most people in the Area look for the broader coverage provided by the Bangor paper.

The communities in Washington County are oriented about a main road connecting them to adjacent communities. This road carries an increasing, although still quite low, volume of through traffic intent on maintaining a high average speed and having a generally low familiarity with local traffic connections. These factors constitute a potential for accidents. All of the larger communities have obsolete street systems which have little capacity to accommodate any appreciable growth in traffic. The main roads through these towns are already unsatisfactory for the traffic mix they must serve: parking, local, collector, arterial, and through inter-regional traffic.

A crucial question in the consideration of the location of an express highway through Washington County is the impact that such a highway would have upon the commercial establishments which it by-passes. The Chamber of Commerce of the United States is, on behalf of its members, concerned about the affect of by-passes upon business. Its Transportation and Communication Department, Gerald H. Collins - Manager, has published a booklet explaining "How Bypasses Affect Business".\* It is an excellent presentation and cannot be accused

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\* A similar study published by the National Academy of Sciences in 1965, and quoted in the Ellsworth Traffic and Highway Planning Study, showed that total retail sales increased in 28 out of 36 communities which were studied. (20 of these were under 5,000 population.)





INDEX TO CONGESTED AND URBAN AREAS NUMBERED ON THE  
 "COMMERCIAL USES" MAP (B = BUSINESS, F = FILLING STATION,  
 C = COMBINED BUSINESS AND FILLING STATION, M = MOTEL, HOTEL OR  
 CABINS)

AREA NUMBER	NAME	USES
1	Princeton	B-18, M-1
2	Woodland	
3	Baring	B-5, M-1
4	Calais	
5	Robbinston	B-7, M-1
6	Perry	B-4, C-3, F-1
7	Pembroke	B-17, M-1, C-1
8	Dennysville	B-3, M-1, F-2, C-1
9	Quoddy Village	B-15, M-1
10	Eastport	
11	Lubec	
12	Lubec Neck	B-9
13	West Lubec	B-4
14	Cutler	B-5
15	East Machias	B-21, M-1, C-2, F-4
16	Machias	B-7, M-2
17	Whitneysville	B-4
18	Jonesboro	B-8, M-1, C-2, F-3
19	Jonesport	

INDEX TO CONGESTED AND URBAN AREAS NUMBERED ON THE  
 "COMMERCIAL USES" MAP (Continued)

AREA NUMBER	NAME	USES
20	Columbia Falls	B-5, M-1, C-1
21	Addison	B-8
22	Harrington	B-17, M-2, F-3
23	Cherryfield	B-12, M-1, F-3
24	Milbridge	B-26, M-1
25	Steuben	B-1, M-1, C-2, F-1
26	Gouldsboro	B-3, C-1
27	Birch Harbor	B-5
28	Winter Harbor	B-17
29	Sullivan	B-6, C-1, F-1
30	North Sullivan	B-5, F-2
31	Franklin	B-11
32	Sorrento	B-3, M-1
33	North Bar Harbor (including Hulls Cove, Salsburg Cove)	B-49, M-1, F-1, C-1
34	Bar Harbor	
35	Manchester Point	B-37, M-1
36	Southwest Harbor	B-26, M-1
37	Somesville	B-4
38	Bass Harbor	B-10
39	Corea	B-5

INDEX TO CONGESTED AND URBAN AREAS NUMBERED ON THE  
"COMMERCIAL USES" MAP (Continued)

AREA NUMBER	NAME	USES
40	Washington Jct.	B-6
41	Surrey	B-6
42	Blue Hill	B-29, M-2
43	Brooklin	B-8
44	Sedgwick	B-6
45	Deer Isle	B-16
46	Brooksville	B-3, M-2
47	South Brooksville	B-5
48	North Brooksville	B-3
49	Castine	B-21
50	Penobscot	B-5
51	Orland	B-14
52	South Orrington	B-10
53	North Orrington	B-10
54	Brewer	B-7, M-1
55	Holden (including East Holden)	B-13, M-7, C-1

of an anti-business bias. It sums up the advantages and disadvantages of bypass routes as follows:

Diversion of through traffic to a bypass benefits both the through traffic and the local traffic from which it is separated. Local city streets, divested of through traffic, provide increased capacity for local traffic which generally results in an increase in this local traffic. Principal advantages are:

1. Business activity generally increased due to improved traffic conditions. The loss of tourist trade is usually more than offset by increase in local trade, and truck drivers do not normally shop in the business centers anyway.

(More than half of traffic approaching cities under 5,000 population is through traffic: 27% to Central Business District, 20% to other points in City and 53% through traffic.)

2. Property values may increase in area traversed by the bypass because of increased accessibility. Property values in bypassed area may also be upped due to improved traffic conditions.
3. Parking made more convenient, due to reduced conflicts between parking vehicles and through traffic.

4. Pedestrian safety and convenience increased through reduced volume of heavy, fast through traffic.
5. Fewer traffic accidents and delays on city streets due to separation of local and through traffic.
6. Less wear and tear on city streets caused by heavy, long-distance truck movement. Many local streets were not originally designed for this type of traffic, while bypasses are generally built to carry such vehicles.
7. Reduced noise, exhaust fumes and traffic conflicts caused by through traffic, enhancing utility of business districts.
8. Reduced hazards of explosion, fire and gas leaks from trucks (carrying liquified petroleum gas and other explosive or inflammable products) traveling through crowded streets in business districts.
9. Through traffic is expedited and accorded savings due to avoiding unnecessary delay and accident hazard.
10. Local traffic control is simplified. Traffic control and allocation of street space in the bypassed area can be aimed 100 percent at facilitating local traffic, instead of making compromises to include through traffic as well.



The principal disadvantage is the possible loss of revenue from tourists and other through traffic. This results in opposition by owners of affected roadside establishments who fear a loss in trade. Opposition may also be voiced by those who would be prevented from creating a shoe-string development of roadside businesses where the bypass is a controlled-access facility.

The Chamber of Commerce concludes from its nation-wide study that real estate values increase both along the new route and on the bypassed "Main Street". They cite numerous examples of long-vacant Main Street frontage lots being sold or developed soon after bypass completion.

Their specific research involving cities of comparable size to those in Washington County was, regrettably, concentrated in California, but the facts gathered, presented below, demonstrate what really happened in actual cases where bypasses were constructed.

TABLE- 7-7

NET EFFECT OF BYPASS ON BUSINESS, BY TYPE

	Popu- lation	Number of Businesses Bypassed	Cafes and Bars	Service Stations	All Others
Templeton	600	24	- 9.04%	- 1.82%	+20.34%
Folsom	1,706	36	+ 7.4 %	+ 5.0 %	- 1.0 %
Imperial	1,736	21	+ 1.5 %	+ 2.72%	+ 0.5 %
Anderson	2,200	21	+132.0 %	-31.0 %	+22.0 %
Auburn	4,577	74	+ 5.0 %	+21.0 %	0.0 %
Fairfield	5,000	109	+ 14.0 %	-21.0 %	+ 7.5 %
North Sacramento	6,016	224	+ 11.5 %	+25.5 %	+21.5 %
Escondido	6,608	67	+ 11.95%	+25.6 %	+12.7 %

There is no doubt that a certain amount of trade may be lost to some few individuals; however, businessmen point out that this is generally more than offset by benefits to the entire community, assuming, of course, that construction of the bypass is warranted. In general, the more stable types of business houses are benefited, while those injured are the types with least secure tenure.

