LEGISLATIVE STUDY
STATE ROUTE 20
INTERSTATE 5 TO
SEDRO WOOLLEY

SKAGIT COUNTY

JUNE 1978

PREPARED FOR THE LEGISLATIVE TRANSPORTATION COMMITTEE
1977 Legislature

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION

STATE OF WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF TRANSPORTATION

Highway Administration Building, Olympia, Washington 98504 206/753-6005

Senator Al Henry, Chairman
Senate Transportation & Utilities Committee
Second Floor, House Office Building
Olympia, Washington

Representative Frank "Tub" Hansen, Chairman
House Transportation & Utilities Committee
Second Floor, House Office Building
Olympia, Washington

Gentlemen:

This study has been prepared in response to Section 1 (16), Chapter 235, Laws of 1977, First Extraordinary Session of the Washington State Legislature.

The Legislation required that this study determine the need for realignment of State Route 20 between Sedro Woolley and State Route 5. The Legislation further directed the study to include route selection and cost analysis of various alternatives.

The study does demonstrate that State Route 20 should be realigned between Sedro Woolley and SR 5. Existing accident rates are at the State average for similar type highways, and traffic volumes are projected to grow beyond the present capacity of the highway to accommodate them. The study shows that improvements could be made to the existing highway, although these improvements would result in substantial disruption to the community, while not significantly reducing the accident rates, or improving local community circulation.

In the study six alternative corridors are evaluated and their costs estimated. While these evaluations indicate that Route 5, a corridor passing south of both Sedro Woolley and Burlington, would be the most desirable corridor for a new highway alignment, it must be recognized that the funds and time allocated for this study did not permit a complete interdisciplinary study of the social, environmental and economic impacts of each corridor, including community involvement. The indications of this study must, therefore, be conditional, subject to further consideration of the results of future studies. However, we recommend that no further studies be initiated until it is reasonably assured that construction funds will be available.

The most serious detriment to early construction of a new highway alignment between Sedro Woolley and SR 5 is the availability of funding. As explained in the study, a project of this type would be funded as a Category C project. This project follows many other important projects throughout the State in competition for available funds.

The Department of Transportation will be pleased to brief the Committee on all aspects of this study, provide information at any hearings which may be scheduled by the Committee, and to assist in any way that you may desire.

very truly yours,

WILLIAM A. BULLEY
Secretary of Transportation

LEGISLATIVE STUDY

STATE ROUTE 20

INTERSTATE 5 TO SEDRO WOOLLEY

SKAGIT COUNTY

June 1978

CONTENTS

FIGURES

TABLES

BEGIN PHOTO TOUR

1

2

3

4

5

6

7

8

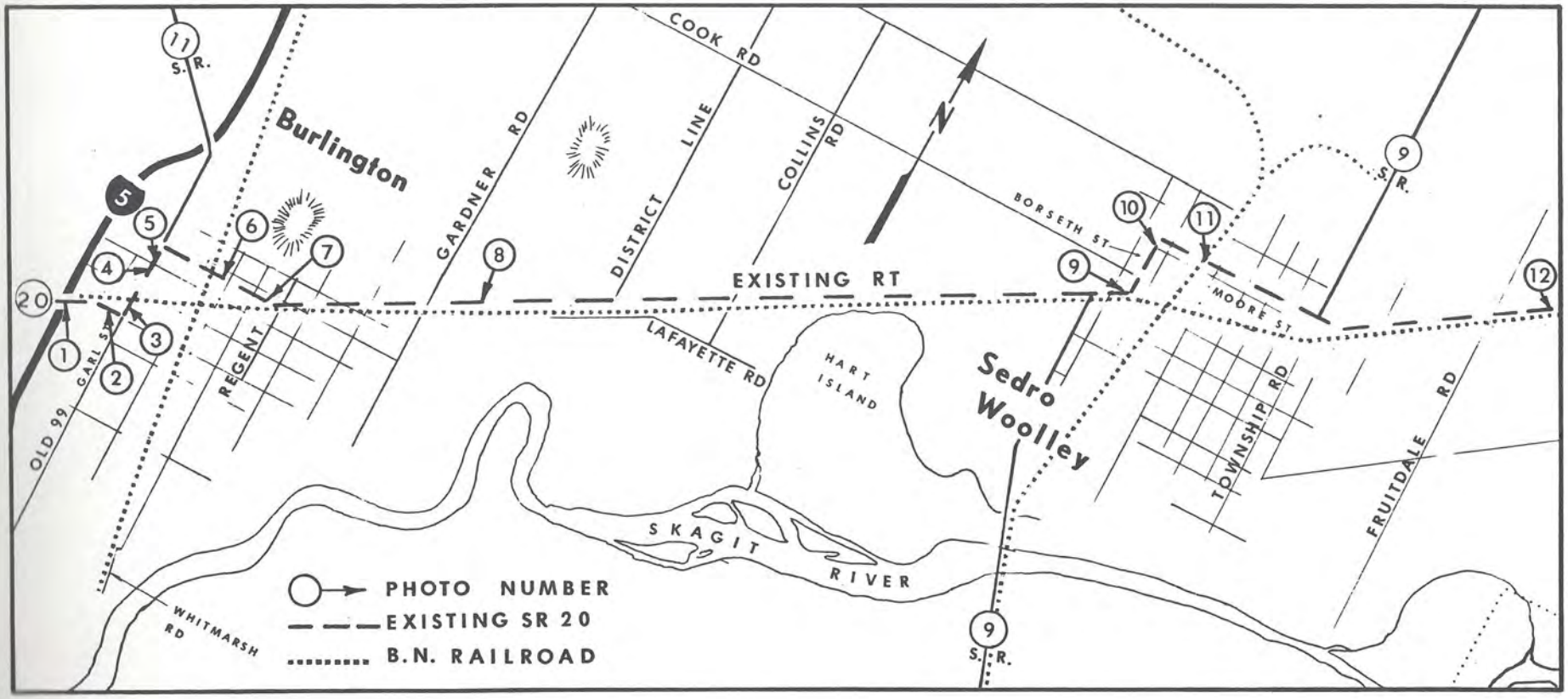
9

END PHOTO TOUR

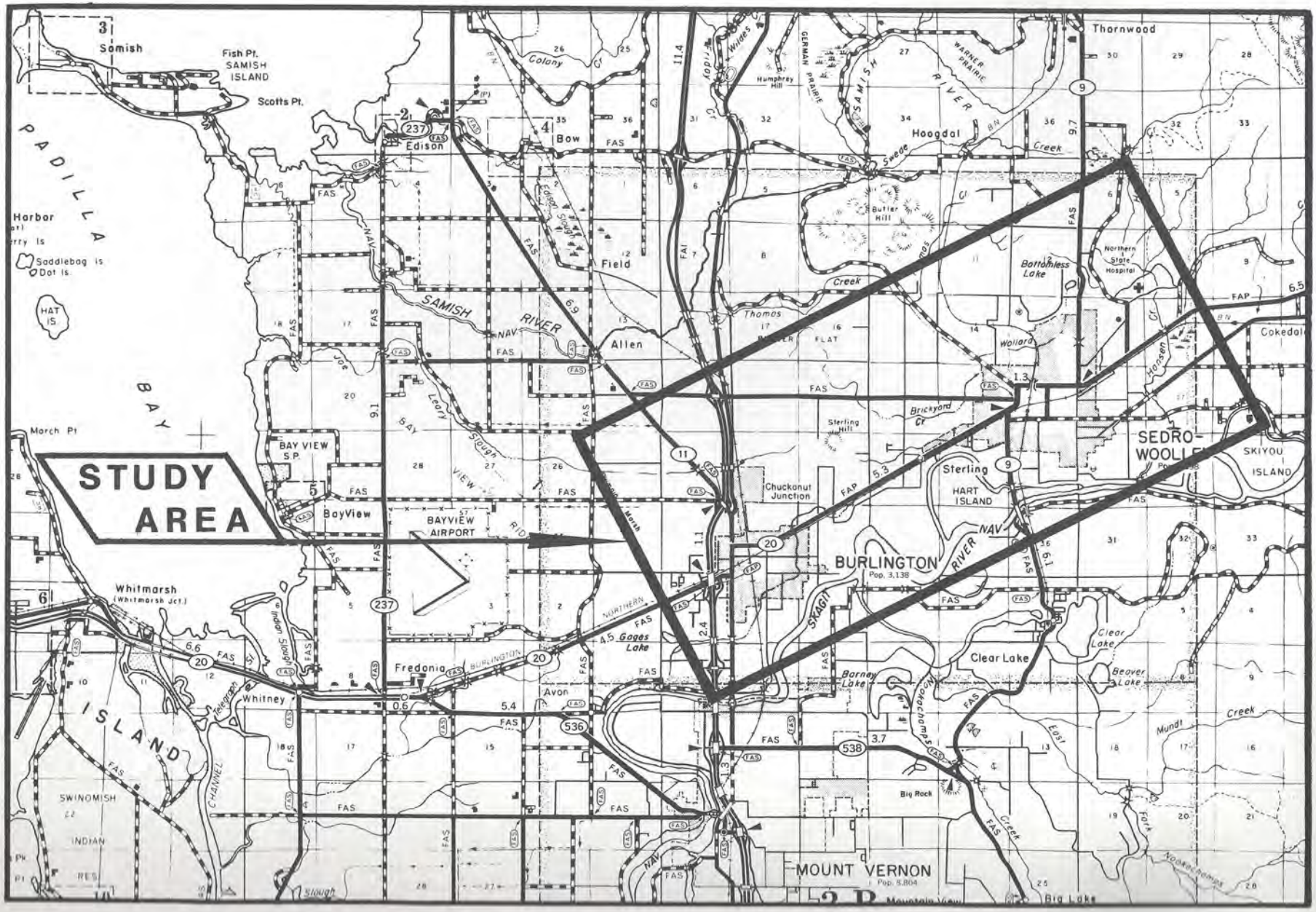
10

11

12




SR 11
SR 20
BURLINGTON
I-5
Skagit


STUDY AREA
Samish
Fish Pt.
SAMISH ISLAND
Scotts Pt.
PADILLA BAY
Harbor
Saddlebag Is
Dot Is.
HAT IS.
March Pt
BAY VIEW S.P.
BayView
BAYVIEW AIRPORT
Whitmarsh
(Whitmarsh Jct.)
Edison
Bow
Field
Allen
Colony Cr
Wiley Cr
Wilges
Humphrey Hill
GERMAN PRAIRIE
WARNER PRAIRIE
SAMISH RIVER
Hoogdal
Swede Creek
Butler Hill
Thornwood
Bottomless Lake
Northern State Hospital
Thomas Creek
Wollard
Cokedal
Hansen Cr
Brickyard Cr
Sterling Hill
Sterling
HART ISLAND
SEDRO-WOOLLEY
SKIYOU ISLAND
Chuckanut Junction
BURLINGTON
Pop. 3,138
SKAGIT RIVER
NAV
Leary Slough
Indian Slough
Telegraph Slough
Fredonia
Whitney
Avon
Gages Lake
Barney Lake
Clear Lake
Beaver Lake
Clear Lake
Mundt Creek
Big Rock
Big Lake
MOUNT VERNON
Pop. 8,804
Mountain View
ISLAND
SWINOMISH INDIAN RES.
CHANNEL
Slough
NORTHERN
BURLINGTON
FAS
FAP
FAI
237
20
536
538
11
9
1.3
2.4
3.7
5.4
6.6
6.9
9.1
9.7
11.4
6.5
5.3
6.1

INTRODUCTION

State Route 20 begins on the Olympic Peninsula at a junction with Highway 101 near Discovery Bay and traverses the northern part of the state via the North Cascades Highway and ends at the Idaho border north of Spokane. Within the area covered in this study it passes through the cities of Burlington and Sedro Woolley. Although past improvements have rerouted the highway to by-pass the central shopping districts of both cities, local and through traffic still intermix to cause severe congestion. The problem is especially acute during the summer when large numbers of tourists use the route. Homes and businesses adjacent to the highway within and between these cities generate a large amount of turning traffic which accounts for the above average accident rate on this section of highway.

The need to study new route alternatives or improvements to the existing route was recognized by the 45th Legislature of the State of Washington. Section 1(16), Chapter 235, 1977 First Extraordinary Session directed the Department of Transportation to determine the need for and evaluate new route alternatives between Interstate 5 and Sedro Woolley. The results of this study are presented in this report along with a brief discussion of the project history and recent developments in the area that might influence route selection.

SUMMARY

This report identifies and evaluates six alternate routes to improve safety and relieve congestion on the existing highway. Route 1 would improve a large portion of the existing route, by-passing only the City of Burlington. Routes 2, 4 and 5 would be entirely on new alignment. Route 3 would be on new alignment except through Sedro Woolley where the existing highway would be improved. Route 6 would be on new alignment except for a short distance between the two cities where the existing highway would be improved. A detailed description and map of each route is contained in the subsection entitled "ROUTE DESCRIPTIONS" in this report. The estimated cost and the social, economic and environmental effects of each route are evaluated and compared in this report. The total estimated cost of each route is shown in Table 1.

TABLE 1

1977 ESTIMATED COSTS
Millions of Dollars

Rt 1	Rt 2	Rt 3	Rt 4	Rt 5	Rt 6
15.0	21.5	14.1	18.5	20.4	25.9

BACKGROUND

REGIONAL DESCRIPTION

The project area includes the cities of Burlington and Sedro Woolley and their outlying areas. Both cities are located in the west central part of Skagit County. Burlington and Sedro Woolley lie in the broad valley of the Skagit River, one of the largest rivers in Washington. The valley is subject to flooding, but floods have been mitigated to some extent, by a series of large hydroelectric dams on the upper Skagit and diking of the lower flood plain around Sedro Woolley, Burlington and Mt. Vernon.

The soil in the valley is excellent for agriculture, which is the basis of the area's economy. Farming, dairying, and food processing are followed by lumber processing and steel fabrication as the area's major industries. Tourism from nearby parks and recreation areas is becoming increasingly important. Sedro Woolley and Burlington are the third and fourth largest cities in the county, with 1970 populations of 4,598 and 3,138, respectively. Both cities are primarily single-family residential communities.

HISTORY OF THE AREA

The Skagit River Delta was first used for agriculture during the 1860's. Farmers built dikes in order to reclaim cropland. Loggers moved up the river, clearing log jams and cutting timber in the valley as they went. The fertile valley around Burlington and Sedro Woolley was settled by farmers, and the towns grew in order to provide the farmers with services. Agriculture, food processing, and logging are still the most important factors in the area's economy. Tourism increased significantly in Sedro Woolley and Burlington in 1972, when the North Cascades Highway was opened. The highway links eastern and western Washington and is a scenic route through the North Cascades National Park.

Skagit County's greatest population growth occurred between 1890 and 1910, when the population doubled. Since 1910 growth has been steady, but moderate. In 1970 the county population was 52,381. The 1977 population was 56,000. The year 2000 population projection is 72,000.

