

Banff Highway Project

km 13 to km 27

Report of the
Environmental
Assessment
Panel



April 1982

PANEL REPORTS TO THE MINISTER OF THE ENVIRONMENT ON THE PANEL PROJECTS

1. Nuclear Power Station at Point Lepreau, New Brunswick. (May, 1975)
2. Hydro Electric Power Project, Wreck Cove, Cape Breton Island, Nova Scotia. (August, 1976)
3. Alaska Highway Gas Pipeline Project, Yukon Territory. (Interim report, August, 1977)
4. Eldorado Uranium Refinery Proposal, Port Granby, Ontario. (May, 1978)
5. Shawkwak Highway Project, Yukon Territory — British Columbia. (June, 1978)
6. Eastern Arctic Offshore Drilling — South Davis Strait Project, N.W.T. (November, 1978)
7. Lancaster Sound Offshore Drilling Project, N.W.T. (February, 1979)
8. Eldorado Uranium Hexafluoride Refinery, Ontario. (February, 1979)
9. Roberts Bank Port Expansion, British Columbia. (March, 1979)
10. Alaska Highway Gas Pipeline, Yukon Hearings. (August, 1979)
11. Banff Highway Project (east gate to km 13). Alberta (October, 1979)
12. Boundary Bay Airport Reactivation, British Columbia. (November, 1979)
13. Eldorado Uranium Refinery, R.M. of Corman Park, Saskatchewan. (July, 1980)
14. Arctic Pilot Project (Northern Component) N.W.T. (October, 1980)
15. Lower Churchill Hydroelectric Project. (December, 1980)
16. Norman Wells Oilfield Development and Pipeline Project. (January, 1981)
17. Alaska Highway Gas Pipeline, Yukon Territory (July 1981) (Routing Alternatives Whitehorse/Ibex Region)

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Government of Canada Gouvernement du Canada

Environmental
Assessment Review

Examen des évaluations
environnementales

Hull, Quebec
K1A 0H3

The Honourable John Roberts, P.C., M.P.
Minister of the Environment
Ottawa, Ontario

Dear Minister:

In accordance with the Federal Environmental Assessment and Review Process the Banff Highway Environmental Assessment Panel has completed a review of Public Works Canada's proposed modifications to the Trans-Canada Highway from km 13, near Banff town to km 27 near the Sunshine Road.

After thorough examination the Panel has concluded that a demonstrated need exists for twinning of the highway from km 13 to the Bow Valley Parkway (km 23) and that this twinning could be environmentally acceptable provided certain conditions, outlined in the report, are met.

The Panel considers that between km 23 and km 27 alternatives could reduce congestion, at least in the short term, and is recommending that a decision on this section be postponed until more comprehensive studies are completed.

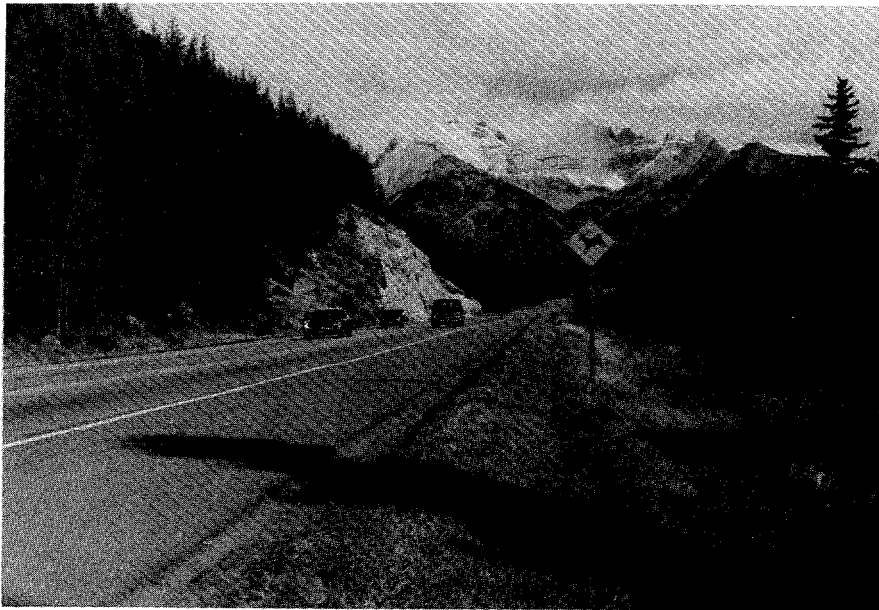
Respectfully yours,

P. J. Paradine
Chairman
Banff Highway
Environmental Assessment Panel

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EXECUTIVE SUMMARY



This report conveys the findings of an Environmental Assessment Panel review of a proposal by Public Works Canada to upgrade 14 kilometres of the Trans-Canada Highway (TCH) in Banff National Park to provide a four-lane facility. The review results from a proposal by Public Works to upgrade the TCH in phases from the Park's East Gate (km 0) to km 27 near the Sunshine Road.

The report covers the second Phase of the overall proposal, namely km 13 to km 27. The first Phase, from km 0 to km 13, is presently under construction, having been the subject of a separate review in 1979.

Included in the km 13 to km 27 twinning proposal are new interchanges to provide access to the Banff town-site and the Sunshine ski area as well as modifications to existing interchanges at Norquay and the Bow Valley Parkway (Highway 1A). The proposal would follow the alignment of the existing two lanes which would be incorporated as part of a new divided, limited access highway.