It is inevitable that the Washington County Express Highway, wherever its location, will bypass the urban and congested areas. What

of businesses outside of these areas? The field inventory indicated the following uses outside of the urban and congested areas:

TABLE- 7-8

<u>USE</u>	<u>NUMBER OF ESTABLISHMENTS</u>			
	<u>Rte. 1A</u> Dedham - Ellsworth	<u>Rte. 1</u> Ellsworth- Machias	<u>Rte. 1</u> Machias - Calais	<u>Rte. 9</u>
BUSINESS (Market, restaurant, etc.)	10	32	20	18
FILLING STATION	1	3	0	5
COMBINATION BUSINESS & FILLING STATION	4	3	5	13
MOTEL	0	2	10	6

Improvement of the road immediately in front of these businesses would involve acquisition of some of the businesses' property and, if the road is to expressway standards, restricting access to them. This would involve considerable expense to the State and inconvenience (or termination) to the business.

However, most of these establishments are clustered near the intersections of the North-South highways (92, 91, etc.) with Routes 9 or 1. Construction of a new road to expressway standards on a new right-of-way, with interchanges with these other roads, would provide access

to the businesses and not involve the expense (to the State) or the inconvenience (to the individual) of a road immediately adjacent to the businesses.

Most roadside businesses have two set of customers: the through motorist and the local resident. Those businesses that are most dependent upon the former are obviously most affected by bypass construction.

The existing strips of commercial development on Routes 9 and 1 between future expressway interchanges would feel some impact from the removal of through traffic. It is felt, however, that sportsman traffic on 9 and sight-seeing traffic on Routes 1, both proceeding at a more leisurely rate with the removal of straight-through traffic, could compensate for and reverse this impact.

At those interchanges in the vicinity of population centers there would be future demand for shopping center development although it would be 10-20 years before a center large enough to rival the existing downtowns could be justified.

An expressway is "limited access" - no business can locate along it. The uses of the land along roads interchanging with the expressway are subject to local planning board control through zoning. If it is determined by the planning board that commercial uses along these roads

are not desirable, they should so zone them. If they feel that a specific number of shopping center locations are all that is justified, they can preclude more. If they do not want "strip commercial", they can preclude this. Local zoning ordinances or (as suggested editorially by the Calais Advertiser) County-wide zoning should accompany express highway construction.

The time savings from Washington County to Bangor on the alternate expressways are not of sufficient magnitude to have a noticeable impact on local shopping habits, except for some seasonal purchases such as "Back to School" clothing and perhaps major appliances. Even in the latter areas the change in buying habits will not be great. Small local merchants will not be affected by the easier access to Bangor. The effect upon the small merchants of bypasses is discussed above.

A distinct problem in developing bypasses or express highways in an economy where these businesses are marginally successful exists if a bypass is constructed around only one community at a time for most of the "through highway" business will then be transferred to another community still on the main road. Scheduling should therefore be carefully considered so that the business does not transfer from one community to another only to be by-passed again at a later time.

In summary then, commercial development in the study area is



most extensive along the Cherryfield-Lubec-Calais axis. The larger communities in this area have an obsolete street system, which will not be able to accommodate any significant traffic increases. Furthermore, it has been demonstrated that highway improvements, in the form of bypasses, frequently stimulate increased business: When the Central Business District is freed from through traffic local residents are apt to use the area more frequently. In addition, there are a host of other benefits to be devised from a less congested situation. Businesses outside the congested areas would experience some negative impact from the construction of a bypass which would remove through traffic. However, recreation traffic could compensate for this impact.

In general, there will be both positive and negative consequences associated with highway bypasses, but the positive factors can be maximized and the negative ones minimized by the use of thoughtful zoning controls and careful timing.

8. - EFFECT OF NEW HIGHWAY UPON TOURISM, RECREATION, CONSERVATION, WILDLIFE, AND HISTORIC AREAS

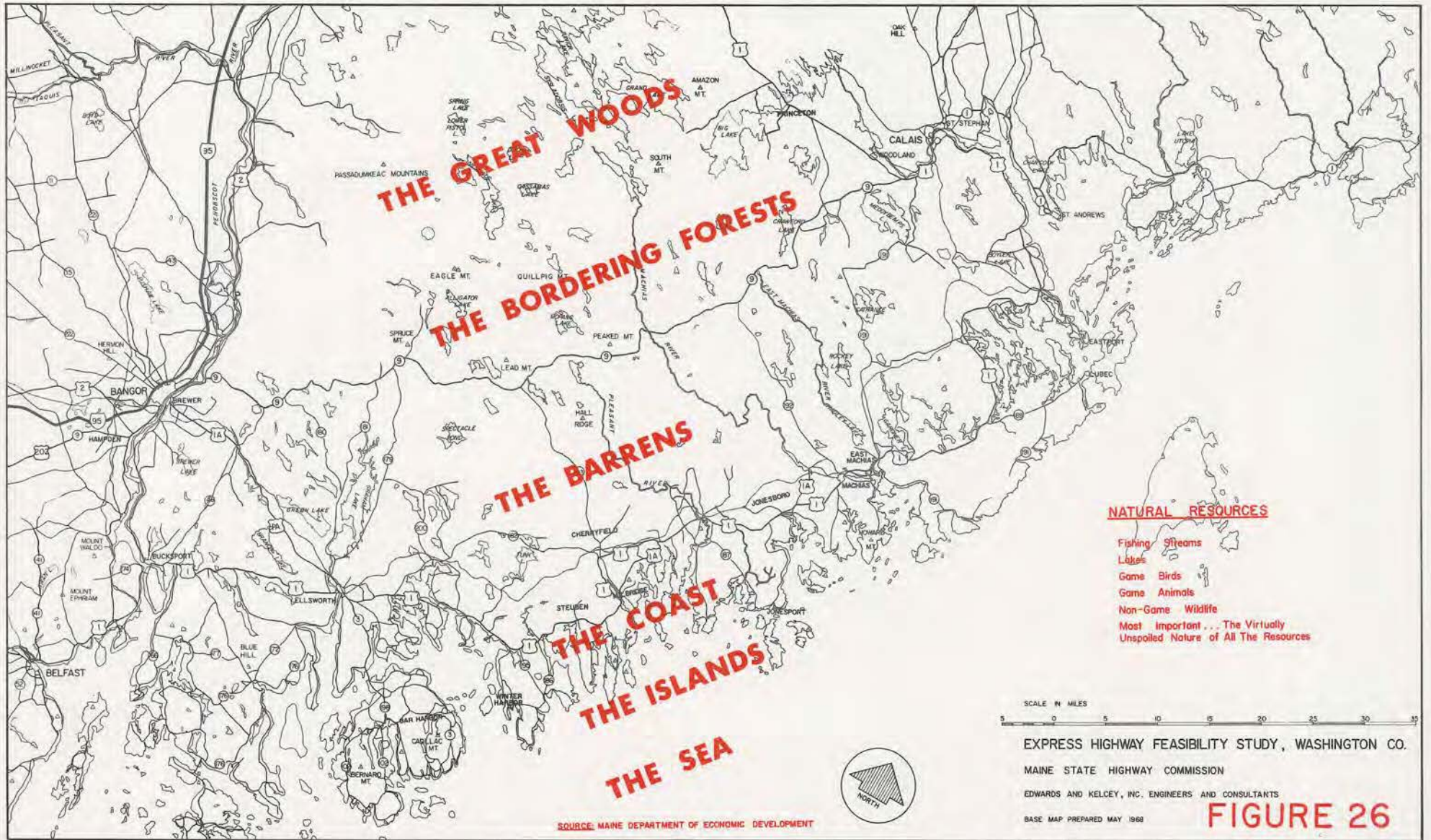
Washington County offers extensive and diverse opportunities for recreation, sport, and general touring. This section inventories and evaluates existing and potential recreational resources and facilities to ascertain their affect upon the several proposed highway locations.