PLANNING HISTORY

In 1963 the Director of Highways authorized a study of possible improvements on State Route 20 between Sedro Woolley and Interstate 5. An Advance Planning Study, considering four route possibilities was published in 1970. These four routes began at Fredonia, some four and ½ miles west of I-5, and ran to the east of Sedro Woolley. Funding has not been available for any further studies or for construction. In 1977 the State Legislature commissioned a Legislative Study updating the 1970 report and changing the limits of routes studied to I-5 eastward. New developments in the area have affected traffic volumes and altered some of the route considerations in the 1970 report. In addition, two new route possibilities have been added to the four that were studied originally.

OTHER DEVELOPMENTS

Skagit Nuclear Power Project

The Puget Sound Power and Light Company is proposing the construction of two nuclear power generating units on a 1500 acre site along State Route 20. The site lies north of the highway approximately 6 miles east-northeast of Sedro Woolley. Construction of the facility is scheduled to begin soon and take approximately ten years to complete. At its peak the project will require 3100 construction workers.

In 1977 an average of 4800 vehicles a day traveled the section of State Route 20 near the site. Puget Power's consultant has estimated that in addition to the normal traffic a minimum of 3300 vehicle trips per day will be using the SR 20 highway in the vicinity of the plant site. Since a major portion of these trips (generated due to the construction) will occur during the commuter peak hours, the forecasted demand will far exceed the capacity of SR 20 unless improvements to the existing highway are made, such as widening and the addition of turning lanes, in the vicinity of the plant access road. Puget Power has agreed to file a traffic reduction plan prior to the beginning of the construction phase in order to mitigate some of the traffic impacts of construction. The actual operation of the facility will require only 150 full time employees.

Since the nuclear plant site lies east of the State Route 20 realignment boundaries, it would not have a direct effect on the selection of any of the alternates. Any realignment of State Route 20 would reduce congestion resulting from the construction or operation of the nuclear power project. However, it is unlikely that the State Route 20 project would be completed prior to the nuclear plant construction peak.

Northern State Hospital

At the time of its closure in 1974, the Northern State Hospital housed 1200 patients. It was run by a staff of 680 employees. Some of the buildings are now being renovated under the direction of the Department of Social and Health Services and will be ready for occupancy by July, 1978. Tentative plans are to use the facility to house the Youth Conservation Corps, a geriatrics center, and a mental health and alcoholism treatment center. Plans are being made for approximately 400 full time residents, few of which will have automobiles. The various programs are expected to employ 390 people. The traffic projections in this study reflect the re-opening of the Northern State building complex.

Food Processing Plants

Food processing is becoming an increasingly important part of Burlington's economy. The larger processing plants in town have joined together to build a pipeline to carry liquid wastes away from the plants. The wastes are too rich in organic nutrients to be passed through the local sewage treatment plant or to be discharged directly into the river. Instead, the wastes are stored temporarily in large storage tanks south of town until they are sprayed onto two nearby fields. The water then evaporates, leaving the nutrients in the soil.

Alternates 2 and 5 would cross these fields, reducing their land area. The Department of Ecology, which strictly regulates the system, requires that each field be a minimum of 50 acres. Some adjustments would have to be made in order for the system to comply with the regulations.

Wild and Scenic Rivers Act of 1968

The Skagit River and some of its tributaries are being considered for possible inclusion in the National Wild and Scenic Rivers System. Congress has not yet acted on a proposal that would classify 58 miles of the Skagit, beginning just east of Sedro Woolley and continuing upstream, as a "recreational" river. Additional upstream sections would be classified "scenic." Dams and other major flood control projects are not permitted within the boundaries of the Wild and Scenic Rivers System. "Recreational" status would allow some other kinds of development and full agricultural use. It would also encourage optimum motor vehicle accessibility. The "scenic" section would be maintained in a more primitive condition. No portion of the river system would be considered "wild", which is the most primitive classification. None of the proposed State Route 20 alternates would conflict with the proposed Wild and Scenic Rivers designation on the Skagit, although alternates 5 and 6 would run within one-quarter mile of the boundary of the "recreational" section. The realignment of State Route 20 would actually enhance the recreational accessibility of the river system.

Flood Control Study

Areas adjacent to the north side of the Skagit River are presently protected from flooding by a system of dikes which, within the study area, extends from Interstate 5 to a point about half way between Burlington and Sedro Woolley. The dikes are old and in need of repair. The Army Corps of Engineers is studying the feasibility of replacing and/or extending the dike system.

Alternates 2, 5 and 6 could be affected by local flood control projects. On the other hand, highway construction could become part of these projects, since the highway could be built as a dike. Building the highway to dike specifications is not considered in the cost estimates of the various alternates, however.

NEED FOR IMPROVEMENTS

TRAFFIC CONGESTION AND ACCIDENT PROBLEMS

Within the study area, existing State Route 20 is two lanes wide, except for Rio Vista Avenue and Garl Street in the City of Burlington, which are four lanes wide. The current traffic volumes and amount of turning traffic result in a level of service of E (at capacity) during peak hours at the major intersections on Garl Street. On the two lane sections of the route, traffic volumes are not considered high, however, with the cross traffic and turning traffic at numerous locations along the route accident rates are high. Accident rates on certain sections of State Route 20 within the study area, between 1971 and 1976, were above the statewide rate for similar routes. Spot locations along the route appear in the "Hazardous Accident Location" listing. This listing indicates all locations on the State system where the accident rate exceeds a calculated critical rate, indicating a need for improvement.

IMPROVEMENTS TO THE EXISTING HIGHWAY CORRIDOR

It is the policy of the Department of Transportation in cooperation with other public and private agencies to promote the efficient use of existing highways and to encourage the reduced use of private automobiles by increasing the number of passengers per vehicle. A wide range of transportation system management (TSM) improvements are possible to improve the efficiency of moving people and goods on the existing highway. These TSM projects are presented in six major categories:

I. Traffic Operation Program to Increase Capacity and Safety (TOPICS - type projects)

II. Preferential or Exclusive Lanes for High Occupancy Vehicles (HOV's) (Buses, Carpools and Vanpools)

III. Ride-Sharing and Promotion Activities

IV. Provisions for fringe area parking (Park and Ride Lots)

V. Pedestrian and Bicycle Facilities

VI. Provisons for Public Transportation

The first category (TOPICS - type) is directed towards improvements to increase the capacity of a roadway. These improvements include reconstruction, widening, pavement markings, channelization, signing, signals and other safety improvements.

In order to improve the existing route using TOPICS-type improvements, it would be necessary to widen Rio Vista Avenue and Garl Street to six lanes. By the year 2000 traffic could then be accommodated, although it would be expected to operate at Level of Service D (congested stop and go traffic). The highway would also require widening

to four lanes to Regent street. It is expected that ever-increasing development along the existing route will cause further traffic conflicts. Construction of these improvements would require the purchase of additional right of way, much of which is already commercially developed. This would be very disruptive to the community.

The remaining five categories are strategies to move more people and goods without increasing vehicular capacity. While these strategies can be very effective in urban areas, the low population densities of rural areas make them impracticable. Burlington and Sedro Woolley traffic is not likely to be strongly influenced by TSM methods to increase vehicle occupancy. The tourist vehicles that use the route already have a high occupancy rate, since whole families and groups tend to travel in single vehicles. A demand for preferential treatment for carpools, vanpools and public transit probably will not exist for many years in the Burlington-Sedro Woolley area.

In conclusion, it does not appear that improvements to the existing highway, using TSM methods, would be practical to satisfy the needs along this corridor.

STATE AND LOCAL INTEREST

State Route 20 is an important cross-state highway and attracts travelers who otherwise may divert to Canada for east-west travel. Therefore it is in the interest of the State to provide a more efficient and safer route through Burlington and Sedro Woolley. The local economy would be expected to improve through increased retail sales if congestion is removed from the downtown areas of the cities involved. Also the cities would be able to develop in a more orderly fashion if through traffic were removed.

DEVELOPMENT OF ALTERNATE PLANS

It is apparent that existing State Route 20 through Burlington and Sedro Woolley is in need of improvement. Since an improvement of the existing route would provide only short-term relief, a study of various route alternatives was initiated in 1963. This action led to completion of a preliminary study in 1966 and an advance planning study in 1970. With more recent developments and concerns of the community it was determined that the 1970 advance planning study should be updated and additional alternatives studied.


EAST
20


TEXACO

ALTERNATE PLANS

ROUTE DESCRIPTIONS

General

Six different routes are being studied as possible improvements to State Route 20 between Interstate 5 near Burlington to Hansen Creek east of Sedro Woolley. All of the routes meet the design criteria for a "minor arterial", which is the functional classification of this portion of SR 20. Wherever any route is on a new alignment, it will be a partially controlled limited access highway. There will be intersections at selected county roads, city streets, and driveway and farm approaches where warranted. Frontage roads will be considered wherever a large number of intersections and driveways might interfere with highway traffic. All of the routes include grade separations at railroad crossings.

Existing Route

The existing route begins at the Interstate 5 - State Route 20 Interchange in Burlington. It winds through downtown Burlington via Rio Vista Avenue, Garl Street, and Avon Avenue to Regent street. From Regent to Borseth Street in Sedro Woolley the existing route parallels the Burlington to Concrete Branch of the Burlington Northern Railroad. In Sedro Woolley the existing route follows Borseth Street and Moore Street to Township Road (SR 9) where it again joins the railroad right of way east of town.

Congestion is the most undesirable aspect of the existing route. Heavy local traffic mixes with through traffic to the detriment of both. Except for the Rio Vista and Garl Street sections, the route is only two lanes wide. There are two at-grade railroad crossings, two traffic signals, and abundant cross streets and driveways. To make a bad situation worse, traffic volumes are expected to double by the year 2000.

Route 1

Route 1 would begin at the Chuckanut Drive (SR 11) Interchange on Interstate 5 just north of Burlington, cross over the Burlington Northern Railroad's Seattle-Vancouver Line, and continue along the south side of Burlington Hill to Regent Street. From Regent Street it would follow the existing route to the end of the project. The highway would be four lanes wide and have a four foot wide median from Interstate 5 to State Route 9. Through Sedro Woolley the highway would have four lanes, but no median. At Township Road it would narrow to two lanes for the rest of the project.

The new alignment would by-pass most of Burlington; avoiding two traffic signals, two right angle turns, and most of the downtown traffic. The residential area on the south side of Burlington Hill would be affected. Some homes would be removed and others would feel the impacts of living near a highway. The effect of the highway on Sedro Woolley would be about the same as it is now. The greatest drawback to widening the existing route is that there are street intersections and driveways all along it, meaning that vehicles will be entering and exiting along

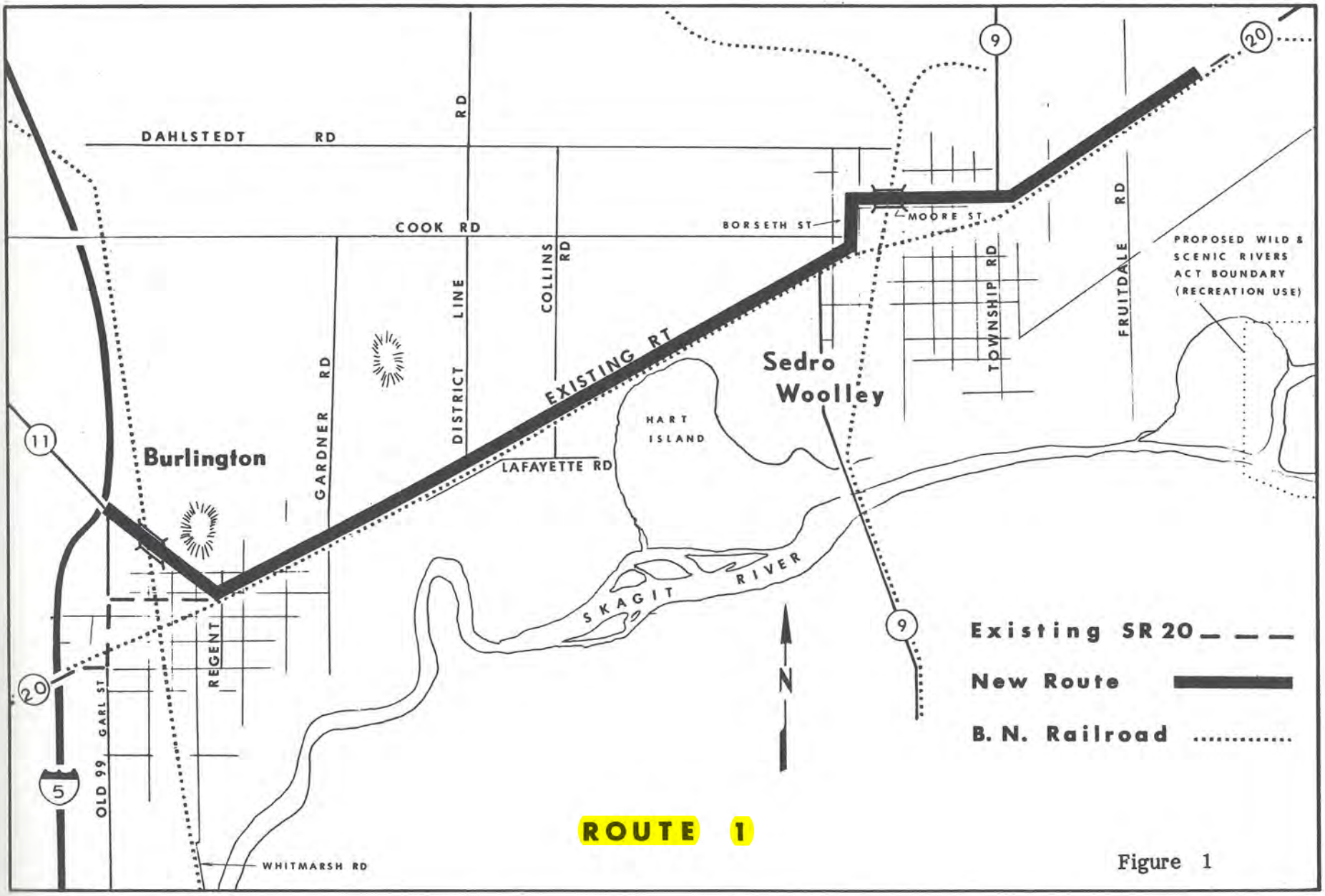

DAHLSTEDT RD
COOK RD
BORSETH ST
MOORE ST
DISTRICT LINE RD
COLLINS RD
GARDNER RD
EXISTING RT
Sedro Woolley
Burlington
HART ISLAND
LAFAYETTE RD
TOWNSHIP RD
FRUITDALE RD
PROPOSED WILD & SCENIC RIVERS ACT BOUNDARY (RECREATION USE)
SKAGIT RIVER
REGENT
GARL ST
OLD 99
WHITMARSH RD
N
Existing SR 20
New Route
B. N. Railroad
ROUTE 1

Figure 1

the entire length of the highway. The accident analysis section demonstrates the hazards of mixing turning vehicles with through traffic.
Virtually all of the property along Route 1 has been developed in one way or another. The choice of this route would leave all of the surrounding farmland intact. Development patterns would not be changed as a result of road construction. The Skagit River and its adjacent flood plain would not be affected.