As part of its review, the Panel solicited public and technical agency comment on an Environmental Impact Statement submitted by the proponent in August 1981. The Panel held information sessions in September 1981 and, following the receipt of written comments, heard discussion on the issues at public meetings held in January 1982. Information sessions and public meetings were held in both Calgary and Banff.

The majority of concerns raised by intervenors related to broad issues of planning, management and transportation needs in and around Banff National Park. Specific environmental issues regarding Phase II included wildlife and terrain impacts. In addition the proponent's phased approach to twinning of the highway was the subject of much discussion.

The Panel's review has led to the conclusion that there is a demonstrated need for twinning the TCH from km 13 to the junction with the Bow Valley Parkway (km 23) and that this could be environmentally acceptable provided certain conditions are met. In order to reduce disruption in the Park, the Panel is recommending that construction of this section be accelerated.

Beyond km 23 the Panel concludes that use of the Bow Valley Parkway and public transportation to ski resorts, particularly Sunshine, could provide alternatives for Park user traffic and reduce congestion on the TCH, at least in the short term. The Panel is therefore recommending that a decision on modifications beyond km 23 be postponed until the effectiveness of these alternatives has been assessed. Determination of the relative priorities and benefits of any improvements that might be necessary to the remaining sections of the TCH in Banff National Park is also recommended before a decision is taken to expend funds in twinning between km 23 and km 27.

The Panel is making further recommendations for studies by Parks Canada, Public Works and Transport Canada to assist in long-term Park and TCH planning. An interdepartmental committee to coordinate the study of transportation matters involving Mountain Parks is proposed.

With regard to specific environmental impacts the need to eliminate ungulate kills on the highway and reclaim disturbed areas is addressed. Specific conditions include under and over-passes and fencing, further soils investigations of cuts and borrow pits and appropriate designs to deal with the special conditions encountered in the Park. The Panel also makes recommendations for monitoring and evaluation of the effectiveness of the mitigation measures established as conditions for the project to proceed.

"We have had to terminate Phase II some place, short of the Yoho west gate at least, and we chose what we thought and what we still think was a logical termination for Phase II at Sunshine.

We don't rule out that the Bow River may have been a logical termination. Had we perhaps contemplated the traffic growth as rapid as it has been over the last few years, we might have gone to Eisenhower as the next phase. We have to develop our engineering plans; we have to do the environmental assessment of these sections and our view right now is that we are taking it in as about a big bite as we and you, the public, and the Panel can handle. So, there is a whole series of reasons why we terminated there."

D. Reid
Public Works

"So, I am just wondering what is the attraction of building a four-lane highway between the Sunshine turnoff and the Banff turnoff and whether or not there could be an alternative to that rather than going to the large expense of putting in four lanes?"

R. Sloane
Alberta Wilderness
Association

"The reason we chose to stop at km 27 on the Sunshine turnoff being the access to a heavy skied area, is that the skiing traffic is growing very rapidly. If it wasn't for that we would have stopped I think at the junction with the Bow Valley Parkway.

We also - another reason that we stopped at 27 is that the Bow Valley Parkway is being reconstructed and it will carry on and be reconstructed all the way to Lake Louise. My best guess will be that will be with us as a reconstructed highway- to that point by some time 1984, 1985. We would very much like to wait at least until the Parkway is rebuilt to measure, to count how much traffic will use that highway and to what extent it might alleviate congestion of the Trans-Canada Highway."

N. Huculak
Public Works

"But certainly the economics of constructing either from the interchange or from the Bow River suggests that it is a considerable investment to go that additional distance to Sunshine, and that should be looked at quite specifically in terms of the benefits that that generates."

S. Herrero
National and
Provincial Parks
Association of
Canada

"My first question is whether or not Public Works could view this project in stages at all. What I am wondering is whether or not it is an all or nothing proposition to you. I would also be interested to know if the Panel views this as an all or nothing proposition, because I think there are several stages en route to the Sunshine turnoff that are possibly logical cutoff points for this kind of highway expansion. The first one being the new interchange to replace the traffic circle which you guys should have had in Phase I.

The second one is the Norquay Interchange. The third one is whatever sort of interchange would tie in with the Bow Valley Parkway.

So I wonder again if this is an all or nothing project to you people?"

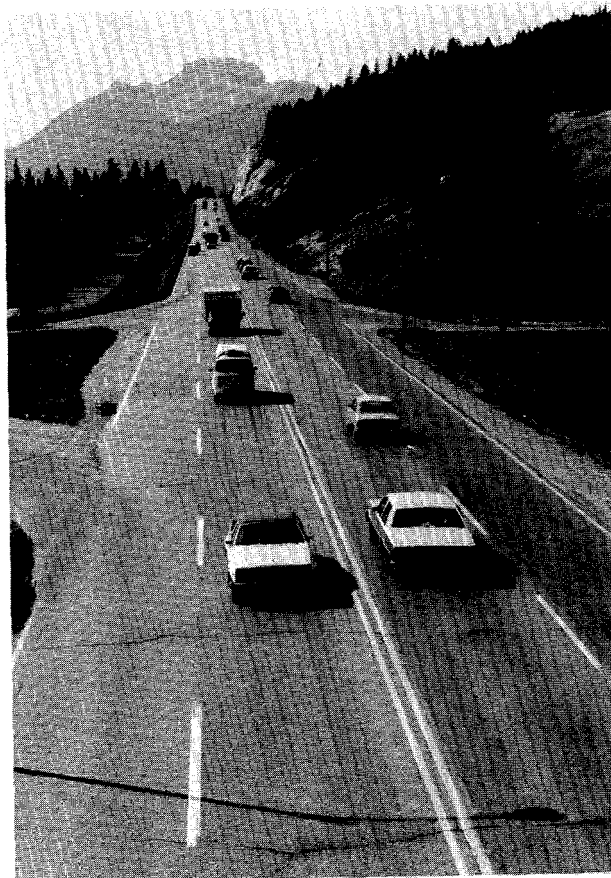
M. McIvor
Federation of
Alberta
Naturalists