The Washington County region is easily accessible by road. From the southern entrance to the State, Interstate 95 speeds the visitor to Bangor where he can connect with Route 1 at Ellsworth, or Route 9 (known as "The Airline") at Brewer; or he can continue on Interstate 95, turn off at Howland, proceed to Lincoln and take Route 6 across the northern section of the County to Topsfield and Vanceboro.

The northern part of the County, referred to in Planning Guide as the "great woods", contains hundreds of square miles of uninhabited forests, interspersed with glacial lakes and linking streams. Timber is harvested in this area, making space for small shrubs and other new growth on which deer and moose feed. Here, the hardest hunter, fisherman, or camper can find vast tracts of unspoiled, almost wild land.

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\* This inventory relies in part on the excellent and comprehensive A Planning Guide for Outdoor Recreation in Washington County, Maine, 1963, Burke and Rushmore, Forest Service, U. S. Department of Agriculture.



To the south of the "great woods" are the "bordering forests", for the most part indistinguishable from the "great woods" except that there is more access by road, settlements and farms are more frequent, and the land is divided into smaller tracts. As the Planning Guide states: "Almost all of the recreation values of the great woods are present except vastness...these are the forests that the average visitor will enjoy".

Lakes, rivers and forests of both areas abound with wildlife, providing excellent hunting and fishing. Atlantic salmon make their way up the Narraguagus, Dennys, Pleasant, and Machias rivers. Fresh water fish include: brook trout, lake trout, landlocked salmon, smallmouth bass, chain pickerel; white and yellow perch, hornpout, togue, and sunfish. Equally attractive to the hunter are the area's whitetail deer, black bear, snowshoe hare, and numerous game birds including: woodcock, black duck, mallard, blue wing and green wing teal, among others. Moose are present, but may not be hunted. Lumber company officials, in addition to State Fish and Game Department wardens, patrol the area offering assistance and information,

In addition to hunting and fishing, the area is rich in other sporting and touring opportunities. Although ski areas are generally undeveloped, the region is ideal for cross-country skiing and motor skiing on the many logging roads and trails. In the summer these same trails are ideal for "trail bike" motorcycles. Small boats, outboard motors,

and canoes may be rented at most commercial camps on the larger lakes. The St. Croix Pulpwood Company owns immense tracts of land in northern Washington County -- all of which are open to the public for hiking, fishing, hunting, boating, and swimming. The Washington County Development Authority has recently built boat landings on some of the northern area lakes. Fish hatchery rearing pools and fish ladders for Atlantic salmon are of touring interest.

Unspoiled natural beauty is the greatest single recreational asset of the northern forest regions. Accordingly it is imperative that these natural assets be effectively preserved, while access to the area is provided to all those willing to seek it out. Massive kills of fish (e. g., on the St. John River) have resulted from water pollution. Threatened depletion of the moose population brought on the current ban on moose hunting. Knowledgeable squaretail trout and salmon fisherman have said that fishing is not what it used to be. Only effective conservation of wildlife and natural resources, then, can guarantee preservation of this area's vulnerable recreational value.

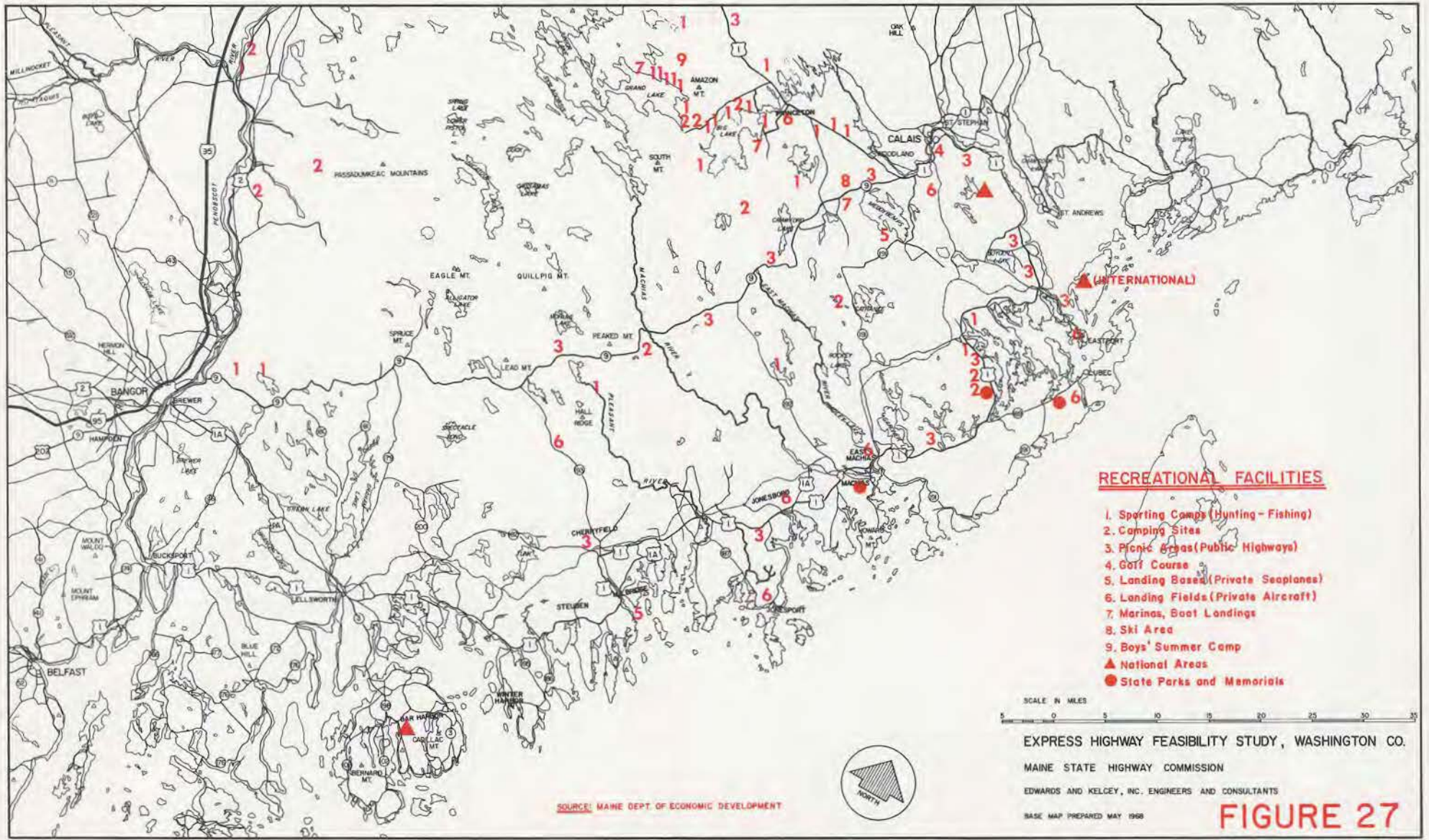
Lakes instead of access roads appear to be the controlling factor in the placement of the 35 sporting camps and the 12 camping sites shown on the accompanying "Recreational Facilities" map. None of these camps is located less than 10 miles from a lake, while most were removed much more than that distance from Routes 1 and 9. cursory inspection of this map



reveals a large cluster of camp sites around the West Grand Lake - Big Lake complex. These locations are moderately accessible by water and/or access roads from Route 1. Statistics set forth in other sections of this report confirm that Routes 1 and 6, the logical accesses to the lake-forest area, are well below capacity use, thus indicating that they now provide more than adequate access to the area. Washington County's great distance from major population centers necessitates that the non-local visitor spend a prolonged period in the area, thus minimizing the importance of high speed access to the area by Route 9.

It is concluded that the nature and extent of recreation resources and facilities north of Route 9 do not alone justify development of Route 9 beyond its present state.