Route 2

Route 2 would begin at the George Hopper Interchange on Interstate 5 between Mount Vernon and Burlington. It would follow the Skagit River around Burlington, cross the existing route, and by-pass Sedro Woolley to the north. Three overpasses would be built; one where the route crosses Whitmarsh Road and the Burlington Northern Mainline tracks, one over existing State Route 20 and the Burlington Northern Concrete Branch, and one over the Sumas Branch of the Burlington Northern system. There would be a signalized intersection at Riverside Drive (old State Route 99). The new route would be a limited access, four-lane highway with a 40 foot median.

All of Route 2 would follow a new alignment, by-passing both Burlington and Sedro Woolley. The route would separate through and local traffic, relieving congestion through the towns and reducing the hazards to turning traffic on the existing highway.

The new alignment would cut across agricultrual land, reducing the amount of arable land in the valley. A new alignment would also divide some existing fields into smaller, irregularly shaped plots, which would be less efficient to farm. Route 2 passes north of Sedro Woolley, separating the town from potential residential development to the north.

A portion of Route 2 would follow the north bank of the Skagit River. Since new flood control dikes are needed in that area (see "Flood Control" discussion), the highway could be considered as part of a dike system. A joint project of that nature is beyond the scope of this study, however.

Route 2 could easily be extended to the west because the Department of Transportation already owns much of the right of way between the George Hopper Interchange and Fredonia.

Route 3

Route 3 would begin north of Burlington at the Cook Road Interchange on Interstate 5. It would cross the Burlington-Alger Road (Old State Route 99) and the Burlington Northern Railroad on an overpass. Then it would curve north slightly to a point midway between Cook Road and Dahlstedt Road and continue east, intersecting with the existing route at Borseth and Moore Streets. The rest of the route is identical to Route 1. The portion of Route 3 that would be on a new alignment would be four lanes wide with a 40 foot median.

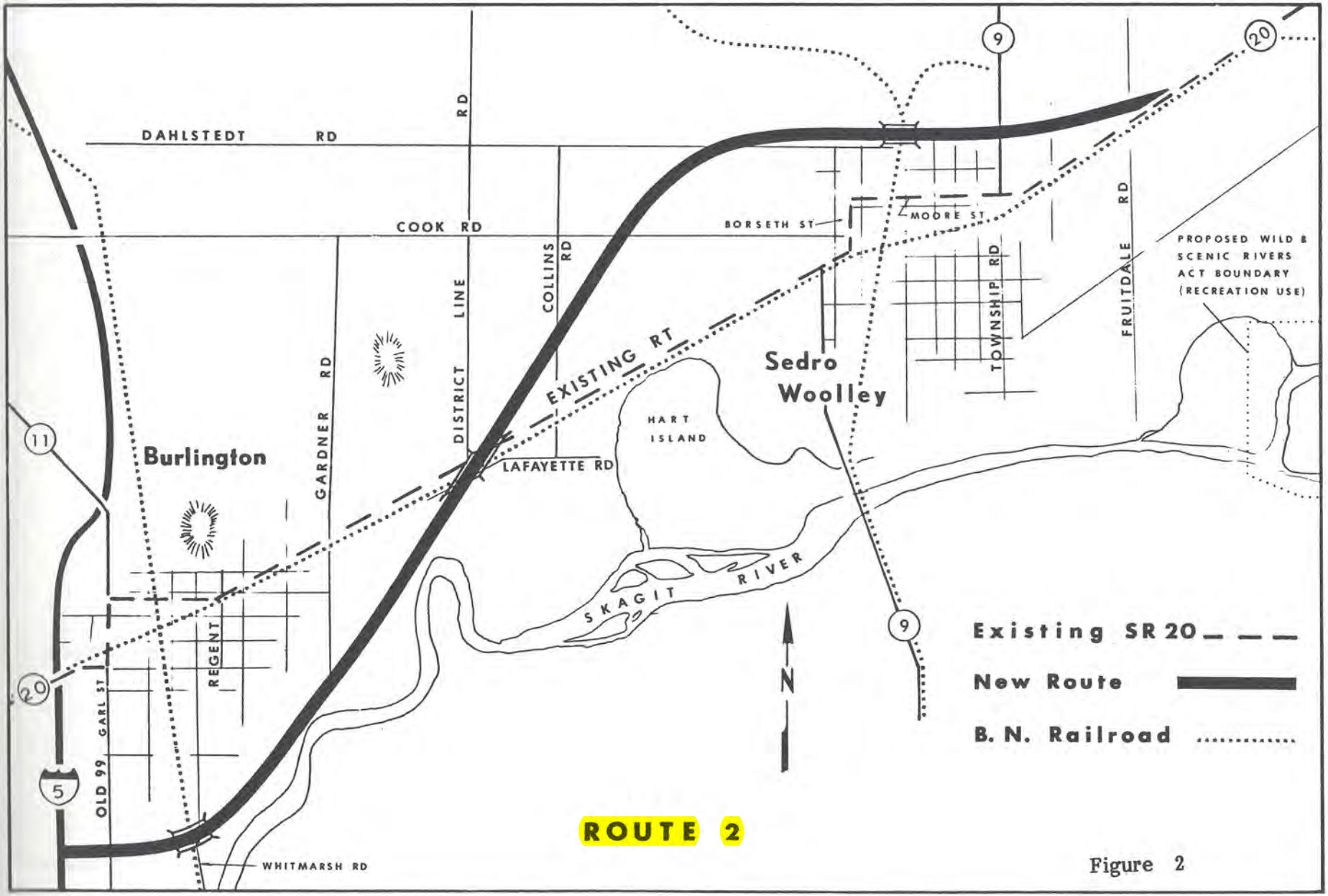

DAHLSTEDT RD
COOK RD
DISTRICT LINE RD
COLLINS RD
BORSETH ST
MOORE ST
TOWNSHIP RD
FRUITDALE RD
PROPOSED WILD & SCENIC RIVERS ACT BOUNDARY (RECREATION USE)
EXISTING RT
Sedro Woolley
Burlington
GARDNER RD
HART ISLAND
LAFAYETTE RD
SKAGIT RIVER
REGENT
OLD 99 GARL ST
WHITMARSH RD
N
Existing SR 20
New Route
B. N. Railroad
ROUTE 2

Figure 2

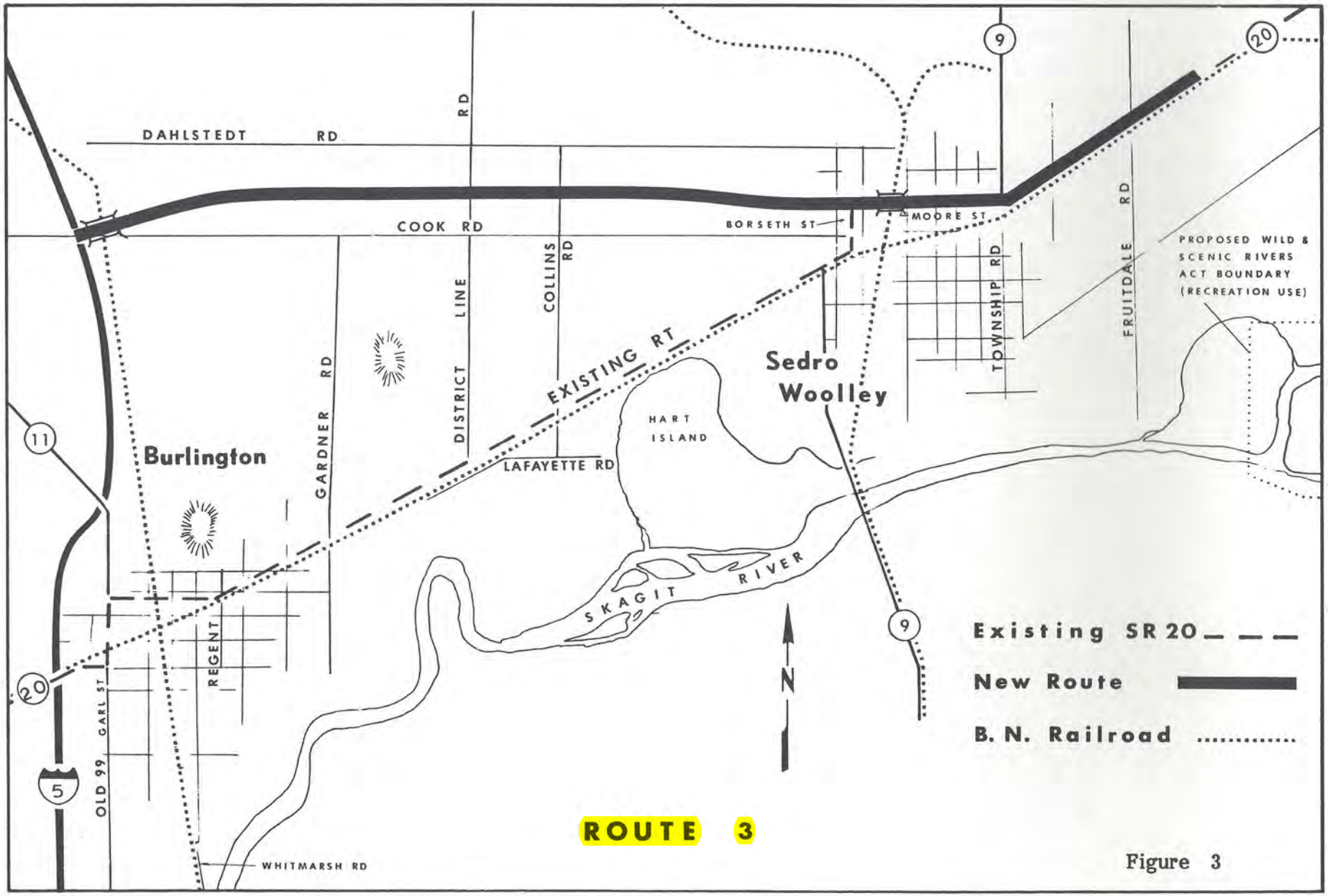

DAHLSTEDT RD
COOK RD
BORSETH ST
MOORE ST
DISTRICT LINE RD
COLLINS RD
GARDNER RD
TOWNSHIP RD
FRUITDALE RD
PROPOSED WILD & SCENIC RIVERS ACT BOUNDARY (RECREATION USE)
EXISTING RT
Sedro Woolley
Burlington
HART ISLAND
LAFAYETTE RD
SKAGIT RIVER
REGENT
GARL ST
OLD 99
WHITMARSH RD
N
Existing SR 20
New Route
B. N. Railroad
ROUTE 3

Figure 3

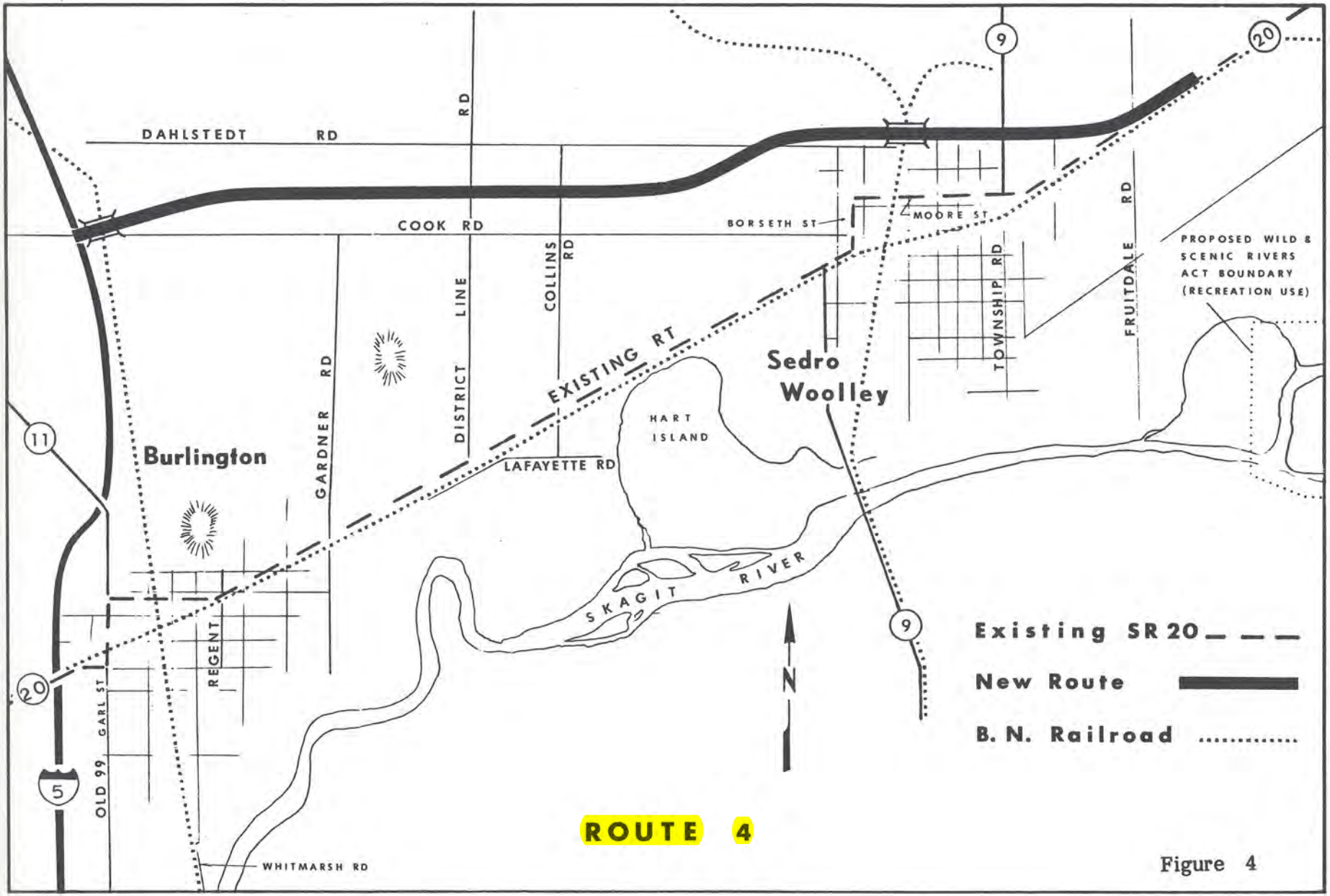

DAHLSTEDT RD
COOK RD
BORSETH ST
MOORE ST
DISTRICT LINE RD
COLLINS RD
GARDNER RD
TOWNSHIP RD
FRUITDALE RD
PROPOSED WILD & SCENIC RIVERS ACT BOUNDARY (RECREATION USE)
EXISTING RT
Sedro Woolley
Burlington
HART ISLAND
LAFAYETTE RD
SKAGIT RIVER
REGENT
GARL ST
OLD 99
WHITMARSH RD
N
Existing SR 20 _ _ _
New Route
B. N. Railroad .....
ROUTE 4

Figure 4

The route would by-pass Burlington and improve the traffic flow through Sedro Woolley. Agricultural land would be taken and existing farms along Cook Road would be bisected by the highway.