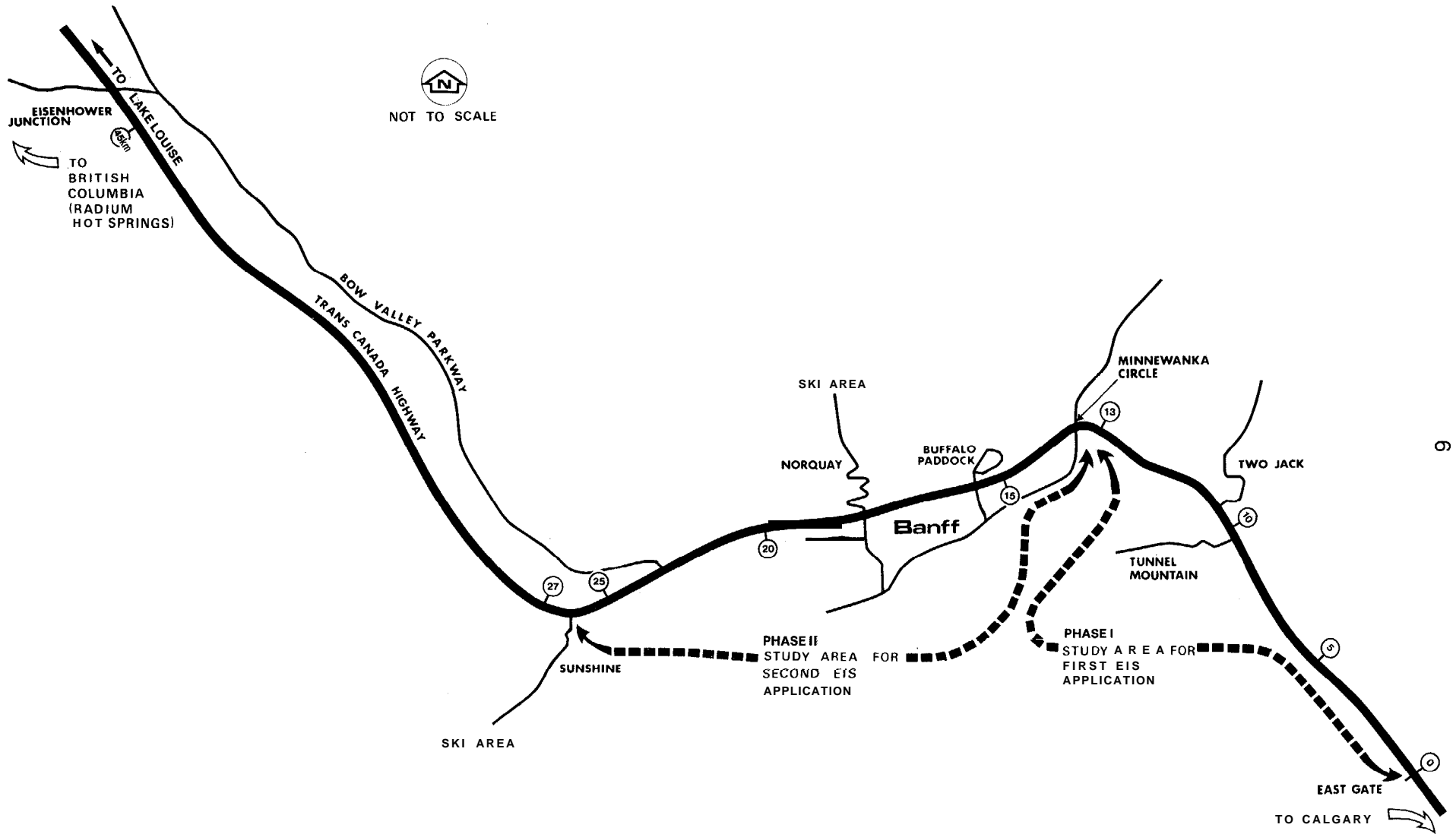
"No, I don't think it is an all or nothing project. I think there is a bit of a parallel between the possible phasings of this and the phasings of the first phase where we discussed at some length whether that was an all or nothing project, We think by the time the hearings have been concluded that we will be able to convince the Panel and the public that all of the projects should proceed. If we are unable to do so we would be prepared to accept some other points of ending, and I think the ones you have mentioned are those that are possible. We don't think they are desirable but certainly we wouldn't say it is all or nothing."

D. Reid
Public Works

CHAPTER 1

PROJECT AND REVIEW PERSPECTIVE





Phase I and Phase II
Trans-Canada Highway,
Environmental Review

Figure 1

1.1 INTRODUCTION

This report sets out the findings of the Environmental Assessment Panel concerning a proposal by Public Works (Public Works Canada) to twin a section of the existing two-lane Trans-Canada Highway (TCH) in Banff National Park. The section reviewed starts approximately 13 km from the East Gate of the Park and continues to km 27 near the Sunshine Road. It is known as Phase II (Figure 1).