"Washington County's seacoast, one of the few relatively unspoiled coastlines in the northeast, is a unique feature of the recreation resource" (Planning Guide). Retreating glaciers etched 700 miles of rocky coastline in the 70 coastal miles from Milbridge to Perry. Picturesque fishing villages dot the coastline; coastal cliffs offer spectacular views; greatly fluctuating tides and tidal currents cause interesting natural phenomena (such as reversing falls of Pembroke) and expose numerous forms of sealife and flora. Harbor seals amuse the coastal visitor. The County's state parks and national areas are located here. All enhance the recreational potential of the coastal area.



**RECREATIONAL FACILITIES**

- 1. Sporting Camps (Hunting-Fishing)
- 2. Camping Sites
- 3. Picnic Areas (Public Highways)
- 4. Golf Course
- 5. Landing Bases (Private Seaplanes)
- 6. Landing Fields (Private Aircraft)
- 7. Marinas, Boat Landings
- 8. Ski Area
- 9. Boys' Summer Camp
- ▲ National Areas
- State Parks and Memorials

SCALE IN MILES



EXPRESS HIGHWAY FEASIBILITY STUDY, WASHINGTON CO.

MAINE STATE HIGHWAY COMMISSION

EDWARDS AND KELCEY, INC. ENGINEERS AND CONSULTANTS

BASE MAP PREPARED MAY 1968

**FIGURE 27**

SOURCE: MAINE DEPT. OF ECONOMIC DEVELOPMENT



Presently, the Washington County segment of Route 1 roughly parallels the southern coastline at an average distance of 5 miles inland before turning north at Whiting. Although the highway occasionally skirts coastal bays and inlets, those hoping to see the "rockbound coast of Maine" from Route 1 may not since many potentially scenic panoramas are obscured by trees, landscape, and occasional unsightly signs.

The visitor venturing off Route 1 in search of scenic coastal vistas may be equally disheartened as he would not know which roads provide access to the coastline from Route 1. These same roads may deteriorate or cease without warning. Parking along these roads and in some coastal towns is difficult. Planning Guide states that "lack of access is one of the greatest deterrents to the development of recreation in the coastal area of Washington County." It mentions as examples that "in Jonesport and Machiasport the visitor cannot walk on any pier without trespassing or violating insurance regulations." Similar access problems occur on the northern segment of Route 1. It is possible to leave Route 1 and drive entirely around Meddybemps Lake and find no good view of it.

Despite present shortcomings, the role of Route 1 in any future recreational development of Washington County's coastline should not be underestimated. Route 1 brings the traveler as close as possible to the coast, neither slavishly following nor threatening the beauty of the

County's irregular coastline. Route 1 is ideally located to serve as a high-speed feeder to a network of coordinated, low-speed recreational and scenic routes placed in such a way as to leave to the visitor the option of taking any one of several side trips, or touring the entire coastline, as his schedule allows. These potential recreational routes could be designed to accommodate foot, cycle, and light motor traffic safely, slowly, and pleasantly, while not impeding commercial traffic. The recreational value of such routes is emphasized by a recent report of the Outdoor Recreation Review Commission which found that "automobile riding for sightseeing and relaxation is the number one recreation activity in the Country today." Strategically placed, tastefully landscaped sites, with ample parking space, could be situated along such routes, thus offering the visitor a leisurely and rewarding view of the area. Marked networks of trails might radiate from these sites. In towns, an effort should be made to accommodate the visitor by providing visitor parking areas and availing scenic waterfront views to strollers. Careful attention to zoning and pollution would benefit both tourist and resident, rendering the area safe from the kind of commercial tinsel blighting many otherwise attractive New England areas.

Many such potential recreational routes, along existing or new roads, have been contemplated. Following are but a few possible road locations. Each individual segment would either directly or indirectly

connect with Route 1, which would function as the spinal column for an entire complex of recreational roads.

1. From Route 1 at Columbia to Jonesboro via South Addison and Jonesport, rejoining Route 1.
2. From Route 1 at Jonesboro to Machias and Route 1 via Roque Bluffs. Includes: Roque Island Group in Englishman's Bay and site of Fort O'Brien, Machias.
3. From Route 1 at East Machias to Lubec via Cutler and re-turning to Whiting at Route 1 via Route 189 from Lubec. Includes: good view of sea from cliffs near Cutler, tidal phenomena off Lubec, West Quoddy Head.
4. Calais southerly to Eastport on or along Route 1. Includes: Reversing Falls of Pembroke, tidal whirlpool off Eastport, Moosehorn National Wildlife Refuge, Red Beach on St. Croix Island.
5. From Route 1 at East Machias to Alexander via Route 191 and returning to Route 1 via Route 9.

The potential recreational roads briefly described above attest to the importance of Route 1's role in the recreational development of Washington County. If tourism along the coastline of Washington County



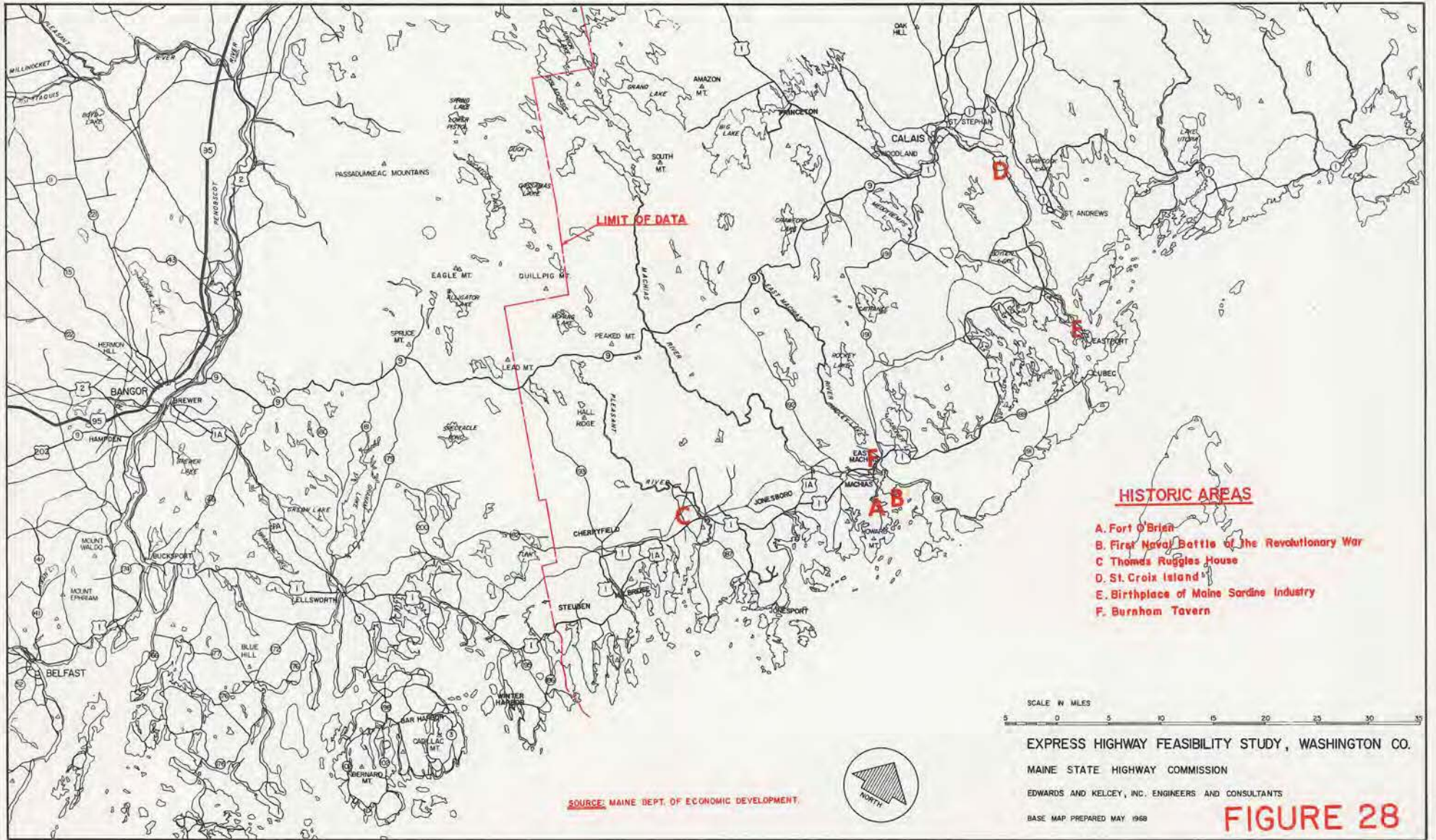
is ever to be suitably developed beyond its present state, then Route 1 will be the logical backbone of that effort. The recreational value of Route 1 is directly proportionate to the development of roads and tourist facilities along the coastline. In this regard, the Washington County Development Authority energetically and resourcefully used the moderate funds at its disposal to develop recreational areas along the southern portion of Route 1 near Milbridge, Pembroke, Machias, and Calais. Federal funds were used to establish a "self-guided tour" for individual motorists visiting the Moosehorn National Wildlife Refuge. From a recreational standpoint improvement of Route 1 could only be justified if there were serious plans (such as displayed by the Development Authority and the Federal Government) to develop this area for tourism; otherwise, Route 1 has done all it can for the recreational resources of the area.