Route 4

Route 4 is identical to Route 3 between Interstate 5 and Collins Road, where it curves north and becomes identical to Route 2 to the end of the project. The entire route would be four lanes wide and would have a 40-foot median. It would by-pass both Burlington and Sedro Woolley, but it would cut across agricultural land and separate Sedro Woolley from development north of town.

Route 5

Route 5 would begin at the George Hopper Interchange and follow the Skagit River, by-passing both Burlington and Sedro Woolley to the south. Near Fruitdale Road it would turn north until it meets the existing route at the end of the project. Route 5 is identical to Route 2 from Interstate 5 to the vicinity of Gardner Road. East of Gardner Road the proposed route would cut across a deep bend in the river, requiring a channel change that would straighten the river. The proposal would cross Hart Island and intersect with State Route 9, where a traffic signal would be installed. Since the railroad tracks that run parallel to State Route 9 are expected to be abandoned within a few years, the highway would cross them at grade. West of State Route 9 the highway would be four lanes wide and have a 40 foot median. The rest of the project would be two lanes wide.

Route 5 would by-pass both Burlington and Sedro Woolley, and would be the most direct route from the south between Interstate 5 and the end of the project. It would cross agricultural land and restrict access to the river. It would also pass within one-quarter mile of the proposed Wild and Scenic Rivers recreational boundary.

However, scenic views and public access points could be incorporated into the design. A large recreational lake could be developed by excavating the area inside of the oxbow in the river that will be left as a result of the proposed channel change. The excavated material would be used to construct highway embankments.

The highway could be constructed as a dike to replace the present dike system along the north side of the river. The existing dike is old and weak and is being studied by the U.S. Army Corps of Engineers for possible replacement. To combine the two projects would be more costly than building the highway alone, but probably less than building the two independently. The cost estimates in the report do not include a dike project.

As with Route 2, western extension of the route would be simplified, since the Department of Transportation already owns most of the right of way between the George Hopper Interchange and Fredonia.

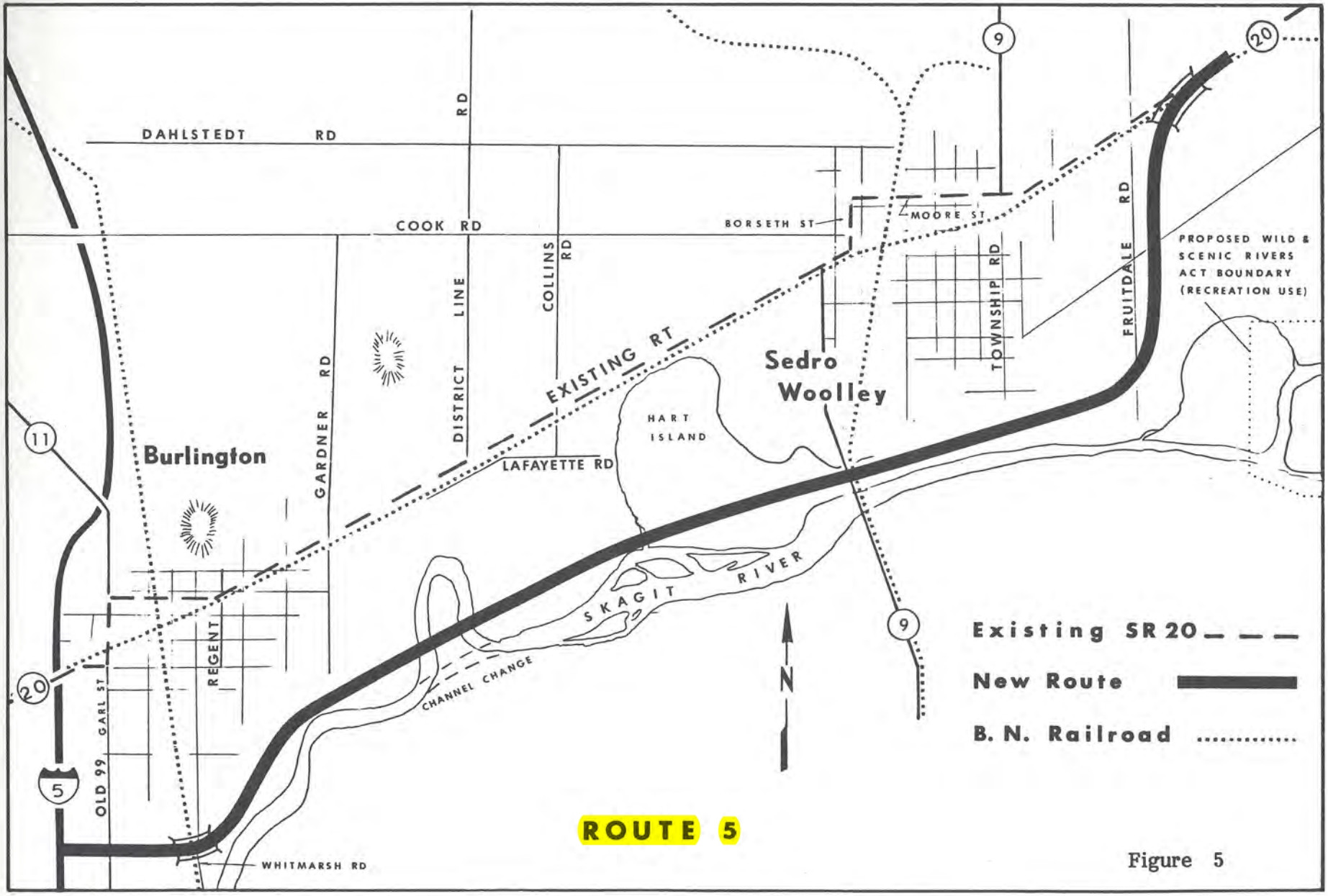

DAHLSTEDT RD
COOK RD
BORSETH ST
MOORE ST
COLLINS RD
DISTRICT LINE
GARDNER RD
EXISTING RT
TOWNSHIP RD
FRUITDALE RD
PROPOSED WILD & SCENIC RIVERS ACT BOUNDARY (RECREATION USE)
Sedro Woolley
Burlington
HART ISLAND
LAFAYETTE RD
REGENT
OLD 99
GARL ST
CHANNEL CHANGE
SKAGIT RIVER
WHITMARSH RD
N
Existing SR 20
New Route
B. N. Railroad
ROUTE 5

Figure 5

Route 6

Route 6 would begin at the Chuckanut Drive Interchange on Interstate 5, cross over the Burlington Northern Railroad tracks, skirt the north side of Burlington Hill, and connect to the existing route in the vicinity of Gardner Road. This section would have four lanes and a 40 foot median. From Gardner Road to District Line Road, Route 6 would follow the existing highway. This section would have to be six lanes wide in order to accommodate merging traffic to and from the existing route and to handle turning traffic. A median barrier would prevent traffic from making left turns, but right turns would be permitted. The new route would overcross westbound traffic on the existing highway near Gardner Road and overcross eastbound traffic on the existing highway and the Burlington Northern Railroad near District Line Road.

From District Line Road the route would continue due east across Hart Island and intersect State Route 9 where it would become identical to Route 5 to the end of project. Between District Line Road and State Route 9 the highway would have four lanes and a 40 foot median. East of State Route 9 it would become a two lane highway.

Route 6 would by-pass Sedro Woolley and most of Burlington. Between Gardner and District Line roads, property would have to be acquired along the north side of the existing route. Much of this property is already developed. The route would cross some farmland and would run along the Skagit River for a short distance.

Table 2
Route Lengths

Existing Route	7.3 Miles
Route 1	7.2 Miles
Route 2	8.7 Miles
Route 3	6.3 Miles
Route 4	6.3 Miles
Route 5	8.4 Miles
Route 6	7.3 Miles

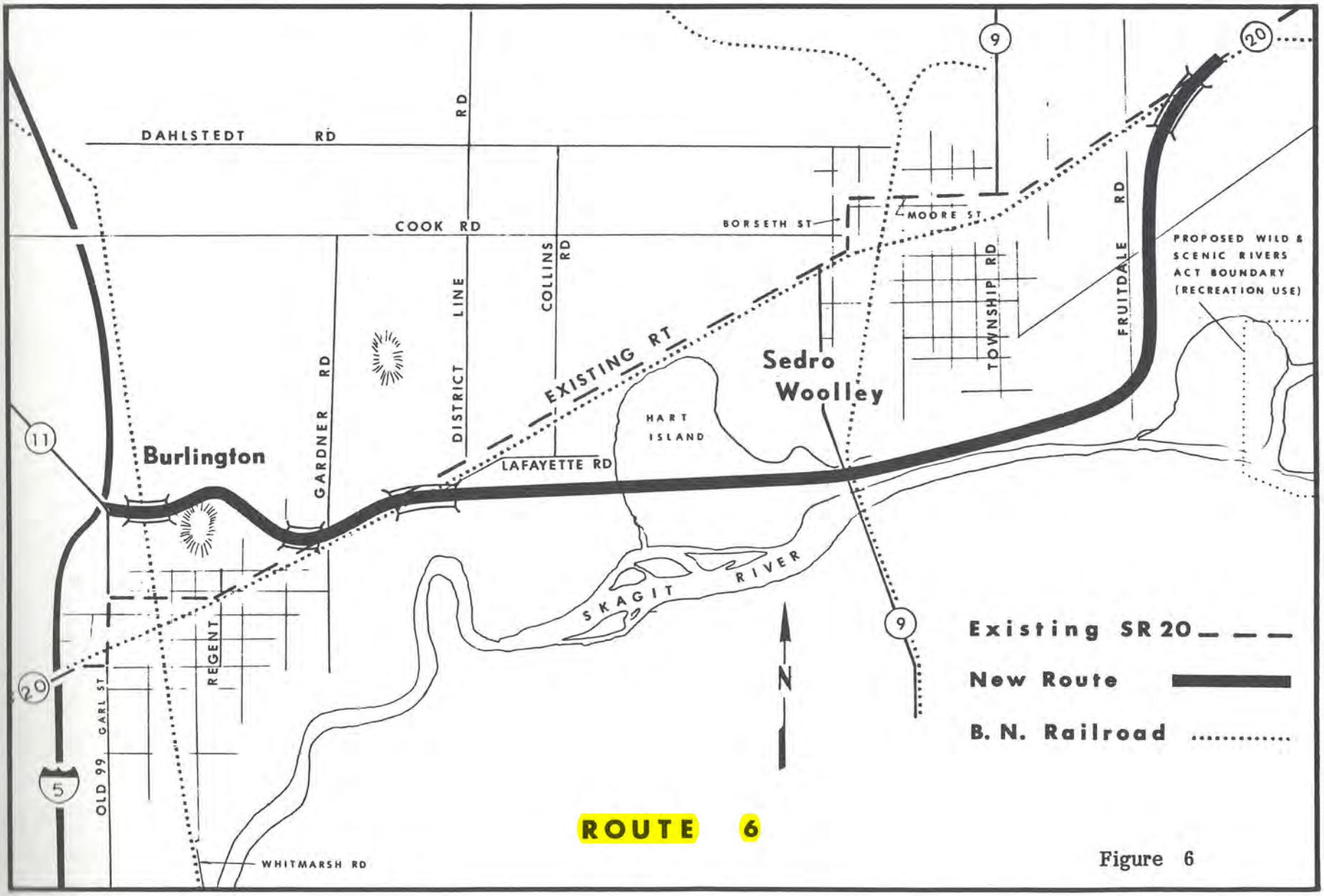
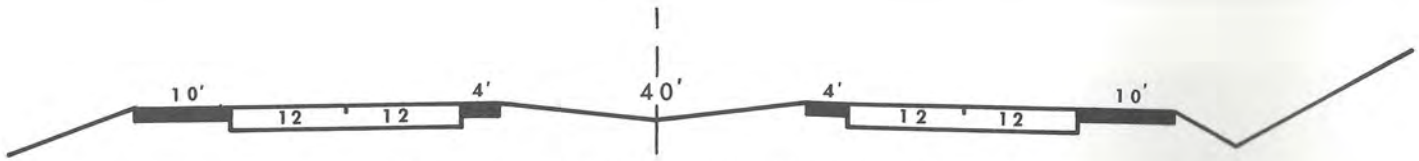
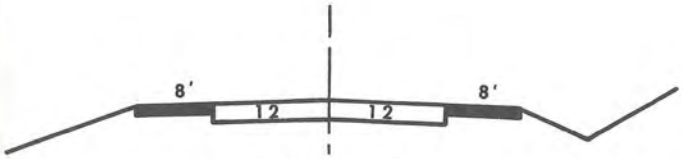

DAHLSTEDT RD
COOK RD
RD
BORSETH ST
MOORE ST
COLLINS RD
DISTRICT LINE
GARDNER RD
EXISTING RT
TOWNSHIP RD
FRUITDALE RD
PROPOSED WILD & SCENIC RIVERS ACT BOUNDARY (RECREATION USE)
Sedro Woolley
HART ISLAND
Burlington
LAFAYETTE RD
SKAGIT RIVER
REGENT
OLD 99
GARL ST
WHITMARSH RD
N
Existing SR 20
New Route
B. N. Railroad
ROUTE 6

Figure 6



FOUR LANE – WIDE MEDIAN

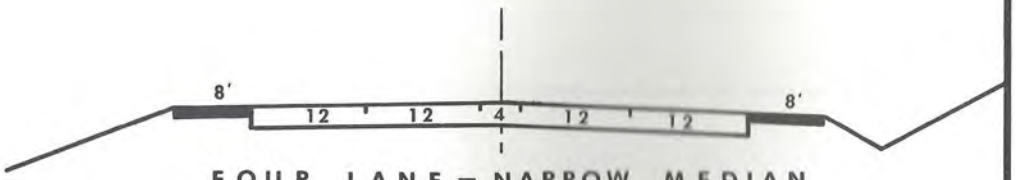
ROUTES 2, 3, 4, 5, & 6



TWO LANE

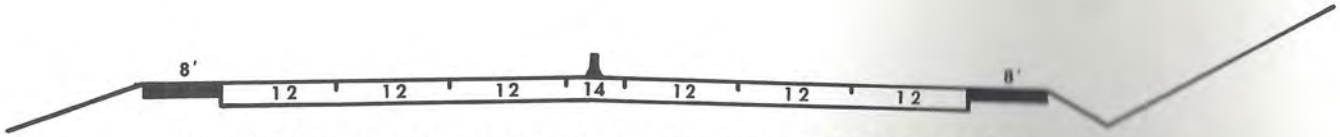
ROUTES 1, 3, 5, & 6

(EAST OF SR 9)



FOUR LANE – NARROW MEDIAN

ROUTE 1



SIX LANE – NARROW MEDIAN WITH MEDIAN BARRIER

ROUTE 6 (GARDNER RD. TO DISTRICT LINE RD.)