This current review is consequent to a 1979 Panel report on Phase I (km 0 to km 13) which advised that the first stage could be environmentally acceptable, provided that certain conditions were followed. This recommendation was endorsed and work on Phase I is currently underway.

The present, Phase II, review was based upon an Environmental Impact Statement received from Public Works in August 1981 and subsequent public and technical agency comments solicited by the Panel. In particular public information sessions and meetings were held in both Calgary and Banff in September 1981 and January 1982.

The project setting and background were described in detail in the Panel report on Phase I and are included in Appendix A. The conclusions and recommendations of that report are in Appendix B.

No proposal has been submitted by Public Works for modifications beyond km 27. However, during the public meetings Public Works expressed the view that any westward extension of the twinning would have to be examined and fully considered.

1.2 PROJECT DESCRIPTION

The section of highway that is the subject of the present review starts at km 13, approximately 0.5 km east of the existing Banff traffic rotary (the Minnewanka traffic circle). The Public Works proposal closely follows the existing highway alignment to the Sunshine Road near km 27 (Appendix H) and would provide a four-lane, divided, limited access highway.

It is proposed to replace the existing Minnewanka traffic circle with a grade separated interchange (Figure 2). Banff town traffic would pass below the CPR right-of-way. A raised barrier median would be utilized through the interchange following which there will be a reversion to a depressed grass median. The proposed design would allow for the retention of the airstrip in its present orientation and location.

A second bridge would be constructed over Forty Mile Creek and approaching the Norquay interchange a raised concrete barrier median would again be utilized. Proposed improvements to this diamond type interchange include relocation of a short section of the Vermilion Lakes road. No further adjustment to this road is proposed at this time.

Moving westward the alignment enters a very constrained area between the Vermilion Lakes and surrounding mountains. Space limitations require the continuing use of a raised concrete barrier median through this section. An off-highway parking area for westbound traffic would be constructed together with a pedestrian underpass to provide access to the existing Big Horn Sheep Exhibit and Viewpoint across the Vermilion Lakes. Eastbound traffic could take advantage of a simple off-highway access ramp to the viewing area. Due to space limitations, access from the TCH to the existing Mount Rundle Viewpoint would be eliminated.

There would then be a reversion to the depressed grass median leading up to a modified junction with the Bow Valley Parkway at km 23. A second bridge would be constructed over the Bow River. The final 4 km of the project would include a grass median and an interchange at the Sunshine Road (turnoff to the Sunshine ski area).

The Public Works proposal includes fencing of the right-of-way and provision for animal under or over-passes at various locations.

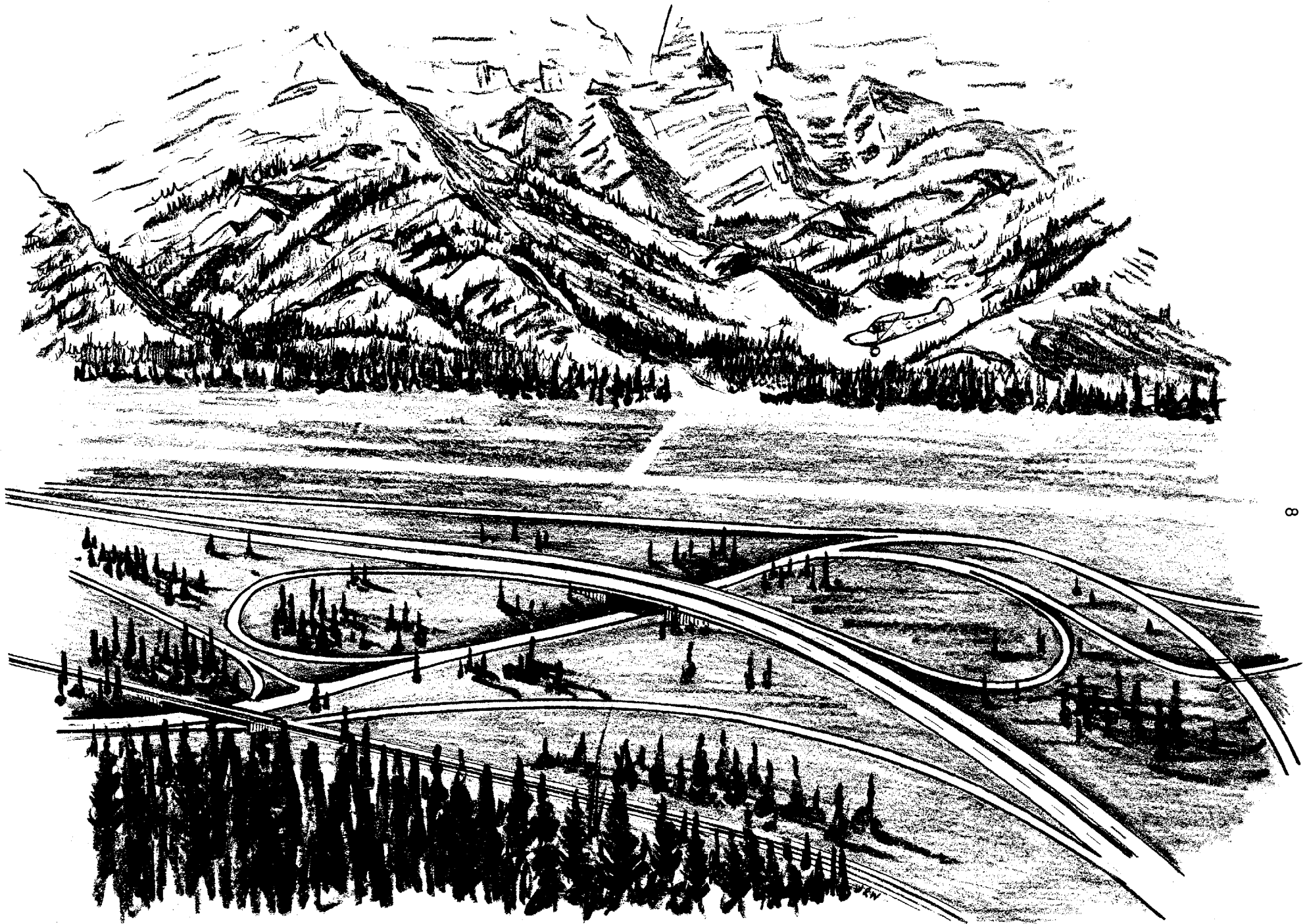
The total estimated cost of Phase II is \$33.5 million.