As demonstrated earlier in this section, a greatly improved Route 9 would have little bearing on existing and future recreation north of that area. The same is true for the area between Route 9 and Route 1 where, although recreation resources are similar to those north of Route 9, existing recreational facilities are far less in number. Apart from the quietly beautiful array of flora and rolling hills in the Blueberry Barrens, there are fewer lakes, and those few are much less spectacular than those in the north. Routes 92 and 93 connect

Routes 1 and 9. In the rough quadrangle struck by these four roads, there are only a few unimproved gravel surfaced roads. Of the highway locations under consideration, recreation in the area would least affect the feasibility of a new or improved road running parallel to and between Routes 1 and 9. Such a road would stimulate recreation only insofar as it would facilitate casual and sporadic building of access roads into the surrounding area.

For the motorist to visit the historic sites in Washington County will require a special "side-trip" whichever of the alternates is selected. The southern alternate does, however, pass closest to these sites. The sites are indicated on the Historic Areas Map and are inventoried below.

- A. Fort O'Brien, Machiasport, built during the Revolutionary War to guard the approaches to the Machias River.
- B. First Naval battle of the Revolutionary War, Machias. The British Schooner "Margaretta" was captured five days before Bunker Hill.
- C. Thomas Ruggles' house, Columbia Falls, noted for its staircase and woodwork.
- D. St. Croix Island, a national monument in the St. Croix River. First white settlement north of St. Augustine, Florida, 1604.



- E. Birthplace of Maine Sardine Industry, Eastport, 1875.
- F. Burnham Tavern, Machias. The Captain of the schooner "Margaretta" died here the night after the first Naval battle of the Revolution (See B above).

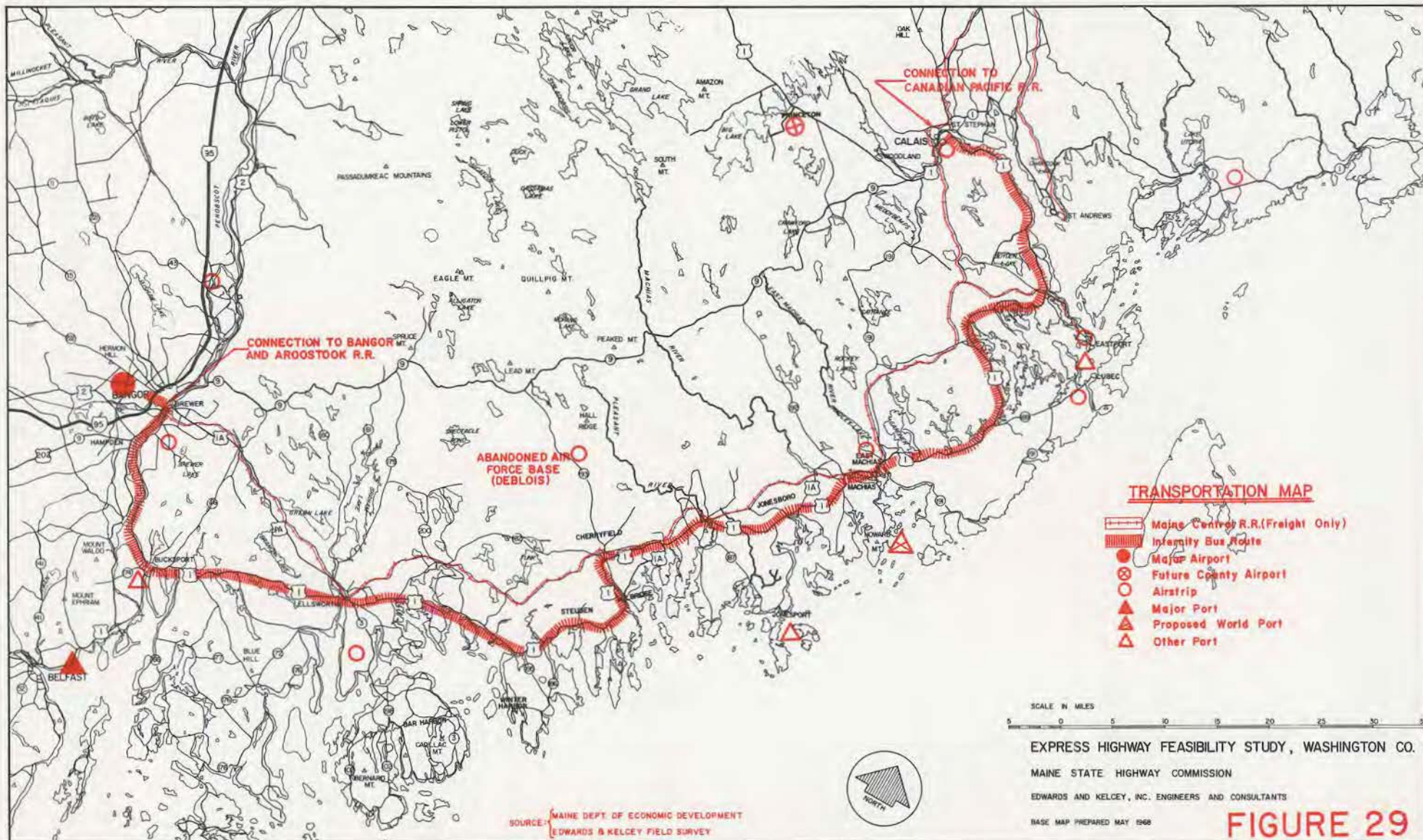
9. - EFFECT OF NEW HIGHWAY UPON TRANSPORTATION

A. Railroads

Washington County is served by the Maine Central Railroad Company, which connects with the Bangor and Aroostook at Bangor and with Canadian Pacific at Calais. The Company's miles of rail in operation throughout the State have steadily declined from 838 in 1950 to 788 in 1965. Freight revenue has remained practically constant at approximately \$20 million during the same period.