TYPICAL ROADWAY SECTIONS

Figure 7

TRAFFIC ANALYSIS

A comprehensive traffic count program was conducted in the area in August 1977. Recording traffic counters were used on most of the arterials in the vicinity of the study and manual turning counts were made at major intersections along the existing route. This data is used in calculating the existing levels of service.

An origin-destination survey was also conducted in August 1977 on the SR 20 corridor. Five interview stations were established in the area and trip data was collected on all trips made past these stations including the trips origin, destination and purpose. Traffic was then projected to the year 2000 taking into consideration the land use, population projections, vehicle registration and historical trends.

Figures 9-14 show the year 2000 estimated daily traffic volumes that can be expected to use the new route alternatives and various other principal roads in the vicinity. The assignments indicate that Route 1 would have a high concentration of traffic on the improved portion of the existing route with a low volume through Burlington, Routes 3 and 4 would result in less traffic than the other new routes with more traffic remaining on the existing highway. Route 5 would result in the least traffic remaining on the existing route between Burlington and Sedro Woolley.

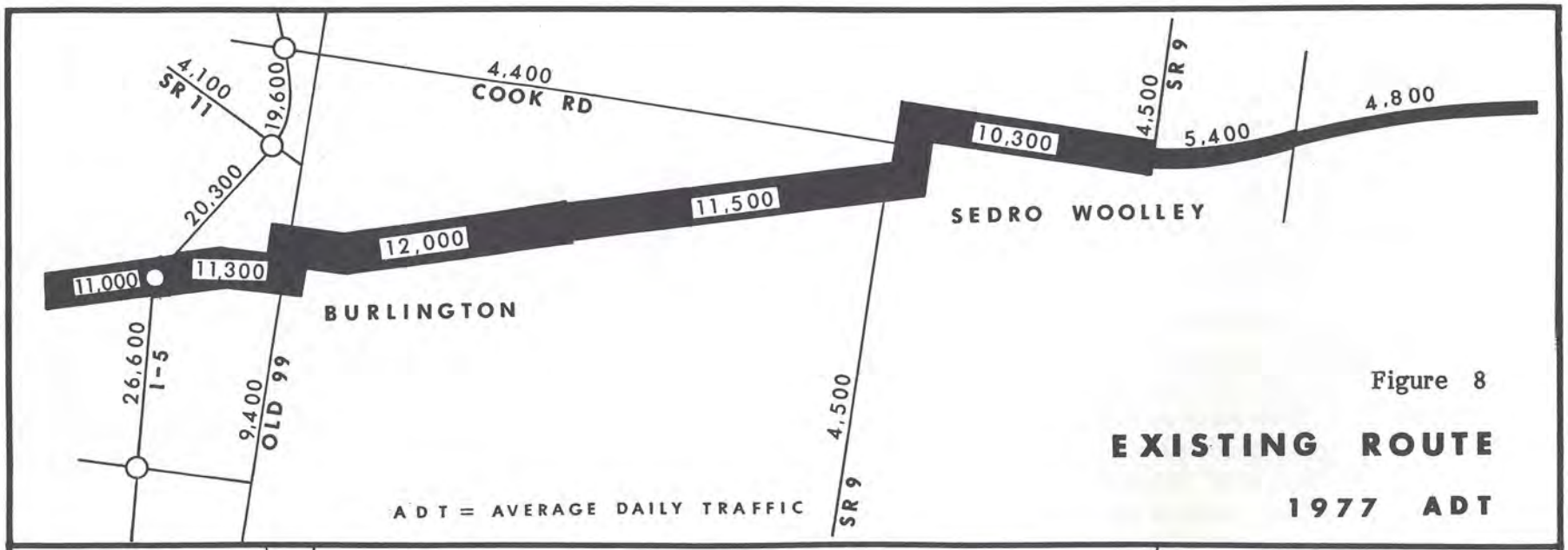


Figure 8

EXISTING ROUTE

1977 ADT

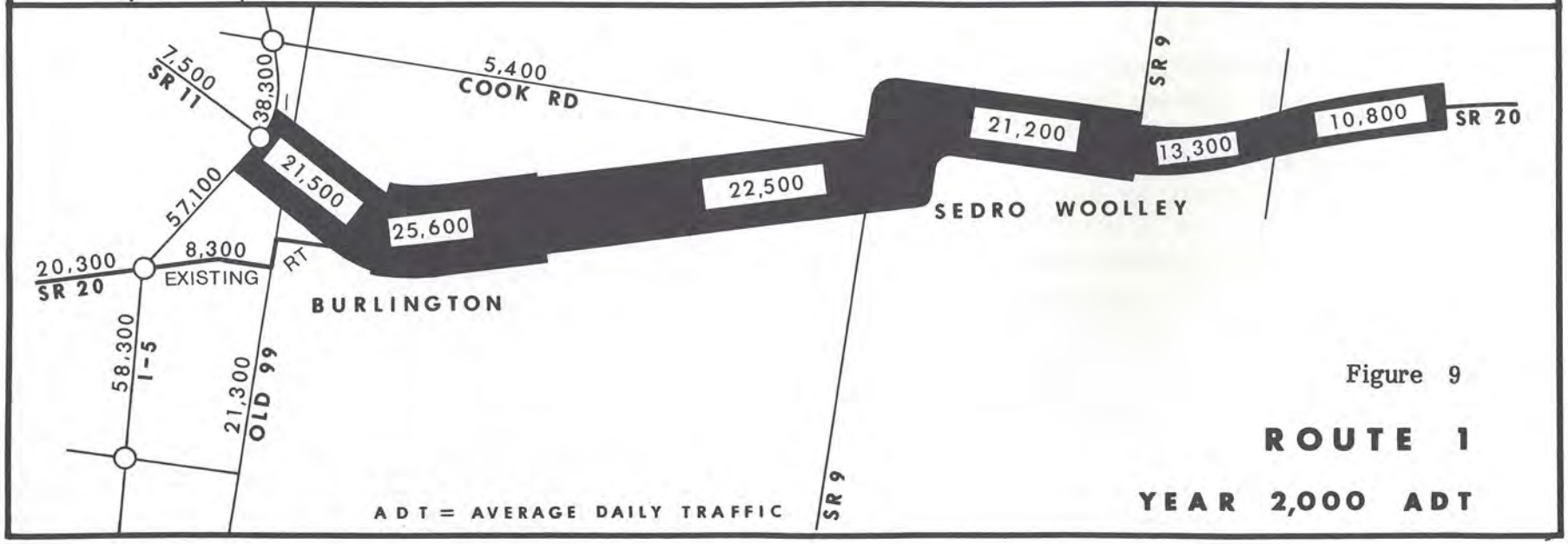


Figure 9

ROUTE 1

YEAR 2,000 ADT

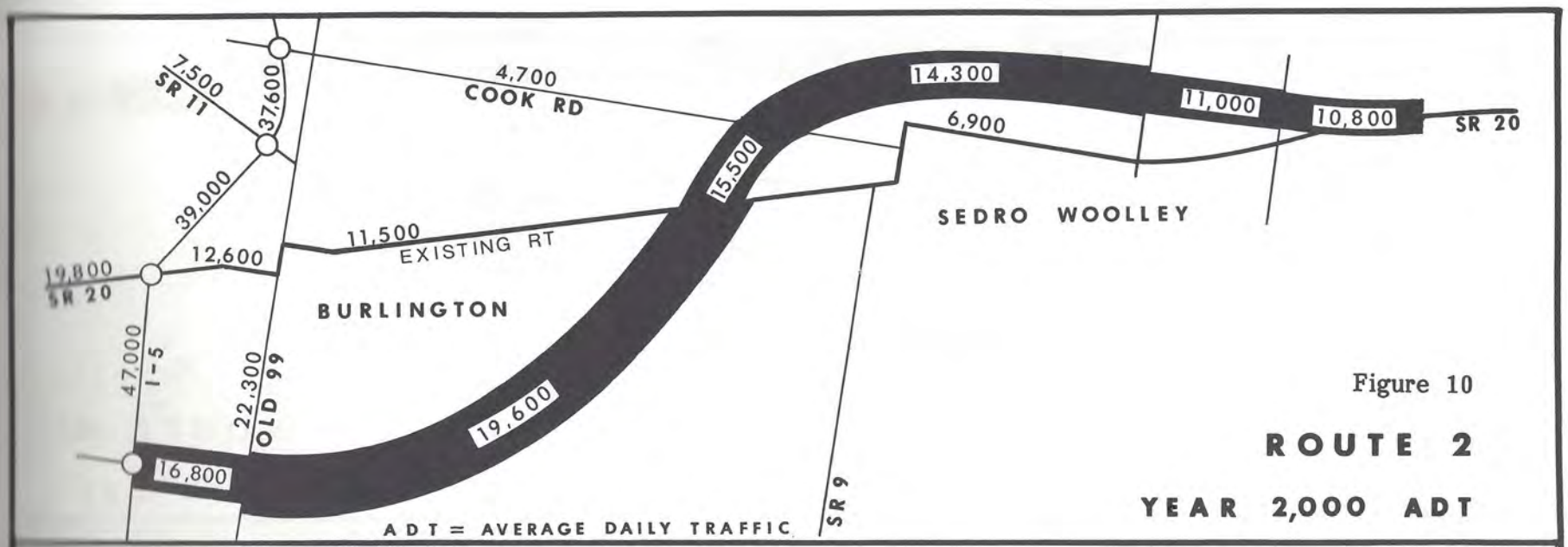


Figure 10

ROUTE 2

YEAR 2,000 ADT

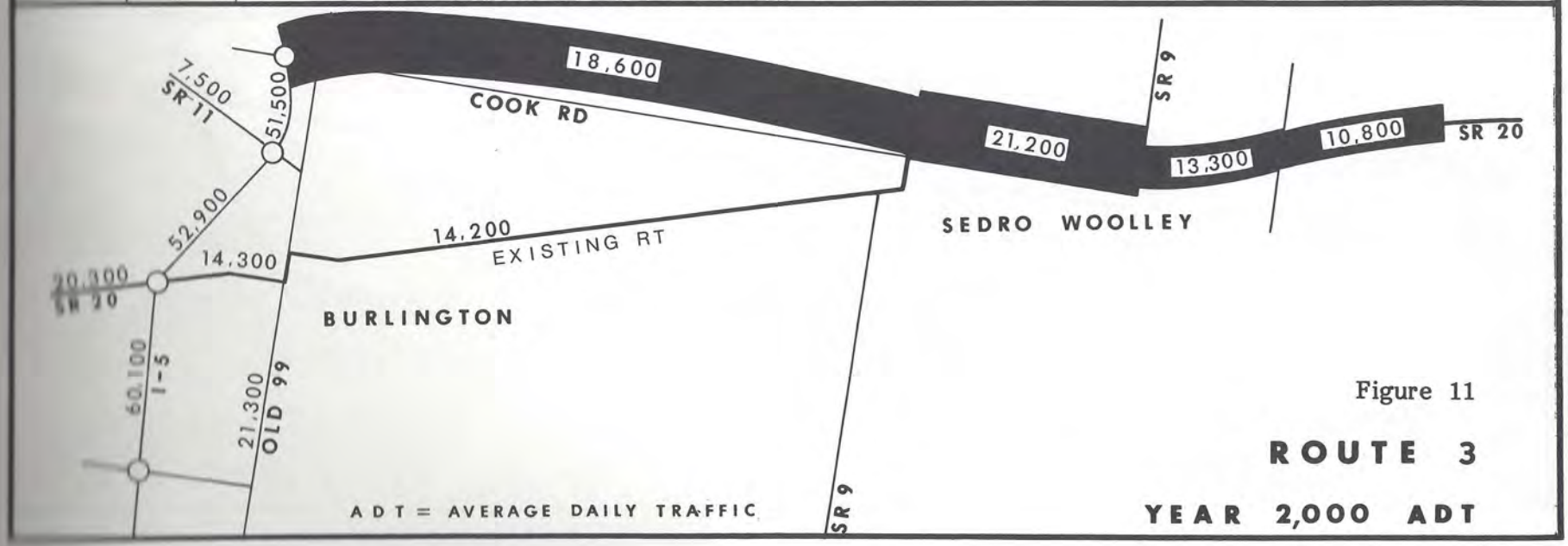


Figure 11

ROUTE 3

YEAR 2,000 ADT

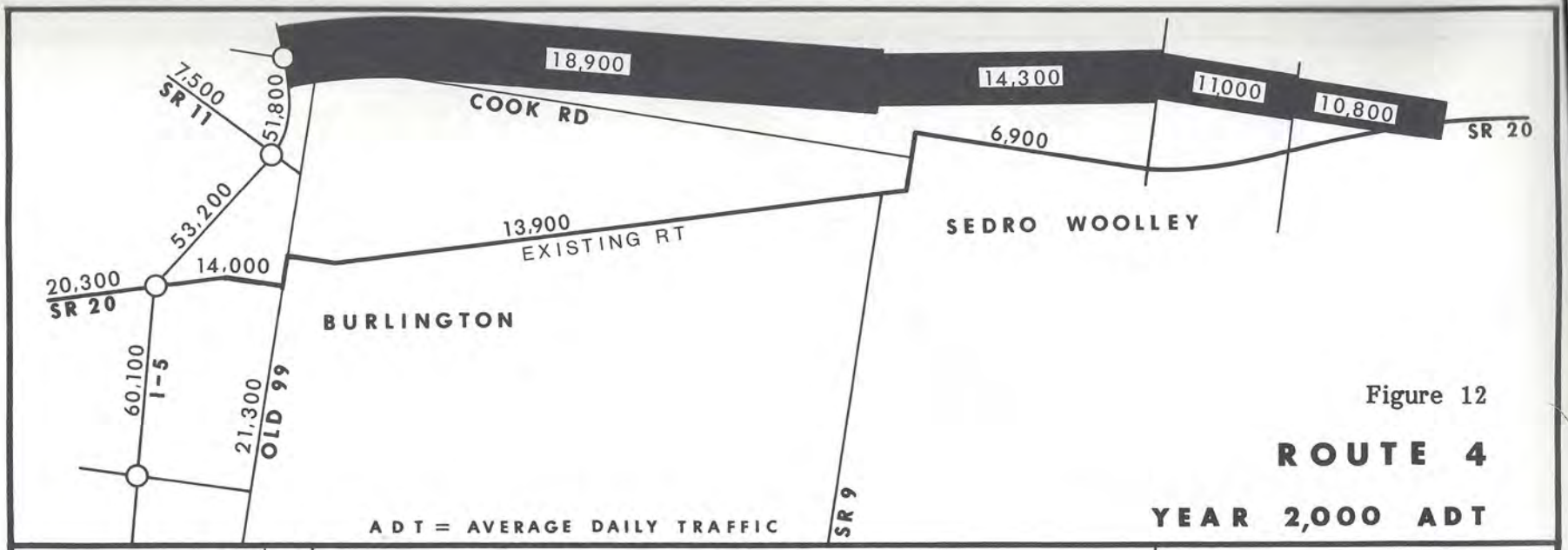


Figure 12

ROUTE 4