1.3 ENVIRONMENTAL REVIEW PROCESS

1.3.1 Referral and Previous Review

The proposed modifications would eventually result in twinning the TCH between the Park East gate and km 27 near the Sunshine Road. In May 1978, this twinning proposal was referred by the proponent, Public Works, to the Federal Environmental Assessment Review Office (FEARO) for a formal review under the Environmental Assessment and Review Process (EARP).

A Panel was appointed to review the environmental consequences of the project and in September 1978, issued Guidelines for the preparation of an Environmental Impact Statement (EIS). Although the Guidelines applied to the full project, it was subsequently decided to review the undertaking in two phases. Consequently in February 1979 the Panel received from Public Works an EIS entitled "Proposed Improvements to the Trans-



Sketch of Proposed Minnewanka Interchange

Figure 2

Canada Highway in Banff National Park, East Gate to km 13" and following a public review the report of the Panel was submitted to the Minister of Environment in October 1979.

1.3.2 Environmental Assessment Panel

In accordance with EARP directives experts were appointed to the Panel in 1978 to review the environmental consequences and to evaluate the significance of both phases of the project. Two of the members of the Panel were unable to continue to serve for the review of Phase II and, therefore, in February 1981, the Minister of Environment announced that the retiring members Mr. J.S. Klenavic and Dr. R. Edwards would be replaced by Mr. P.J. Paradine of FEARO (Hull) as chairman and Dr. J.S. Tener. The composition of the Banff Highway Panel for the review of this second Phase is as follows:

Mr. Philip J. Paradine (Panel Chairman)
Federal Environmental Assessment
Review Office
Hull

Mr. Wyman R. Binks
Professional Engineer
Ottawa

Mr. James E. Hartley
Parks Canada
Calgary

Dr. William A. Ross
Faculty of Environmental Design
University of Calgary
Calgary

Dr. John S. Tener
Zoologist
Ottawa

Biographies of Panel members are contained in Appendix C.

1.3.3 Public Information and Participation

In the Spring of 1981, a series of meetings was held with groups and agencies which had participated in the review of the first Phase to discuss the review of the second Phase. The mailing list for the review of Phase I was brought up-to-date and utilized to distribute pertinent information to interested persons.

Public Works submitted the Phase II EIS to the Panel in August 1981 and copies were made available by the

Panel Secretariat to interested members of the public and government agencies. The EIS was also deposited for viewing in public libraries in Calgary, Banff, Canmore and Edmonton, as well as other viewing centres. Announcements of the availability of the EIS were placed in newspapers in Calgary, Edmonton and Banff.

Public information sessions were held in Banff, September 29, 1981 and in Calgary, September 30, 1981. The purpose of these sessions was to provide an opportunity for participants to ask questions about the EIS and the project. Approximately 150 people attended those sessions and nearly 60 people questioned the proponent. Transcripts of the proceedings amounted to 174 pages.

Some of the questions prompted the proponent to supply further information such as: 1) a proposal for access to the Mount Rundle Viewpoint from the Vermilion Lakes Road; 2) data on animal/vehicle accidents for the TCH in Banff National Park for 1978, 1979 and 1980, and 3) principles and details of animal fencing and crossing structures.

In the notices announcing the public information sessions and the availability of the EIS, the Panel also indicated that written comments on the EIS and the project should be forwarded by October 29, 1981. A total of nine written briefs was received (Appendix D). These, along with the Public Works response, were distributed to interested parties prior to the public meetings.

1.3.4 Public Meetings

To allow the Panel to obtain further information on potential impacts of the project, public meetings on the proposal were scheduled. Notices of the meetings, as well as procedures and schedules, were advertised and mailed to interested parties.

Sessions were devoted to: the project as a whole; transportation analysis, need and alternatives; impact on wildlife resources and habitat; and general impact on park environment, planning and monitoring. Afternoon and evening sessions were held in Calgary on January 11 and 12, 1982 and in Banff on January 14. The final session, which was held in Banff on the afternoon of January 15, was allotted to participants to summarize their position concerning the project, taking into account information presented by others during the meetings. At each session, the Panel, proponent, intervenors, and the audience had the opportunity for participation in extensive question-and-answer periods.

Public Works, and Parks Canada, were represented throughout the meetings by senior departmental officials



and made numerous presentations. Private consultants who had contributed to the preparation of the EIS were also present for sessions dealing with specific issues as were Transport Canada representatives.