The Maine State Transportation Commission's 1967 report states that the railroads of Maine have lost freight traffic to rival modes of transport and that one reason for such loss has been the unbalanced promotion of other transportation facilities by both Federal and State governments. The report adds that, "this is not the only reason. There has been promotional activity to be sure but this has interacted with technological developments, population shifts, industrial migration, and the growing demand of some shippers and travelers for faster service at higher costs and of others for lower-cost service even if slower and less adequate. Maine railroads have also been somewhat restricted by the handicap of a slow growth in all-year population and in the type of industry that generates a heavy amount of rail freight traffic. With the exception of the expanding paper industry, growth in manufacturing has













CONNECTION TO BANGOR AND AROOSTOOK R.R.

CONNECTION TO CANADIAN PACIFIC R.R.

ABANDONED AIR FORCE BASE (DEBLOIS)

**TRANSPORTATION MAP**

-  Maine Central R.R. (Freight Only)
-  Intercity Bus Route
-  Major Airport
-  Future County Airport
-  Airstrip
-  Major Port
-  Proposed World Port
-  Other Port

SCALE IN MILES  
 0 5 10 15 20 25 30 35

EXPRESS HIGHWAY FEASIBILITY STUDY, WASHINGTON CO.

MAINE STATE HIGHWAY COMMISSION

EDWARDS AND KELCEY, INC. ENGINEERS AND CONSULTANTS

BASE MAP PREPARED MAY 1968

**FIGURE 29**

SOURCE: MAINE DEPT. OF ECONOMIC DEVELOPMENT  
 EDWARDS & KELCEY FIELD SURVEY



been concentrated in industries that do not generate large tonnages of traffic or whose products find some other form of transport than rail more preferable in their scheme of distribution. Under these conditions the State has been incapable of producing enough traffic to prevent curtailment of rail operations."

Rail can never reassume its former major role in the County's transportation picture and will have to undergo improvements as major as straightening of its circuitous right-of-way -- a near financial impossibility -- if it is to hold its own. Construction of an express highway into and through Washington County will make rail shipment less attractive, whichever alternate is selected, and will divert tonnage from it.

Passenger revenues state-wide declined from \$3.5 million in 1950 to \$8,000 in 1965. Passenger service has been totally discontinued and there is no reason to expect that it will be re-introduced.

#### B. Airports

There are several small private-plane airports in Washington County, but no regularly scheduled airlines fly to the County. State-wide, air is assuming a more and more important role in the overall transportation picture.

The Maine State Transportation Commission's first annual report to the Governor (1967) summed up the air transportation situation as follows:

Rail passenger transportation in this State virtually disappeared at a time when pleasure and personal travel demands are rapidly expanding. At the same time, airline fares and rates are trending downward, personal incomes are rising fast, leisure, education and appreciation of travel are increasing. Passenger traffic has increased and it is expected that this trend will continue. Air freight service is becoming of increasing importance in Maine, particularly for perishables. It is also used increasingly by manufacturing industries in the State and those which ship to Maine points. Many such industries have increased their efficiency of production, distribution and re-order cycling to such an extent that the fastest available transportation is a necessity.

Northeast Airlines, Inc. connects Bangor directly with Boston, Portland, New York and Montreal. From these cities flights are available to all other points. Northeast is the only airline serving Bangor that holds a Certificate of Convenience and Necessity from the Civil Aeronautics Board. However, Executive and Trans-east International also provide regularly scheduled flights. They employ planes with under 12,500 pounds take-off weight and are thus entitled to operate without the C. A. B. certificate (although under regulation). There are also a number of companies with the smaller planes that do not maintain regular schedules, but operate seasonally or on charter.

There are also, of course, many private planes capable of using the facilities at Bangor and in Washington County. Some of them are

licensed in Maine, others in neighboring states and Canada. An idea of the increase in private plane usage can be seen in the following table from the Transportation Commission's first annual report:

<u>Private Planes Licensed in Maine</u>			
	<u>Single-engine</u>	<u>Multi-engine</u>	<u>Total</u>
1955	385	2	387
1960	400	6	406
1965	460	24	484

The rapid increase in use of air travel can be seen by the Transportation Commission's figures for Bangor:

<u>Passengers</u>		
	<u>Enplaned</u>	<u>Deplaned</u>
1955	22,944	22,453
1960	30,568	30,314
1965	46,047	44,817

During the same period air freight increased from 143,805 pounds to 382,925 and air express from 33,842 to 40,885. There is capacity for further increases in both.

The currently-underway conversion of Dow Air Force Base with its 11,400-foot runway into Bangor International Airport will provide

northern New England with an alternative to Boston's Logan. (The Airport received its "International Baptism" August 12, 1968, when a 165-passenger Air France 707 landed for re-fueling.) U.S. Customs Service must be made available before international flights can be made on a regular basis. It seems inevitable that as Logan grows more congested (a site in Dover, Mass. is now under study as a location for a \$400 million supplement to Boston's Logan Airport) Bangor will assume an important role. Its international role, other than as a refueling or stop-over on the way to interior cities, will not, due to the sparsity of immediately adjacent population, rival Logan. On the other hand, the Airport can enlarge its major regional role, providing direct connection to Boston and New York, but also with direct flights to interior cities without the necessity of always changing in Boston or New York. Northeast and Transeastern International now provide regularly scheduled service. The resulting time savings will be important to southern Washington County and to industrialists considering location in the County.

Princeton Airport north of Calais with its 4,000-foot runway may become a county airport feeding into Bangor and offering scheduled flights into New Brunswick and Nova Scotia. This facility was constructed during W.W. II and was obtained by the Town of Princeton from the Federal Government, but the Town does not have the resources to maintain or administer it. Its location is north of an ideal location for



a county airport, but this is offset by the relative lack of fog. The Airport is now available (and it is assumed will become better equipped) to handle private flights into the County. As in so many cases local access, as opposed to access from outside the region, is a problem and improvement of access to this airport will be required. This airport is one of the "proposed new airports" in the State Transportation Commission's report. That report stated:

"There are financial problems among the smallest airports where volume of aeronautical and non-aeronautical activity cannot yet carry airport costs. But air service is clearly an essential key to expanding local activity. A recent study estimated that eight out of ten new industrial plants are being located today in the smaller towns. High on the list of requirements of the modern plant site location is efficiency of communications. An adequate airport to serve all types of private aircraft and at least medium sized sub-sonic jets should be provided where at all possible." The County should support the efforts of the Commission in this regard.

The Transportation Commission's 1967 report recommended initiation of direct Bangor-New Brunswick flights. It is possible that an improved Princeton-Calais Airport would be a stop on these flights.

Machias Airport's 2,000 foot air strip is also available for private

flights but is subject to more fog and is precluded by topography from major expansion. In 1968 this facility received \$16,000 in Federal matching funds. It was one of only four in Maine. Eastport has a 2,900 foot paved airstrip and Lubec a 2,000 foot sod airstrip.

Machias, Princeton, and Eastport's Airports can act as feeders to Bangor. Charter flight seaplanes will continue to make flights into the "great woods" and "bordering forest" sporting camps, providing quick access to them.

It is concluded that the development of Princeton's Airport and of that in Machias will have only secondary effects upon the new express highway. They make the area more attractive to industry through executive and charter express flights and eventual scheduled flights, but these do not, and will not, affect traffic volumes on area highways to any appreciable extent. The traffic to the new industries attracted to the area in part by the airports will increase traffic volumes. However, no specific assignment has been made on the basis of the airports alone.

Inasmuch as all of the highway alternates considered terminate at Calais, all would serve the Airport equally. The southern alternate would, however, provide most direct access from Machias and other County population centers along existing Route 1.