YEAR 2,000 ADT

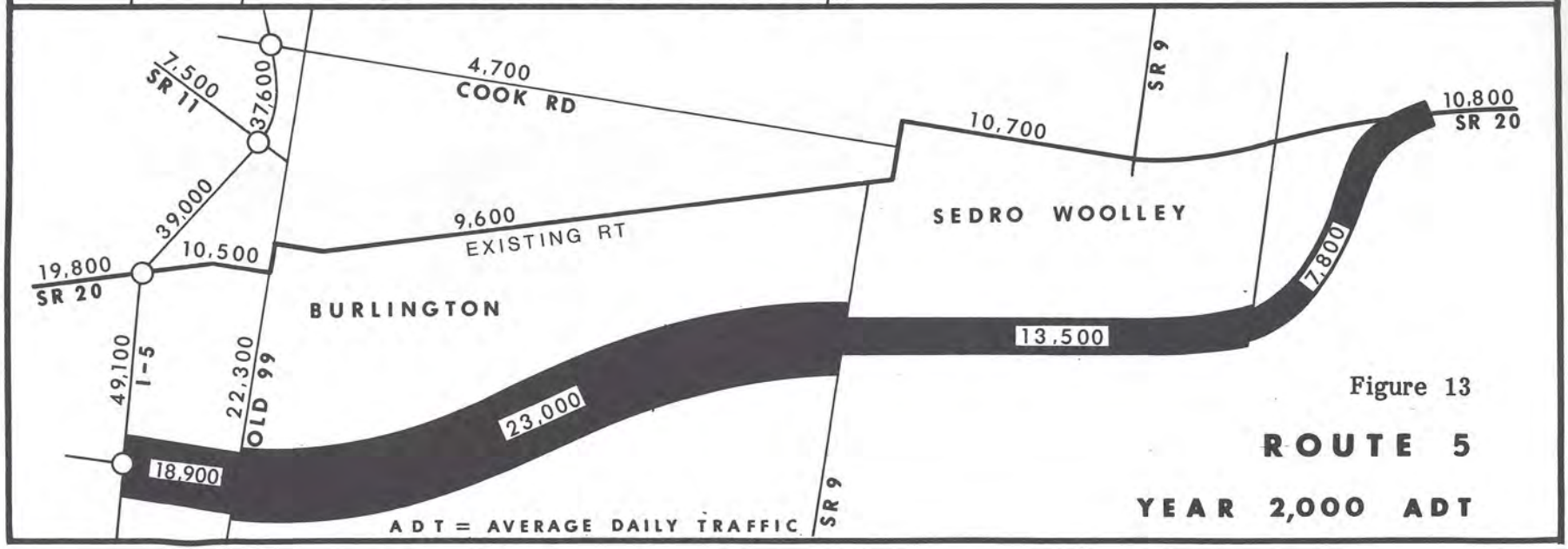


Figure 13

ROUTE 5

YEAR 2,000 ADT

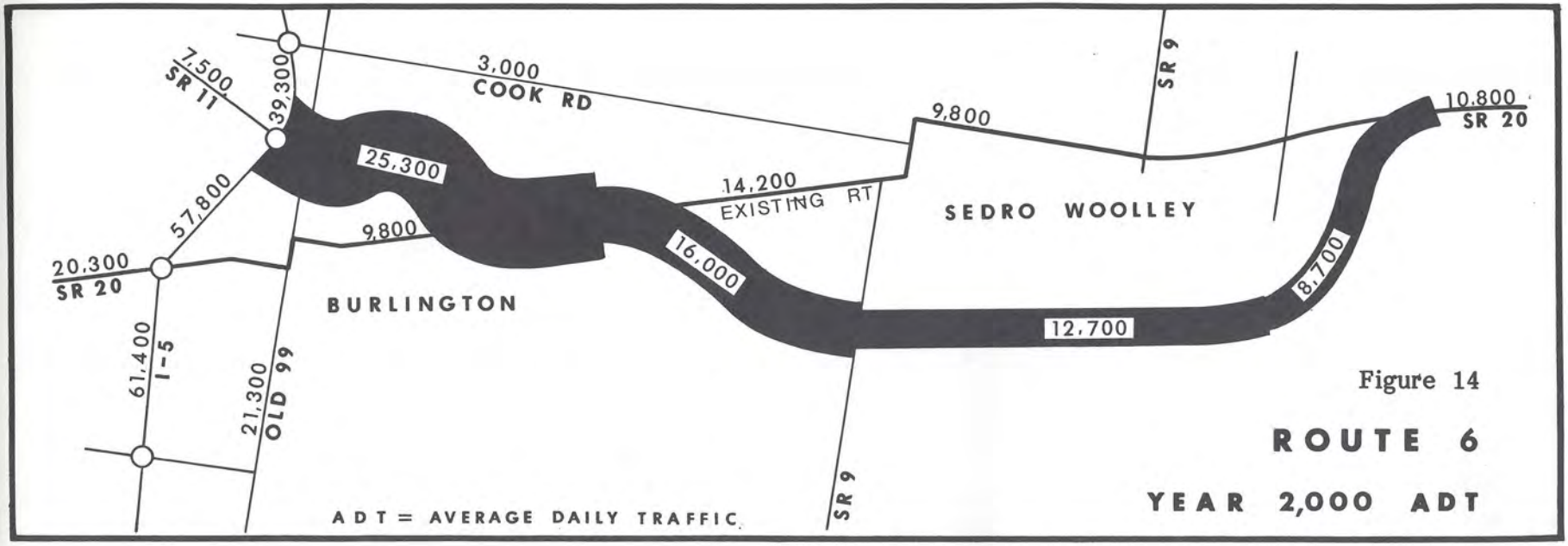


Figure 14

ROUTE 6

YEAR 2,000 ADT

ACCIDENT ANALYSIS

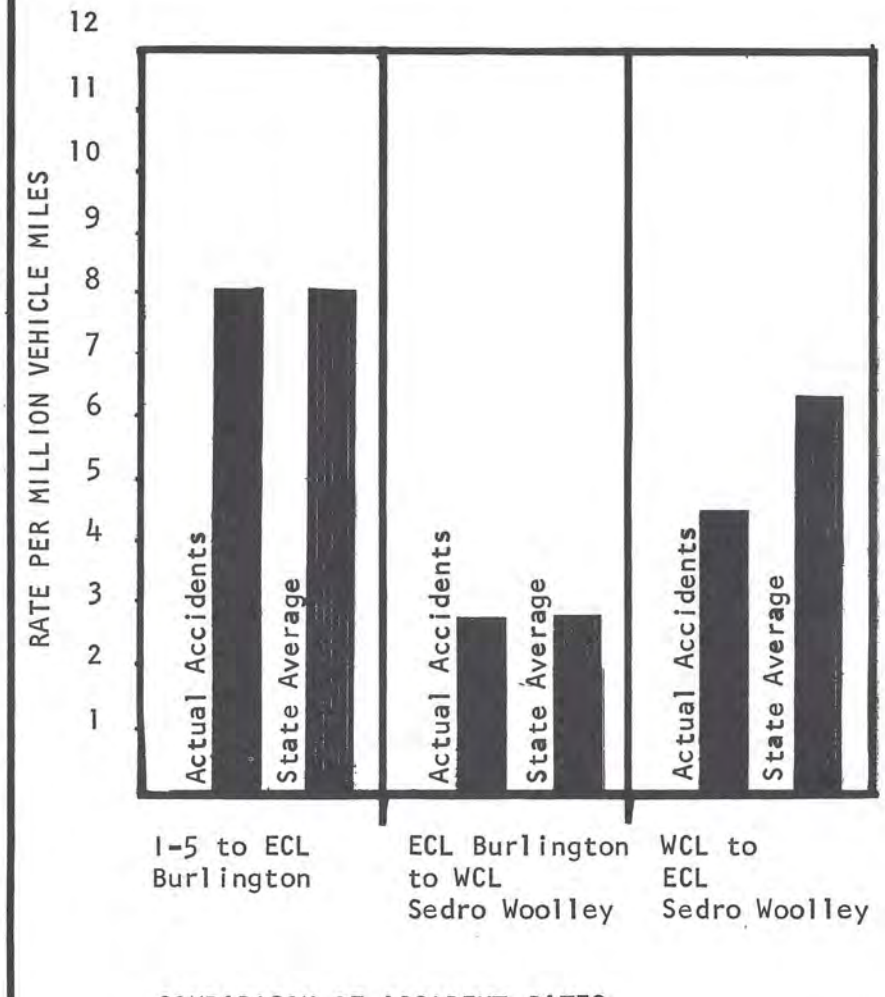
Accidents for the I-5 to Eastern City limits of Sedro Woolley section of SR 20 were compiled by type for 1971 through 1976. A comparison of the actual number of accidents and injuries with the average state wide rates for similar routes is presented in Figures 15 and 16. Similarily, the fatality rate per 100 million vehicle miles is compared in Figure 17. Spot locations within the study area were found to be in the "Hazardous Accident location" listing, indicating need for improvement. Additional congestion resulting from growth in the area will cause these accident rates to increase.

TABLE 3

Accident History 1971 thru 1976

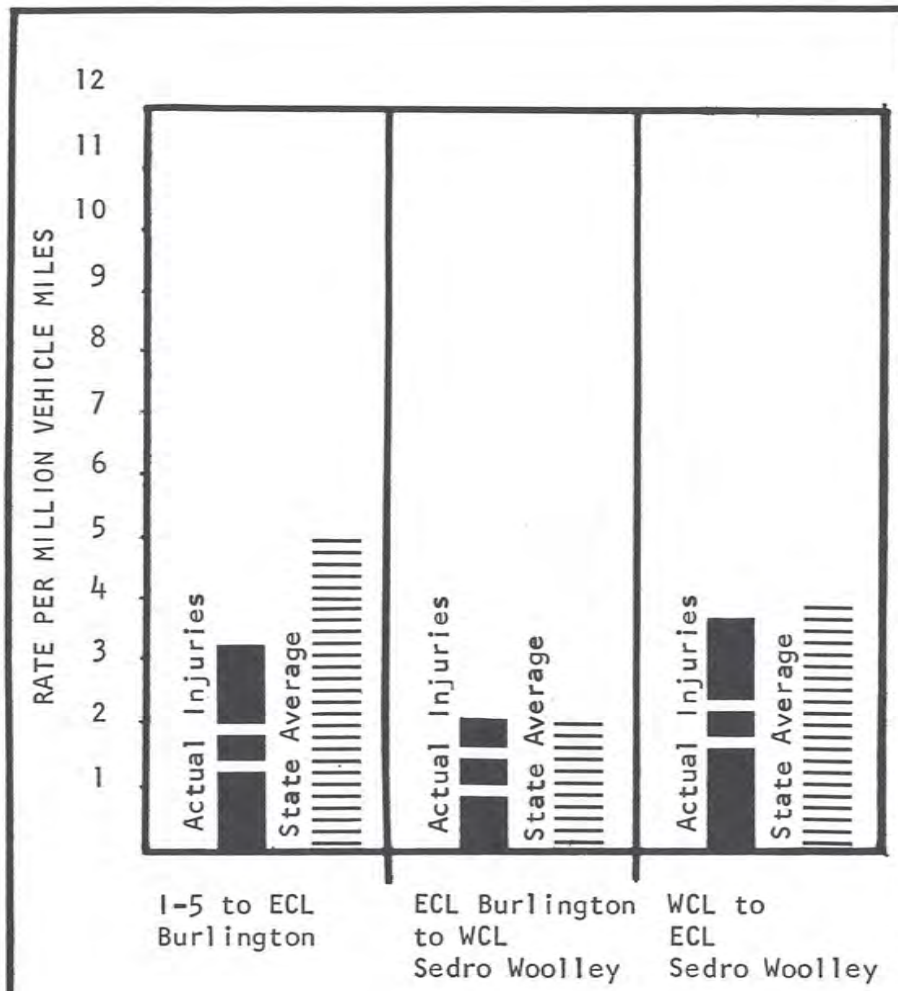
Type of Accident	I-5 to Burlington ECL* (2.00 Mi) Fatalities	Injuries	Accidents	ECL* Burlington to WCL* Sedro Woolley (2.42 Mi) Fatalities	Injuries	Accidents	WCL* Sedro Woolley to ECL (2.56 Mi) Fatalities	Injuries	Accidents	TOTAL ACCIDENTS BY TYPE
Roadside Object	0	10	20	0	14	21	0	28	32	73
Pedestrian-Bicycle	0	12	12	0	2	2	0	1	1	15
Entering Highway	0	15	63	0	12	17	1	28	56	136
Leaving Highway	0	8	26	0	18	24	0	14	9	58
Animal on Roadway	0	1	2	0	1	3	0	0	1	6
Car-Train	0	1	3				0	-	-	3
Rear End	0	40	79	0	53	53	0	48	47	179
Head-on & Sideswipe	0	8	25	0	4	4	1	13	13	42
Turning	0	12	33	0	11	12	0	22	27	72
Striking Parked Car	1	1	5	0	1	0	0	0	4	9
All Others	0	3	14	0	3	10	0	2	7	31
Total Each Section	1	111	281	0	118	146	2	156	197	624
Injuries Per Accident	0.40			0.81			0.79			
Miles Traveled	34.9 MVM			54.8 MVM			43.3 MVM			