Representatives of environmental, transportation and business groups also made presentations as did other individuals interested in the project. A list of those making presentations is contained in Appendix D. Representatives of the media were present throughout the public meetings.

Thirteen written briefs were received by the Panel at the public meetings (Appendix D) and over 30 presentations were heard. The proponent tabled a revised construc-

tion schedule and some intervenors tabled supplementary information such as a design for a cattleguard and data on fatal accidents on the TCH between 1976-81. (A bibliography is provided in Appendix E).

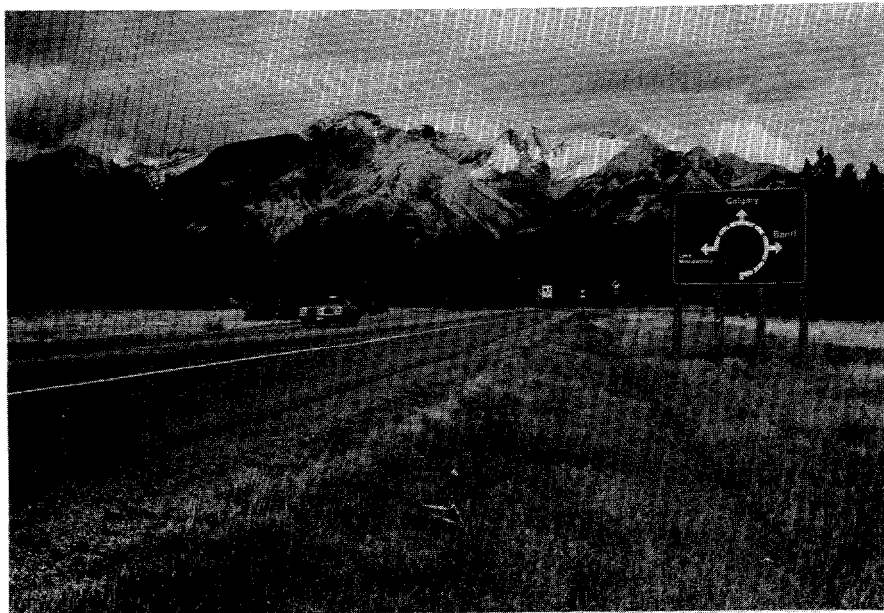
Transcripts of the proceedings (685 pages) are available through the Federal Environmental Assessment Review Office. The transcripts have been placed in viewing centres in Calgary, Banff, Canmore and Edmonton.

From the written material received and presentations made at the public information sessions and meetings, the Panel was able to acquire an understanding of the range of technical information and public opinion on this project. The following chapter discusses the specific issues of greatest concern.



CHAPTER 2

ISSUES AND IMPACTS



"The hazards posed by the present, over-taxed Trans-Canada to the species homo sapiens cannot be ignored. Over the past five years, there have been 37 fatal vehicle accidents on the section of highway that lies within the Park boundaries. These 37 accidents resulted in 61 deaths to homo sapiens. The completion of the twinning project will go a long way towards reducing this type of carnage."

K. Scott
Alberta Trucking
Association

"For a variety of reasons, a ban on automobile travel to certain Park features is logical and precedents are in place. Examples are the Sunshine Village Ski area where access is by a gondola system and Lake O'Hara where a bus service is provided. Parks Canada continues to monitor a variety of situations as demonstrated by the studies we carry out. When circumstances and economics are appropriate it is likely that additional restrictions on automobile travel will be given serious consideration. It is important to note however, that alternatives to the automobile must be not only convenient and attractive but politically acceptable."

J. Rouse
Parks Canada

"Secondly, we would recommend that a more comprehensive list of alternatives be explored, especially those which use a systems approach to solving the problems of transportation."

J. Mahoney
University of
Calgary

"Thus, when the twinned highway saturates does DPW propose to quadruple, etc, thereby continuing to solve the problem by more traffic lanes and permitting normal growth of traffic to occur, and eventually allowing better viewing opportunities of the asphalt/concrete of the world's first twelve-lane freeway in a National Park?

At some point it must be recognized, even by DPW, that the quality of the National Park must take priority over transportation needs, particularly the convenience of pleasure motorists causing traffic congestion, and numbers of tourists flocking to use the Park. Transportation has reached this decision point. A four-lane freeway destroys the very values being protected by the Park."

P. Vermeulen
Sierra Club of
Western Canada

2.1 PROJECT NEED AND ALTERNATIVES

The proponent presented, both in the EIS and at the public meetings, the case for expanding the present two-lane TCH to a four-lane facility. The need or requirement for increased capacity was based on the traditional methodology used by planners in practically all highway agencies in Canada. Basically it consists of determining traffic volumes at which levels of service on a rural highway become intolerable. The hourly volume usually chosen to determine the levels of service at which a highway is operating is the thirtieth highest hour volume of the study year.

The proponent maintained that the results from using this approach indicate that the existing two-lane highway does not have the capacity at this time to provide a satisfactory level of service. If traffic continues to grow, the level of service would worsen causing an increasingly greater number of hours of congestion. Accordingly the proponent has recommended that the remedy urgently required is the provision of a four-lane facility, and, in the EIS, noted that the traffic volume at points on Phase II of the highway is over 90% of that on the Phase I stage, which is presently being twinned. Appendix F gives technical data on traffic analysis and levels of service.