C. Bus

Washington County's only regularly scheduled public transportation link with Bangor or New Brunswick is Eastern Greyhound. There are two buses east and two west every day: they arrive at Machias Eastbound at 10:55 a.m. and 11:35 p.m. and Westbound at 1:05 a.m. and 11:35 am. All are New York City-St. Stephen runs that stop in Harrington, Columbia Falls, Jonesboro, Machias, Whiting, Perry and Calais. All of these stations but Jonesboro accept express as well as passengers.

Bus transportation would certainly be benefited by improved highways. The southern alternate is closer to the communities served by bus and thus construction of the express highway on this alternate would most greatly benefit bus transportation.

D. Seaports

The Maine State Transportation Commission's 1967 report to the Governor succinctly sums up the history of Maine's water transportation:

'Thirty to forty years ago coastal freight and passenger services in Maine were used extensively, considering the amount of traffic available at that time. During the late 1930's, the share

of the total traffic of the State carried by water started to decline and at the inception of World War II all coastal and intercoastal steamers having been pressed into the war effort, this type of transportation fell to almost zero. Following World War II, dry cargo, coastal and intercoastal shipping never returned to Maine in any volume and in a few years after the War, 90 percent of dry cargo coastal and intercoastal shipping had vanished from all ports. Even though this shipping did not return to Maine, the economy of the State did not seem to suffer, other than for those directly connected with the waterfront. The freight moved via rail and by truck over the highway system. Passengers moved via rail until recent years and then took to air transportation, private automobile and buses."

The Maine Port Authority stated in its application for an Economic Development Administration Technical Assistance Grant:

"A comprehensive assessment of industry requirements for ocean shipping facilities is needed before intelligent plans for both short-range and long-range port facility development can be made. There are indications, for instance, that growth in Maine's pulp and paper industry may necessitate general cargo facilities far in excess of present capabilities. Current and predicted development in mineral activity will probably result in the need

for specialized port facilities. And trends within the shipping industry itself toward larger cargo vessels of all kinds and greatly increased use of containerization in cargo handling suggest the need for different types of port facilities in Maine."

If the Authority is able to obtain financing for this comprehensive study its findings would enhance economic development potential of Washington County.

The principal port serving all of Maine is Portland. The trend is, and has been for many years, toward fewer and fewer ports. "Intermodal" shipping in which airplanes and trucks bring goods to one port at which a ship is loaded and distribute goods from one port at which the ship is unloaded is gaining in popularity. This could mean a lessening of the importance of Maine's other ports. However, this is true only of general shipping. In specific cases growth can be expected. Examples are ferry service and deep-draft oil tankers.

An important water facility in Maine is its ferry service, which has a profound effect on the economy of the islands being served. The ferries operated by the Maine State Ferry Service under the jurisdiction of the Maine Port Authority do not serve Washington County.

The Canadian Department of Trade and Industry in a recently completed study (A. D. Marginson and Associates, Ltd., "Study of Terminal



Locations for a Second Nova Scotia-New England Ferry Service") has concluded that the need exists for an additional 180-car ferry to supplement the 135-car "Blue-Nose". The study favors a ferry route from Welshpool on Campobello Island to Digby, north of Yarmouth, Nova Scotia. This route would be all-Canadian and therefore not present customs problems as would the two other new routes considered (to Jonesport and to Eastport). This route would mean that all vehicles using the ferry would have to travel the length of Washington County. Two day trips for automobiles are contemplated and possible, one night trip for trucks. During peak days this would amount to as many as 540 vehicles. These vehicles would find the expressway alternate nearest the coast or the central alternate the most convenient. These vehicles would, of course, also generate need for food, fuel and shelter.

Another ferry proposal is that supported by Gloucester, Massachusetts for direct ferry service from that city to Nova Scotia. This would have exactly the opposite affect upon the County of the Welshpool to Digby route. It is felt that the Welshpool-Digby route, because of the considerably shorter overall time involved, is the more likely of the two to be implemented.

Starboard Island, in Machias Bay in the Town of Machiasport, has 80 feet at mean low water right adjacent to it. A short distance off the Island the depth is 130 feet or more. (The Boston Inner Harbor will

not accommodate ships with a draft greater than 40 feet.) This is the reason that this site is being considered for the construction of a \$75-150 million dollar oil refinery processing foreign crude brought in 300,000-plus ton tankers such as the new S. S. Universe Ireland and its five sister ships being built in Japan. These ships will have a draft of 79 feet and carry 2,400,000 barrels of oil each voyage.

The Machiasport proposal, which is dependent upon receipt of an import quota by Occidental Petroleum and upon the creation of a duty-free area so that crude oil can be refined here and reshipped without duty, involves construction of a \$3 million pier and the refinery. After refining, the petroleum would either be reshipped or sent inland through pipelines. It is interesting to note the present importance of the petroleum and petroleum products traffic at both Searsport and Portland. At Portland nearly all of it goes into the 236-mile 12, 18 and 24 inch pipelines of the Portland Pipeline Corporation for transportation to Montreal, Canada. During World War II a pipeline from Searsport to Limestone A. F. B. was active.

Operation of the port and refinery may result in approximately 300 new jobs in the County. If this is the case, -- a total of over 500 new jobs could be expected when increases in service and retail employment are considered. In addition, it is reasonable to assume that an additional 200 jobs might be created by petro-chemical industries

locating near the new refinery with another 50 service and retail jobs. The grand total would then be 850 jobs. With an average family size of 3.5 persons per family, these jobs will support almost 3,000 persons.

It should be kept in mind that while these are new jobs, they do not mean all new people -- many of the jobs will be filled by present residents of the County. Access to the area from Machias, Calais and other population centers is thus important.

Five hundred of these new jobs would be on the Machiasport Peninsula; the present road is totally inadequate for this. Widening it would seriously disrupt the community. New access must be provided. The expressway alternate that would most directly and conveniently serve this access road is the southern alternate.

It seems inevitable that Washington County's deep water potential will be developed -- it is a question of timing. If Occidental Petroleum is not successful now, they or another firm will in the not-too-distant future construct a similar facility, and it will need improved access.

The City of Eastport has recently completed construction of a new public pier 410 feet into the harbor which has 21 feet m.l.w. alongside and with the assistance of a \$150,000 grant from the Washington County Development Authority, has constructed a breakway to protect the pier. Eastport is the only port in Washington County listed by the Maine Port

Authority in its Port of Maine publications. There is a possibility that in the future shipping of specific products (potatoes which now go to Searsport, foreign petroleum) will occur. Although the specific affect upon the various alternate expressway locations is difficult to project, it favors the southern or central alternate.

Other County port proposals being investigated by the Maine Port Authority include the dredging of the Machias River for pleasure craft, and the use of coast-wise barges. It is not anticipated that these would have great effect upon the highways.

Outside of Washington County, Searsport is the only developed port north of Portland and thus, while Bar Harbor, Bangor, and Bucksport are listed Port Authority Ports and are closer to Washington County, it is logical to assume that County shipments that do not go through Portland will go through Searsport.

The facilities at Searsport include two piers capable of handling dry and bulk cargo:

The Bangor and Aroostook Railroad Pier is approximately 800 feet long by 100 feet wide and has four warehouses. The four warehouses have a total capacity of 11,795 tons with 36,400 square feet of storage capacity.

Three railroad tracks run the full length of the pier so that

cargo may be transferred directly between boats and railroad cars or between a warehouse and railroad cars as well as between ships and a warehouse. The pier is floodlighted to permit night work.

C. H. Sprague & Son Company Pier is 614 feet long and has a berth on the east side 850 feet in length. The Pier is equipped to handle dry bulk cargo from each of 3 movable towers. Cargo can be loaded directly into open-top railroad cars and trucks or put into ground storage.

The central or southern alternates provide better access from Washington County to Searsport than the northern.