* ECL = Eastern City Limits
WCL = Western City Limits



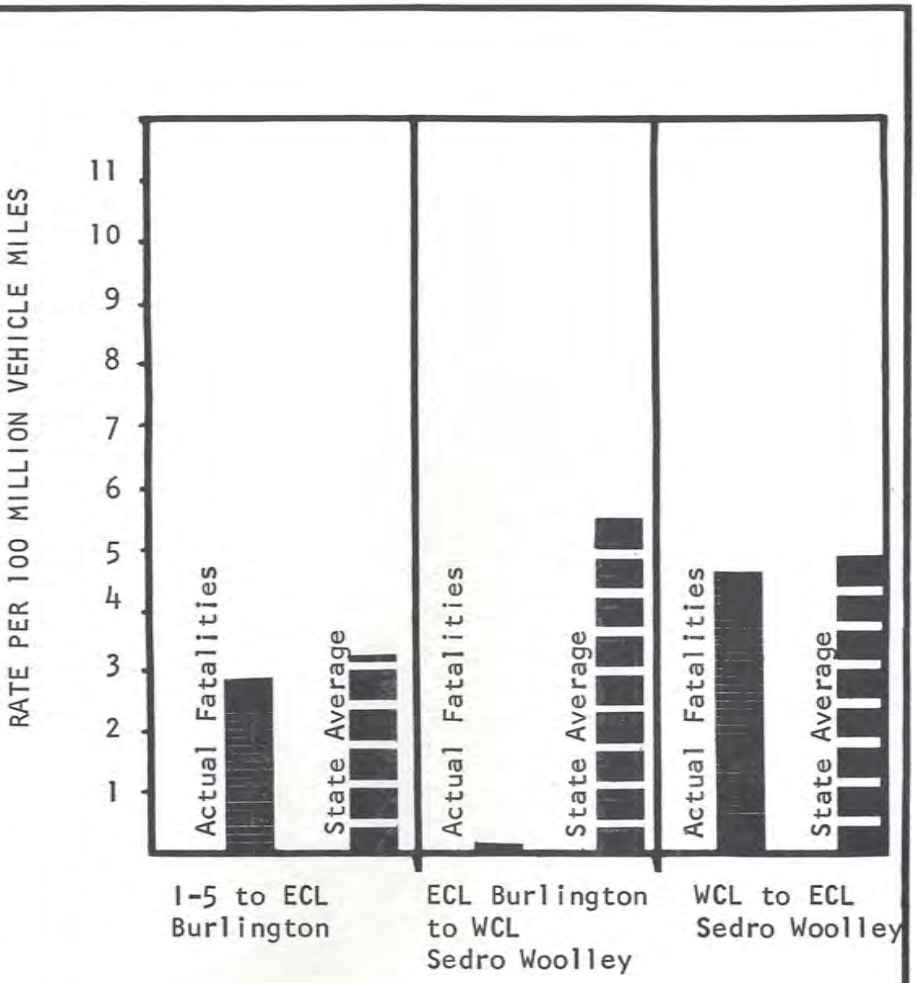
COMPARISON OF ACCIDENT RATES

Figure 15



COMPARISON OF **INJURY RATES**

Figure 16



COMPARISON OF FATALITY RATES

Figure 17

Impact of By-Passes on Retail Sales

Many retailers assume that business activity is directly related to the volume of passing traffic and are apprehensive about by-pass routes which would decrease the amount of local traffic. The assumption is true to a certain extent, but studies have shown that when business districts become congested with traffic, business actually suffers. Shoppers would rather travel greater distances to shop in uncongested areas than to fight traffic downtown.

In 1974 the Federal Highway Administration studied 45 business districts that were by-passed by new highways. Only 6 of the 45 experienced a net loss in retail sales after they were by-passed. Of the 7 studied in the population range of Burlington and Sedro Woolley (3,000-5,000), not one experienced a net loss in retail sales. (See Table 4)

TABLE 4

SUMMARY OF
IMPACT OF BYPASS ROUTES UPON COMMUNITIES' RETAIL SALES

Population	Number of Areas Having Gains in Sales	Number of Areas Having Losses in Sales	Average Decrease in Traffic on Bypassed Route
Less than 1,000	3	2	
1,000 - 3,000	6	1	47%
3,000 - 5,000	7	0	40%
5,000 - 10,000	9	1	30%
10,000 - 25,000	13	2	41%
Over 25,000	1	—	
Total	39	6	

Source: Federal Highway Administration, Social and Economic Effects of Highways, Washington, D.C., U.S. Department of Transportation, 1974, pg. 64.

Retail Sales in Burlington and Sedro Woolley

If a by-pass is built, a net gain in retail sales is predicted, but some highway-oriented businesses would temporarily lose sales. This study assumes that all service stations, restaurants, hotels, and motels are highway oriented, even though some may depend almost exclusively on local patronage. According to this definition approximately 11% of Burlington's retail sales and 9% of Sedro Woolley's are highway-oriented. From Interstate 5 through Sedro Woolley, there are 70 businesses along existing State Route 20, 25 of which are highway-oriented. Half of the highway-oriented businesses are within sight (0.7 miles) of the Interstate 5 - State Route 20 Interchange. A by-pass should have little effect on these businesses because they are strongly influenced by Interstate 5 traffic.

The economic effect of tourism is deomonstrated in Table 5. During the third quarter of 1976 highway-oriented sales increased 3.2% above average in Burlington and 0.9% in Sedro Woolley. The third quarter represents the months of July, August and September, the peak tourist season.

Table 5
Percent of Taxable Retail Sales in
Burlington & Sedro Woolley in 1976

	Non-Highway Oriented Sales	Highway* Oriented Sales
Burlington:		
1st Quarter	90.32	9.68
2nd Quarter	89.39	10.61
3rd Quarter	85.52	14.48
4th Quarter	89.70	10.30
Sedro Woolley:		
1st Quarter	90.65	9.35
2nd Quarter	90.10	9.90
3rd Quarter	89.78	10.22
4th Quarter	92.09	7.91

* - Highway oriented businesses are all Service Stations, Restaurants, Hotels and Motels whether or not located adjacent to the highway. This table is based on retail sales tax only. Gasoline sales are not included.

Impact on Property Values

Property values in downtown Sedro Woolley will not be affected by a State Route 20 by-pass, because the existing route already by-passes the business district. In Burlington a by-pass would have a long-term beneficial impact on downtown property values. The absence of through traffic would allow local traffic easier access to the business district, which would increase the demand for these properties and hence their value.

Most property values along the alternates will increase near the right of way, especially at intersections. However, some farms may be adversely affected by having some fields severed by the highway. If no alternate to the existing highway is built, residential and business property along the existing route is expected to decline due to reduced accessibility and increased deterioration.

TABLE 6

Initial Reduction in Property Tax Revenues

	Total County Wide Revenue	Route #1		Route #2		Route #3		Route #4		Route #5		Route #6	
		Amount*	%	Amount*	%	Amount*	%	Amount*	%	Amount*	%	Amount*	%
Schools	8,900,000	24,100	0.27	33,700	0.38	10,600	0.12	26,000	0.29	29,800	0.34	49,100	0.55
Cities	1,300,000	3,500	0.27	4,900	0.38	1,500	0.12	3,800	0.29	4,300	0.34	7,200	0.55
County	2,700,000	7,300	0.27	10,200	0.38	3,200	0.12	7,900	0.29	9,100	0.34	14,900	0.55
Other	1,800,000	4,900	0.27	6,900	0.38	2,200	0.12	5,300	0.29	6,100	0.34	9,900	0.55
Total	14,700,000	39,800	0.27	55,700	0.38	17,500	0.12	43,000	0.29	49,300	0.34	81,100	0.55

* - Amount of initial reduction in property tax revenue due to taking of right of way.

Impact on Taxes

The average property tax levy in Skagit County is $15.92 per $1000 of assessed valuation. In 1976 these levies yielded $14.7 million tax dollars. State-owned land is not taxable, so that acquisition of land for any of the alternates will temporarily decrease the county tax base. The decrease will be slight even if Route 6, the route with the highest property values, is chosen. In 1976 acquisition of the right of way for Route 6 would have decreased the county property tax revenue from $14.7 million to $14.6 million. The initial losses are broken down by use category in Table 6. Tax losses from highway projects are considered short-term losses, because land values surrounding highway improvements traditionally increase.

There is no indication that sales tax revenues would be adversely affected, because retail sales are expected to improve, rather than decline, if State Route 20 is constructed on a new alignment.

Benefit/Cost Ratio

The benefit/cost ratio is strictly an economic comparison of user benefits and highway costs. In computing user benefits, travel on all major roads through the corridor was considered, as many trips will divert from one roadway to another for the various routes analyzed. If a new route results in less miles traveled and time spent as compared to the existing route, the new route benefits the users of the highway system. If that benefit is greater than the cost of construction over a given period of time, then its benefit/cost ratio is greater than one, and is therefore considered economically efficient. A negative benefit means that the user cost is higher with the new route than with the existing resulting in a negative benefit/cost ratio. The benefit/cost ratio is only one tool in the overall evaluation of a project. Social and environmental factors must be evaluated separately, because they cannot be assigned dollar values. Figure 21 evaluates these various factors and indicates an overall evaluation.

User benefits are calculated by adding the running cost of the vehicle (number of vehicle miles x cost per mile) and the value of the travel time of the vehicles' occupants between a point of origin and the destination. The route traveled is not necessarily the proposed route but rather the shortest route between points, because the comparison takes into account the effect of each alternate on the entire system of roads in the study area.

In order to determine the highway costs, the project's market value in the year 2000 was subtracted from the actual cost of construction and the maintenance costs. All values were discounted to their present market value for the sake of comparison.

According to the benefit/cost ratio, routes 2 and 5 are the most economical long-term investments, with a return of more than two dollars for every dollar spent. (See Figure 18) Although the initial cost of these routes is higher, the lower user costs will more than offset the initial investment. Routes 2 and 5 will cost users less because the distance and travel time will be reduced for the greatest percentage of traffic (that traveling between the south on Interstate 5 and the east on State Route 20). The result is a more efficient roadway network as a whole.

Routes 4 and 6 have benefit/cost ratios of less than 1.0 indicating costs of the improvements are greater than the user benefits. Routes 1 and 3 have negative benefit/cost ratios indicating that user costs are greater than on the existing route. Routes 1 and 6 have a higher total user cost than the existing route because of a combination of the following factors: (a) more vehicles are traveling a longer distance; (b) the vehicle speeds are slower which raises the value of travel time.

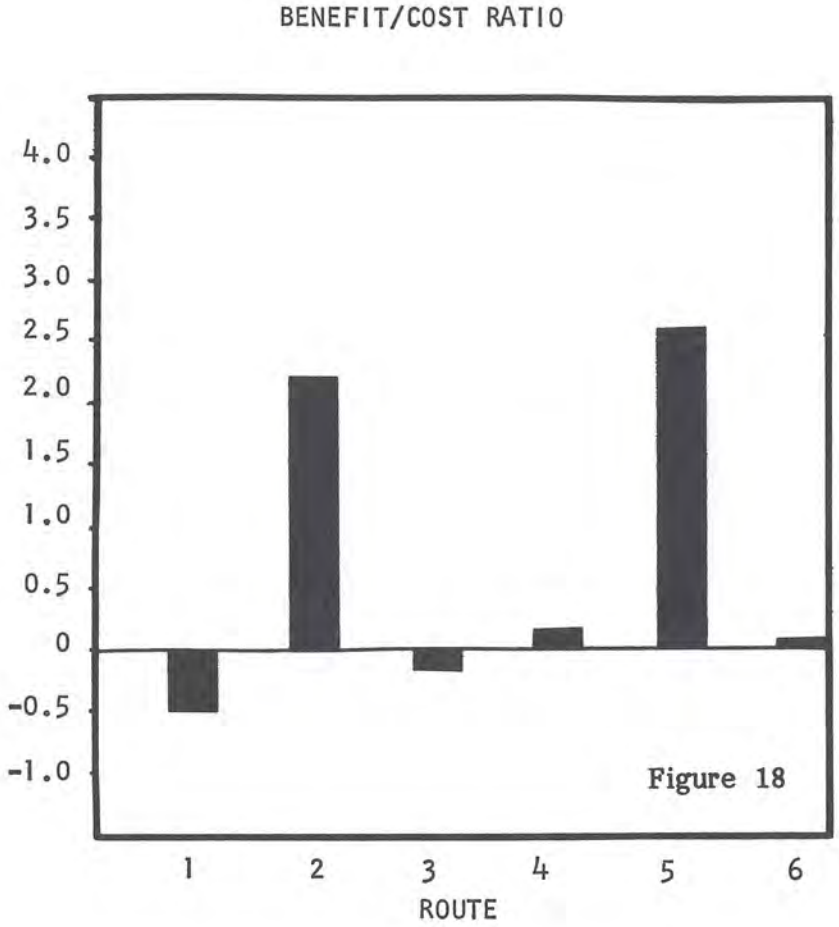


Figure 18

TABLE 7
BENEFIT/COST COMPARISON

Route	Benefits				Benefit Discounted to Present Value	Costs				B/C Ratio
	1977		2000							
	User Cost	Benefit	User Cost	Benefit		Capital Investment Present Value	Maintenance Cost Present Value	Residual Value Present Value	Total Hwy. Cost Present Value	
Exist	34,234,545		72,786,110			-0-	534,798	-0-	534,798	
1	35,479,825	(-245,280)	73,298,570	(-512,460)	(-5,181,296)	11,500,000	1,553,345	2,799,512	10,253,833	(-0.51)
2	33,705,195	1,529,350	69,637,255	3,148,855	32,067,136	16,600,000	2,761,988	4,016,691	15,345,297	2.09
3	35,318,860	(-84,315)	72,968,975	(-182,865)	(-1,815,307)	12,600,000	1,458,647	2,414,072	11,644,575	(-0.16)
4	35,163,005	71,540	72,652,155	133,955	1,430,102	14,700,000	1,742,159	3,387,815	13,054,344	0.11
5	33,693,150	1,541,395	69,612,070	3,174,040	32,321,680	16,100,000	1,739,245	3,773,255	14,065,990	2.30
6	35,198,775	35,770	72,726,250	59,860	676,427	18,800,000	1,251,184	5,010,720	15,040,464	0.04

ESTIMATED COSTS

Construction costs for the first four alternates were estimated in 1970. Table 8 gives the 1970 estimated costs for these routes from Interstate 5 to Sedro Woolley as estimated for the 1970 Advance Planning Study. Table 9 shows these costs inflated to a 1977 cost index and in addition shows the 1977 estimated costs for the two new routes considered in this study (Routes 5 and 6).

An inflation factor of 1.532 was derived from data published in the magazine "Engineering News Record" on June 23, 1977. According to the article the cost of highway construction in the State of Washington increased 53.2% between 1970 and 1977. Construction costs for alternates 5 and 6 were estimated by finding the cost of similar 100-foot roadway sections in the four original routes and applying the 1.532 inflation factor to bring the costs up to date. Bridge costs for routes 5 and 6 were estimated by figuring the number of square feet of bridge deck and multiplying that number by the current cost per square foot for the type of construction planned. Engineering and contingency fees were figured as a constant 25% of the construction costs for the 1977 estimates (preliminary engineering 10%, construction engineering and contingencies 15%). The engineering and contingency factors used for the 1970 estimates (18% to 21% depending on the estimated construction amount) were more realistic for that time period. Sales tax on the construction cost was also added to the 1977 estimates. Since sales tax was not levied against highway construction prior to 1971, the 1970 estimates did not include sales tax.

It was impossible to find a realistic inflation factor for right of way costs to apply to the 1970 estimates because of the irregular nature of recent local land development trends. Therefore, right of way costs for all six alternates were estimated based on 1977 Skagit County land values. An additional 40% was added to the estimated right of way costs to cover the costs of acquisition.