The proponent and some intervenors argued that as the road in question is the major east-west highway corridor through the Rocky Mountains, the provision of such a poor level of service is quite unacceptable and moreover such congestion is quite incompatible with enjoyment of the Park itself. The Alberta government supported the need for the project.

While most intervenors considered that congestion was a problem, a number of them felt that the approach used by the proponent was not valid in a National Park setting; that there are relatively few hours during the year that congestion occurs and that this should be accepted as a fact of life. One Parks Canada official indicated that there were 400 hours last year when the traffic was at what he considered to be undesirable congestion levels. Other intervenors claimed that the period of excessive high volume congestion was limited to four long weekends and that the proposed expenditure to address this problem was excessive.

During the Phase I review, the growth rate for traffic used by the proponent was questioned by a number of intervenors as being too high for a number of reasons including a possible gasoline shortage. It is interesting to note that the same growth rates were used for Phase II by the proponent but the general observation of intervenors this time was that if the growth rate continued as high as in the last few years congestion problems would

quickly reappear even on a four-lane highway. The proponent maintained that using a linear growth rate of 5% per annum, a four-lane facility would not reach the point of congestion which presently exists until the year 2020. With a 10% per annum linear growth rate the year would be 2000. The proponent estimates that the long term annual growth rate will be 3.2% and thus the provision of a four-lane facility is not a short term solution.

Some intervenors questioned the benefits to be received from such a large expenditure of funds. Some, including Parks Canada, suggested they might be better spent in carrying out improvements not only on the section under consideration but also west of km 27. There were suggestions that from a safety standpoint the section of highway under consideration is not as bad as sections west of km 27. There was however no disagreement that four-laning would improve the safety aspects of this highway.

A representative of the Alberta Trucking Association expressed the opinion that truck traffic would increase, not only due to normal growth, but because of the diversion of goods from railway to highway, particularly until such time as the railway is double tracked. Consequently he felt that if goods were to be moved with the maximum efficiency and economy, a four-lane highway is urgently required.

A Transport Canada representative believed that its highway branch would recommend endorsement of Public Works' proposal provided a favorable reaction was received from the Panel. Transport Canada was identified as having general transportation responsibilities for the federal government and had, in co-operation with the provinces, prepared the Pacific Rim Highway Access study which identified this section of the TCH as a problem area requiring attention.

Virtually all intervenors supported the need for an interchange to replace the existing Minnewanka traffic circle although there were differences of opinion about the design.

At the public information sessions, several questions on the rationale to twin beyond the Bow River Parkway were raised. Some statements identified skiers as the primary beneficiaries if the road was twinned beyond that point. The proponent indicated that the primary reason for four-laning to Sunshine at this time was because of benefits to winter usage. Public Works also maintained that while it considered there was enough traffic to justify twinning beyond Sunshine it would like to evaluate use of the Bow Valley Parkway after reconstruction to determine to what extent it might alleviate congestion on the TCH.

A variety of alternatives other than twinning were proposed by intervenors to deal with the congestion problem. These included a variety of spot improvements to the existing road, public transportation, alternative routes, and a comprehensive package composed of several of these options.

Some intervenors argued that with the use of some alternatives (typically spot improvements and public transportation) congestion on the highway would not be as serious as it is now. In addition it was maintained that Banff National Park should be protected from overuse (the number of visitors should not exceed its carrying capacity) in order that the Park be preserved for future generations. Since a four-lane highway could allow (if not encourage) more Park visitors, this was considered to be incompatible with the proper operation of Banff National Park. Refusing to four-lane the TCH was seen as one means of controlling Park use.

Spot improvements proposed to make the highway function better included passing lanes with appropriate signage, climbing lanes and widening of the pavement at picnic sites or at turns. Flow control structures and lower speed limits were also mentioned as were traffic management solutions such as reversing lanes. There was some dispute over how much improvement such measures would provide in terms of solving the congestion problems experienced on the road. Passing lanes, for example, were considered by Public Works and the Trucking Association as not likely to be of much use, particularly in heavy traffic situations, as those who pull over may have difficulty getting back into the traffic when the extra lane terminates. The proponent argued that while modest increases in capacity could result from spot improvements, the improvements would be totally insufficient to satisfactorily meet even the current demand, let alone future increases.

Public transportation was also mentioned by many intervenors as one alternative. This suggestion included buses, trains, and a Vertebrate train with its own elevated tracks next to the TCH. In view of the way that the TCH is used (as much as 70% through traffic on long weekends) or the preference that people have to use their cars, doubt was again expressed about whether this alternative could displace enough traffic from the highway to be a credible alternative in the short term. The argument for this alternative hinges on the acceptability of whatever means of incentives or coercion are necessary to displace enough people from private cars to public transportation. Measures mentioned included fee differentials, reduction in parking provisions at selected locations within the Park, and enhancing the visitor experience through public transportation by relieving driving pressures and increasing the potential

for observation and interpretation of the Park. Questions were also raised about the cost and environmental impact of public transportation.

During the meetings Parks Canada provided information on the use of public transportation in the Park. It believed that in order to reduce traffic to desirable limits stated in the EIS (900 to 1,200 vehicles/hr) there would be a need to divert over 40% of the traffic at times. Parks Canada's approach was one of considering additional vehicle use restrictions when circumstances and traffic are appropriate. Parks Canada advised the Panel of public transportation systems now available in the Park. Note was made by Parks Canada and some intervenors that the number of parking spaces at Sunshine had been limited and that public transportation would be necessary to deal with the excess of skier capacity over parking spaces.