## 10. VISUAL AND AESTHETIC EFFECTS OF A NEW HIGHWAY

None of the alternate routes is inherently "more aesthetic" than any other. As is discussed in the section on Recreation and Tourist Activities, a motorist on the southerly alternate, while closer to the ocean would have but few opportunities to see it without leaving the expressway.

None of the alternate routes will have an adverse visual or aesthetic effect, per se. The Maine State Highway Commission has proven its ability to design highways that enhance the areas through which they pass. Maine stands among the leaders in the nation in this respect.

Not too many years ago, it was felt that the cost of highway beautification could not be afforded, but today it is realized that at the same time that we build in beauty, we also, in many instances, build in safety.

There are many measures that individually or collectively can affect considerable aesthetic improvements. These include separating roadways by wide landscaped malls or by providing grade separations between the two roadways; providing wide sweeping curves; designing bridges individually instead of from common design criteria; providing parking and rest areas with scenic views; locating highways so that they have a view of landmarks and other attractive but not overly

distracting vistas; and improving the quality, type and spacing of directional signing.

The concept of wide separating malls or grade separation, aside from being aesthetically pleasing, is a very tangible safety factor. Properly utilized, this measure can virtually eliminate head-on collisions. The scenic beauty of a well designed and landscaped wide center mall contributes greatly to the reduction of driver fatigue -- one of the big causes of highway accidents.

Long, graceful curves, designed to blend into the landscape, provide the driver with an interesting panorama ahead of him instead of endless miles of pavement. Recognizable landmarks give the driver a feeling that he is making progress on his trip. Views of landmarks can be provided by bringing the route of a highway within a close distance of the landmark. (In many instances, all that is required is some additional clearing of adjacent land to provide a view of a town or a valley.)

Rest areas and scenic-view parking areas, if properly designed, will be used by many motorists to break up a long trip. Here again, an aesthetic consideration promotes safety by helping to fight driver fatigue.

## 11. SUMMARY AND CONCLUSIONS

The traffic capacity of existing Routes 1 and 9 is not a problem except in the urban and congested areas. Speed is a problem on Route 1 because of urban congestion; on Route 9 because of low standards resulting from lack of demand. Safety is not a problem, but may become a problem with increased speed, volume, and mix of traffic and land use.

Considering the Route 9 alternate, a modern two-lane highway with control of access would provide almost equivalent service to an expressway for traffic volumes in the foreseeable future. Average speed would be increased from the present 46 m. p. h. to about 55 m. p. h. , resulting in an overall saving of about 30 minutes over the present trip, at a cost of about 26 million dollars.

Traffic service along Route 1 is already quite good however, by-passes of urban centers will be required to provide appreciable improvement. Some of the urban centers will require improvement whether or not an express highway is constructed.

Traffic volumes in some segments of the Route 1 corridor will require 4-lane expressways in the future, regardless of other developments. Nearly all of the present population is located along the Route 1 corridor and a Route 1 expressway (the

southern alternate) would serve these residents in addition to handling through traffic. A Route 9 expressway (the northern alternate) would not serve the population concentrations, and the central alternate would not serve them as well as the southern.

If a Route 1 expressway is built (the southern alternate) there will be problems of timing, scheduling and design. Particular attention should be given to the effect each segment will have on the local community as well as the safety aspects of traffic switching between 4-lane divided and two-lane undivided roadways in the interim years.

Estimated Construction Costs of the various alternates are presented below:

Northern Route	\$116,099,663
Central Route	\$125,609,079
Southern Route (Alternate B)	\$173,365,568
Southern Route, Tunk Mtn. (Alternate A) including Ellsworth Spur	\$174,063,822
Improvements to Route 9	\$ 26,614,200
Improvements to Route 1	\$ 36,280,150

The savings to users might finance \$30,000,000 worth of expressway. Assuming conventional financing, it would require an investment of \$4,000,000 dollars or more in order to return \$1,000,000 annually -- a net loss of \$3,000,000. It is highly unlikely that all of the user savings could be transferred to the residents of the corridor since most of the savings accrue to people traveling through rather than staying in the corridor.

The analysis of social and economic forces in the area indicates that overall population declines, due to extreme levels of out-migration among young persons under 30 years of age, have taken place in the area as a whole, but not in all sub-areas. Calais has experienced recent growth and the Machias area has been able to maintain population levels. The analysis also indicates that retailing and manufacturing employment is concentrated in the coastal communities and has shown recent gains in both the Calais and Machias areas. Thus, while many parts of the area sustain near-depression levels of living, there is growth potential in some of the coastal sub-areas.

If highway improvements are to stimulate and foster economic growth they must be located in that portion of the Study Area where there is potential for economic growth. This is in the coastal areas and most significantly on the Calais-Machias axis.

In terms of developing an express highway through the entire County, then, the southern alternate would be most appropriate from a socio-economic point of view.

In considering the effect of an express highway upon tourism, recreation, wildlife and historic areas, it was found that the nature and extent of recreation resources and facilities in the vicinity of Route 9, do not alone, justify development of Route 9 beyond its present state.

If tourism along the coast of Washington County is to be developed beyond its present state, then Route 1, an improved Route 1 or the southern alternate express highway will be the logical backbone of that effort. The recreational value of Route 1 is and will, however, be directly proportional to the development of feeder roads and tourist facilities along the coastline. From a recreational standpoint, improvement of Route 1 could only be justified if there are serious plans to develop this area for tourism.

Of the highway locations under consideration, recreation in the area would be least affected, positively or negatively, by the central alternate. Such a road would stimulate recreation only insofar as it would facilitate casual and sporadic building of access roads into the surrounding area.



For the motorist to visit the historic sites in Washington County requires, in most cases, a special "side-trip" from existing routes. This would also be true of an express highway whichever of the alternates is selected. The southern alternate does, however, pass closest to these sites.

A study of the effects of a new express highway upon other components of the overall transportation system revealed that construction of an express highway into and through Washington County will make rail shipment less attractive, whichever alternate is selected, and will divert tonnage from it. Rail passenger service has been totally discontinued and there is no reason to expect that it will be re-introduced. Bus transportation would certainly be benefited by improved highways. The central and southern alternates are closer to the population centers and the communities served by bus and thus construction of the express highway on one of these alternates would most greatly benefit bus transportation.

The development of Princeton's Airport into a major County facility and continued development of the Machias Airport would have only secondary effects upon a new express highway. They will make the area more attractive to industry through executive and charter-express flights and eventual scheduled flights, but

these will not affect traffic volumes on area highways to any appreciable extent. The traffic to the new industries attracted to the area in part by the airports will increase traffic volumes. However, no specific assignment can be made on the basis of the airports alone. Inasmuch as all of the highway alternates considered terminate at Calais, all would serve the Princeton Airport equally. The southern alternate would, however, provide most direct access from Machias and other County population centers along existing Route 1 to Calais.

The ferries operated by the Maine State Ferry Service under the jurisdiction of the Maine Port Authority do not serve Washington County. However, the Canadian Department of Trade and Industry recently completed a study favoring a new ferry route from Welshpool on Campobello Island to Digby north of Yarmouth, Nova Scotia. All vehicles from outside Washington County using the ferry would have to travel the length of the County. These vehicles would find the southern or central expressway alternate most convenient.

The central or southern alternates provide better access from Washington County to Searsport and other ports, including the proposed World Port at Machiasport, than does the northern.

The visual and aesthetic impact study concludes that no one

of the alternate routes is inherently "more aesthetic" than any other; a motorist on the southerly alternate, while closer to the ocean would have but few opportunities to see it without leaving the expressway. The study further concluded none of the alternate routes will have an adverse visual or aesthetic effect, per se.