TABLE 8

1970 ESTIMATED COSTS SR 5 TO SEDRO WOOLLEY
Cost Figures in Millions of Dollars

	Rt 1	Rt 2	Rt 3	Rt 4
Construction Cost	5.7	9.1	6.4	7.4
Engr. & Contingencies	1.2	1.7	1.2	1.4
Subtotal	6.9	10.8	7.6	8.8
Right of Way	0.6	1.0	0.6	0.9
Total Cost	7.5	11.8	8.2	9.7

TABLE 9

1977 ESTIMATED COSTS SR 5 TO SEDRO WOOLLEY
Cost Figures in Millions of Dollars

	Rt 1	Rt 2	Rt 3	Rt 4	Rt 5	Rt 6
Construction Cost	8.8	12.8	9.7	11.3	12.4	14.5
Sales Tax (5.1%)	0.5	0.6	0.5	0.6	0.6	0.7
Engr. & Contingencies	2.2	3.2	2.4	2.8	3.1	3.6
Subtotal	11.5	16.6	12.6	14.7	16.1	18.8
Right of Way	2.5	3.5	1.1	2.7	3.1	5.1
Acquisition Cost (40%)	1.0	1.4	0.4	1.1	1.2	2.0
Subtotal	3.5	4.9	1.5	3.8	4.3	7.1
Total Cost	15.0	21.5	14.1	18.5	20.4	25.9

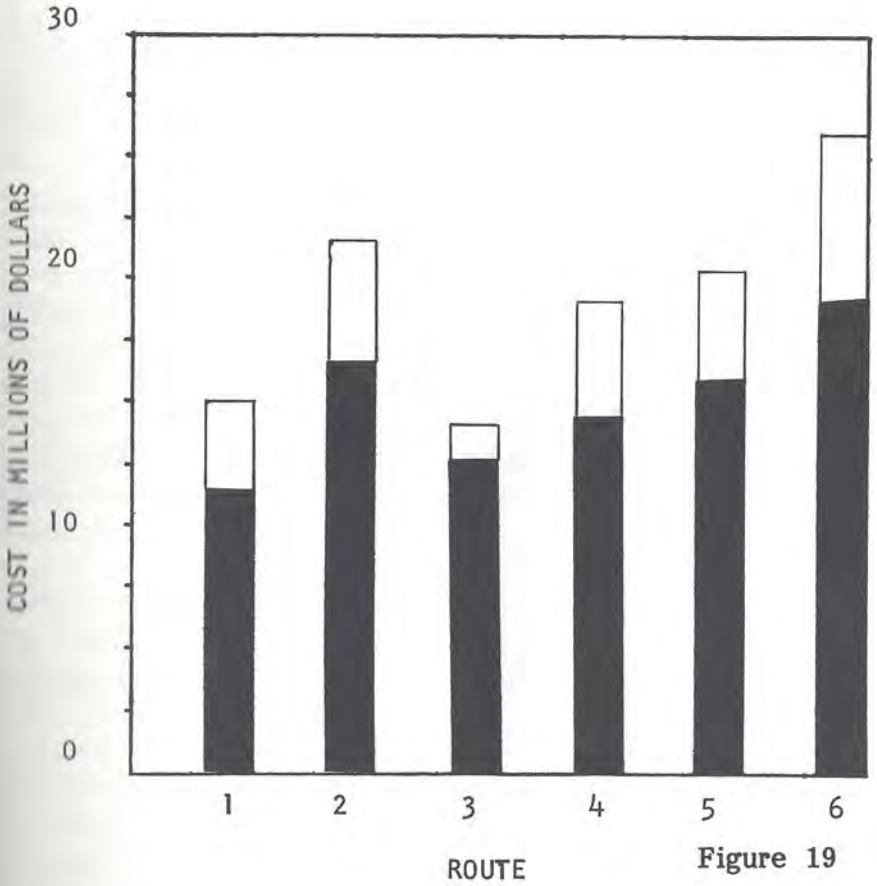
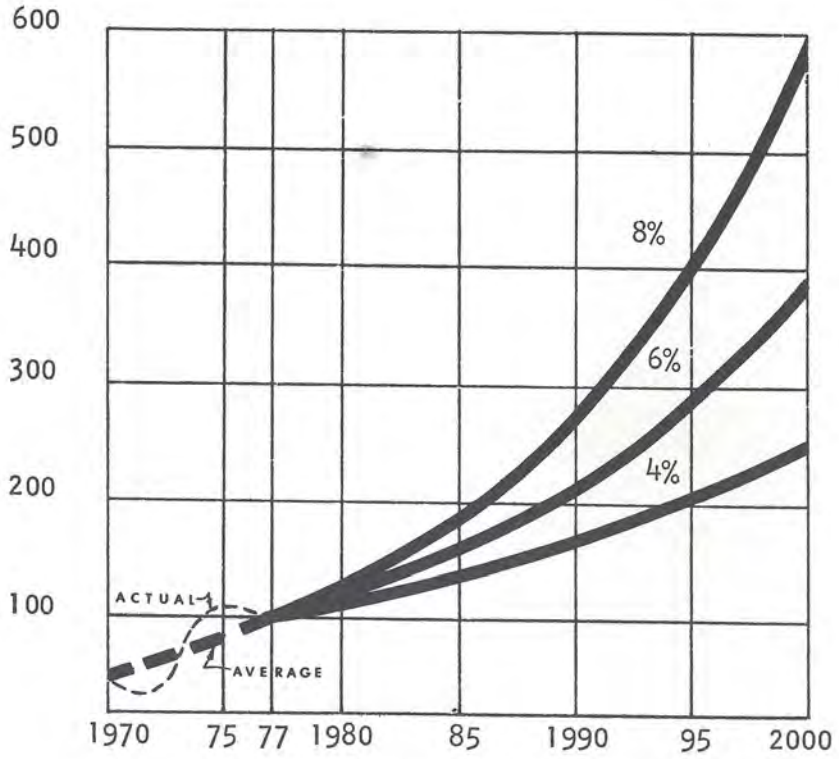


Figure 19



Effects of Inflation **Figure 20**

EFFECTS OF INFLATION

The cost of highway construction in the State of Washington increased by 53.2% during the seven year period between 1970 and 1977. This represents an average annual inflation rate of 6.3%. By referring to the graph in Figure 20, estimated construction costs can be projected into the future if the annual inflation rate can be predicted. For example, if the annual inflation rate is predicted to be 6%, the cost in 1985 will be 1.6 times the 1977 cost.

Future right of way costs are impossible to predict using simple cost indeces. Future property values can sometimes be predicted but development patterns cannot. Without knowing when and how much development will occur in the right of way of the various routes, there is no way to quantify the effect of inflation except to say that it will be significant.

SOCIAL AND ENVIRONMENTAL EVALUATION

The environmental and social consequences of highway construction are important factors in the route selection process. Additional land for right of way would be needed along all of the routes considered in this study and people, homes and businesses would be displaced or disrupted. Table 10 shows the number of family units, people, businesses, and employees that would be displaced by each route. The route selected should be consistent with local land use plans, since land use and growth patterns would be influenced by the highway's location. The Burlington City Council, recognizing the need for a by-pass route, has tentatively recommended a southern route which would originate at the George Hopper Interchange.* The development trend in Sedro Woolley is toward expansion north of the City. Any route by-passing Sedro Woolley to the north would have an impact on this growth pattern.

The routes that by-pass Burlington and/or Sedro Woolley to the south would have an impact on the Skagit River, although the impact would not necessarily be negative. Public access points, scenic views and recreational provisions could be incorpoated into the design, and natural areas could be left undisturbed where feasible. Less farmland would be disrupted by the routes that are close to the Skagit River because fewer commercial farms would be severed than on any of the northern routes.

A preliminary noise impact assessment was conducted for each of the alternatives. It was found that present noise levels along the existing route are slightly below the noise standard for commercial property and slightly above the standard for residential property. The predicted noise levels along the existing route in the year 2000 would increase in both Burlington and Sedro Woolley to slightly above the standard for commercial properties if no by-pass route were constructed. With a by-pass route, noise levels along the existing route would decrease to below the standard

*** - General Plan - Burlington and Vicinity, Lou St. John & Associates, April 1975, Page 19.**

Table 10
Displacements

ROUTE	1	2	3	4	5	6
Family Units	44	33	10	29	16	52
Persons *	154	115	35	102	56	182
Businesses **	2	1	0	0	2	8
Employees **	19	10	0	0	13	28

* - Assumes 3.5 persons per family unit.
**- Does not include farms.

for residential property. Predicted noise levels in the year 2000 along all of the alternatives would be above the standard for residential property and would range from below to slightly above the standard for commercial property. Route 1 would result in a noise impact to the greatest number of people, whereas Route 5 would impact the least number.

A preliminary review of air quality in the Burlington-Sedro Woolley area indicates that existing air quality is excellent. Monitoring by the Northwest Air Pollution Control Authority shows pollutant levels well below the National Ambient Air Quality Standards. A computer similation of the worst probable conditions in Burlington indicates that automotive related pollutants in the year 2000 would not violate air quality standards with or without a by-pass route. The do-nothing alternative would, however, cause the highest level of air pollution along the existing corridor. Route 1 would improve the air quality over the do-nothing alternative by about 20% and any of the other Route alternatives would increase the air quality over the do-nothing by 50% to 60% along the existing route. Air quality along any of the by-pass routes would present no adverse health effects.

Figure 21 is a capsule summary of the social, environmental and economic consequenses of the route alternatives. Each route has been given a rating of good, fair or poor for the 13 different factors. The evaluation is intended only as a guide since the individual factors do not necessarily carry the same weighting or importance.

Effects			Do Nothing	Alternate Routes 1	2	3	4	5	6
Economic Impacts	Road User Benefit		○	○	●	○	○	●	○
	Community Costs (Tax Base)		●	◑	◑	●	◑	◑	○
	Retail Sales		○	●	●	●	●	●	●
	Overall Economic Impacts		○	◑	●	◑	◑	●	○
Social	Displacements	Residents	●	○	◑	◑	◑	◑	○
		Businesses	●	◑	◑	●	●	◑	○
		Employees	●	○	◑	●	●	◑	○
	Community Planning	Burlington	○	◑	●	◑	◑	●	◑
		Sedro Woolley	◑	◑	◑	◑	◑	●	●
	Overall Social Impacts		●	○	◑	●	●	●	○
Environmental Impacts	River Environment		●	●	◑	●	●	○	◑
	Farmland		●	●	○	○	○	◑	◑
	Flood Control Potential		○	○	◑	○	○	●	○
	Scenic Values		○	○	◑	○	○	●	○
	Noise Impact/Air Quality		○	○	◑	◑	◑	●	◑
	Overall Environmental Impacts		◑	◑	◑	○	○	●	◑
Overall Evaluation			◑	○	◑	○	○	●	○

● Good (Most Favorable)

◑ Fair

○ Poor (Least Favorable)

FIGURE 21
ROUTE EVALUATION

FUNDING AND SCHEDULING

All of the highway construction proposals in the state are divided into three funding categories. Improvements necessary to sustain the structural and operational integrity of the existing highway system including roadway or surface reconstruction, bridge replacement and safety improvements are designated Category A projects and generally have the highest priority for funding. Category B projects are those that are eligible for Interstate funding. All major transportation improvements including projects that require new lanes or new alignment are designated Category C projects. Category C has a lower funding priority than A or B, although some money is appropriated for Category C projects each biennium. All of the Category C projects in the State must compete for these funds. They are ranked according to their financial feasibility, the way they fit into the total highway network, their compatibility with the stated goals of local transportation plans, and their public acceptance at the local level. Each biennium Category C projects are re-evaluated and ranked into a new priority array.

During the 1977 - 1979 biennium 50 million dollars were allocated statewide to Category C projects. The State Route 20 project ranked below 40th in Statewide priority, and received no funding. Federal funding for this functional class of highway is normally available for 80% of the project cost with the remaining 20% funded by State matching funds.

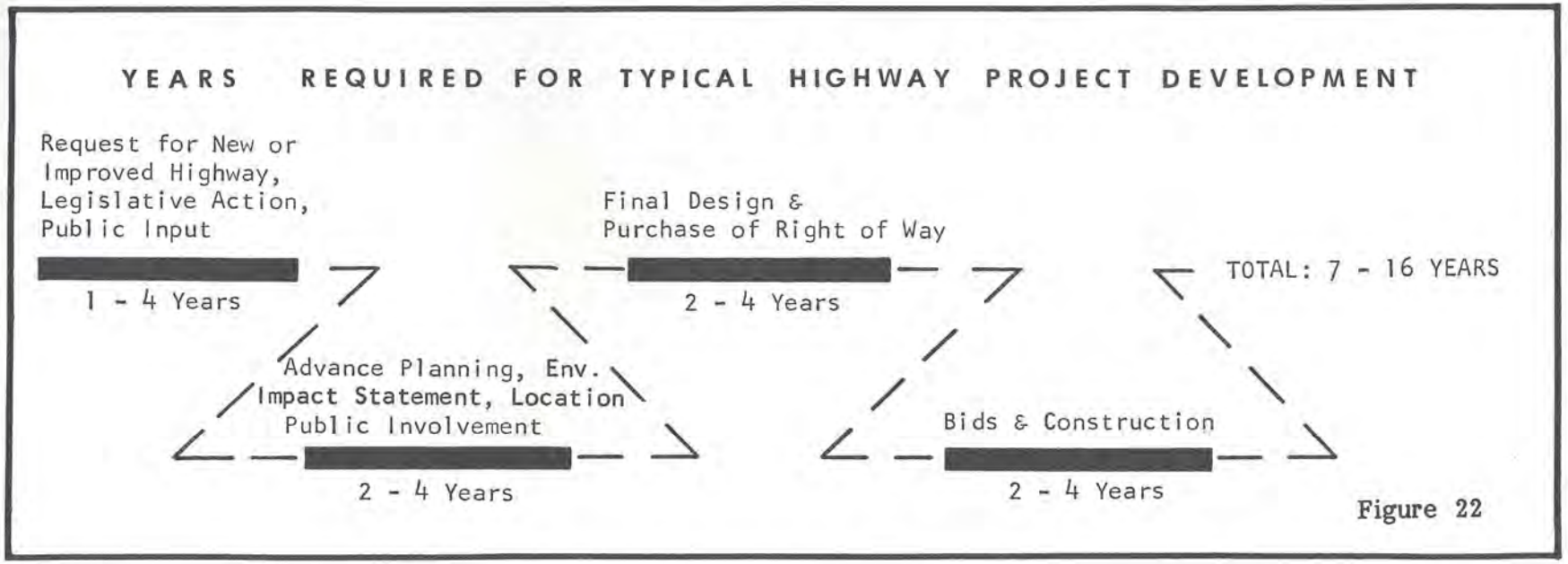


Figure 22