The proponent was in favor of increased use of public transportation but considered that it was not a solution to the types of problems being faced. Public Works considered that it was responding to people's travel habits and that society would only accept gentle nudges towards change from the private automobile to public transportation. Some intervenors however considered that a more active approach should be taken in order to maintain Park values, rather than catering to automobile-orientated value systems.

Alternative routes were also presented. The proponent analysed a route south of the Vermilion Lakes but rejected it on environmental and engineering grounds in favour of the proposed route (Figure 3). There were no advocates for this alternative at the meetings. Other routes through the mountains were mentioned, mainly Howse Pass to the north and Elk Pass to the south (Figure 4). The Howse Pass route would go through Banff National Park and was unequivocally rejected by Parks Canada because of a policy not to open new routes in a National Park. The Elk Pass route is within the Alberta Provincial Park system and the Panel was informed that it was not available for use because of its park classification.

At km 23, the junction of the TCH with the Bow Valley Parkway (Highway 1 A), traffic has two options west of that point. The main route of course is the TCH. The Bow Valley Parkway is a scenic route with lower design standards intended for Park visitor traffic rather than for through traffic. Notwithstanding these lower standards, Public Works stated that the capacity of the Parkway is between 500 and 600 vehicles per hour and present usage is given in the EIS as 140 for the thirtieth highest hour. Public Works' opinion was that the Parkway is capable of accommodating all growth forecast for the TCH over the next five or six years. (This information

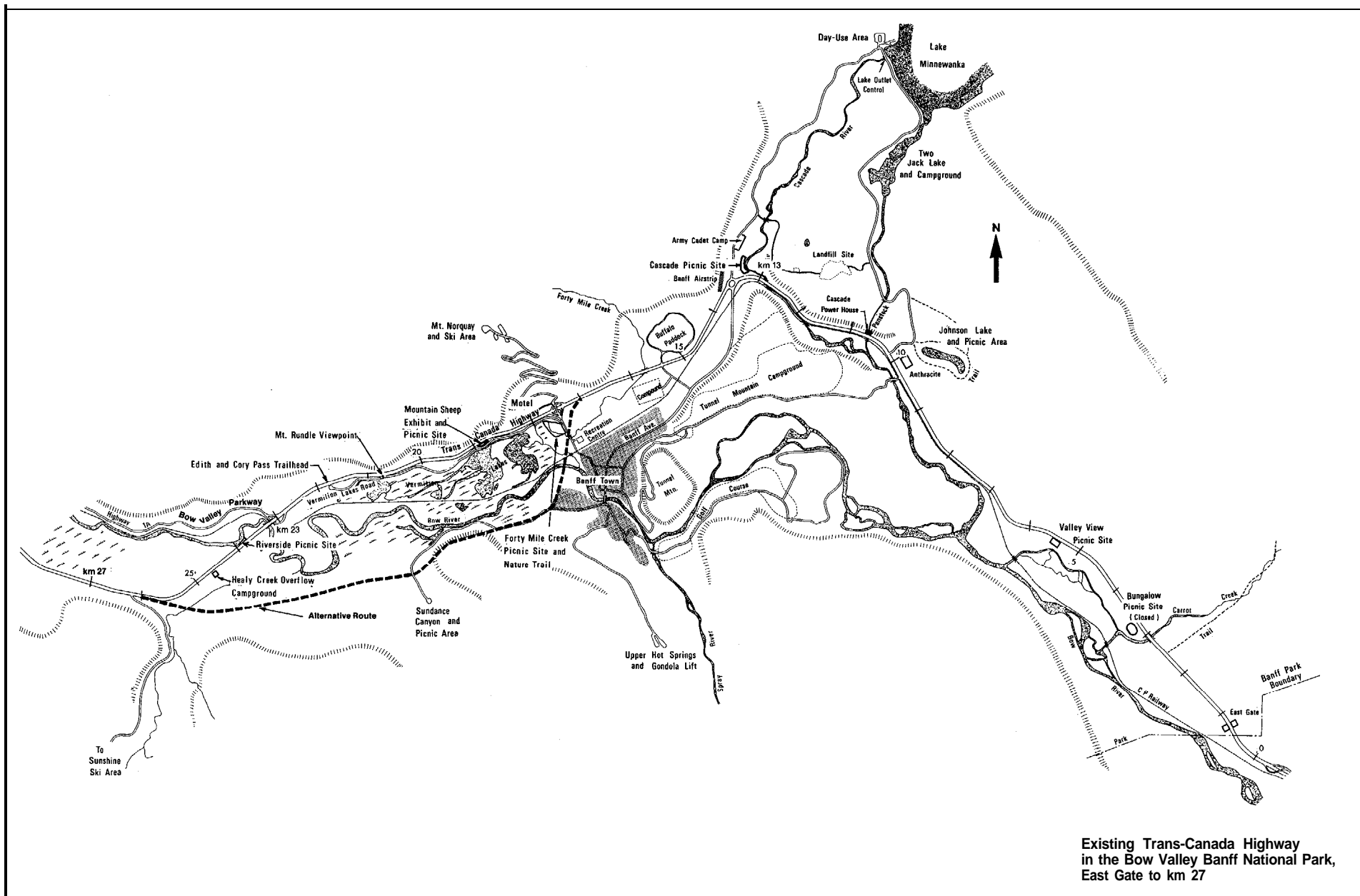
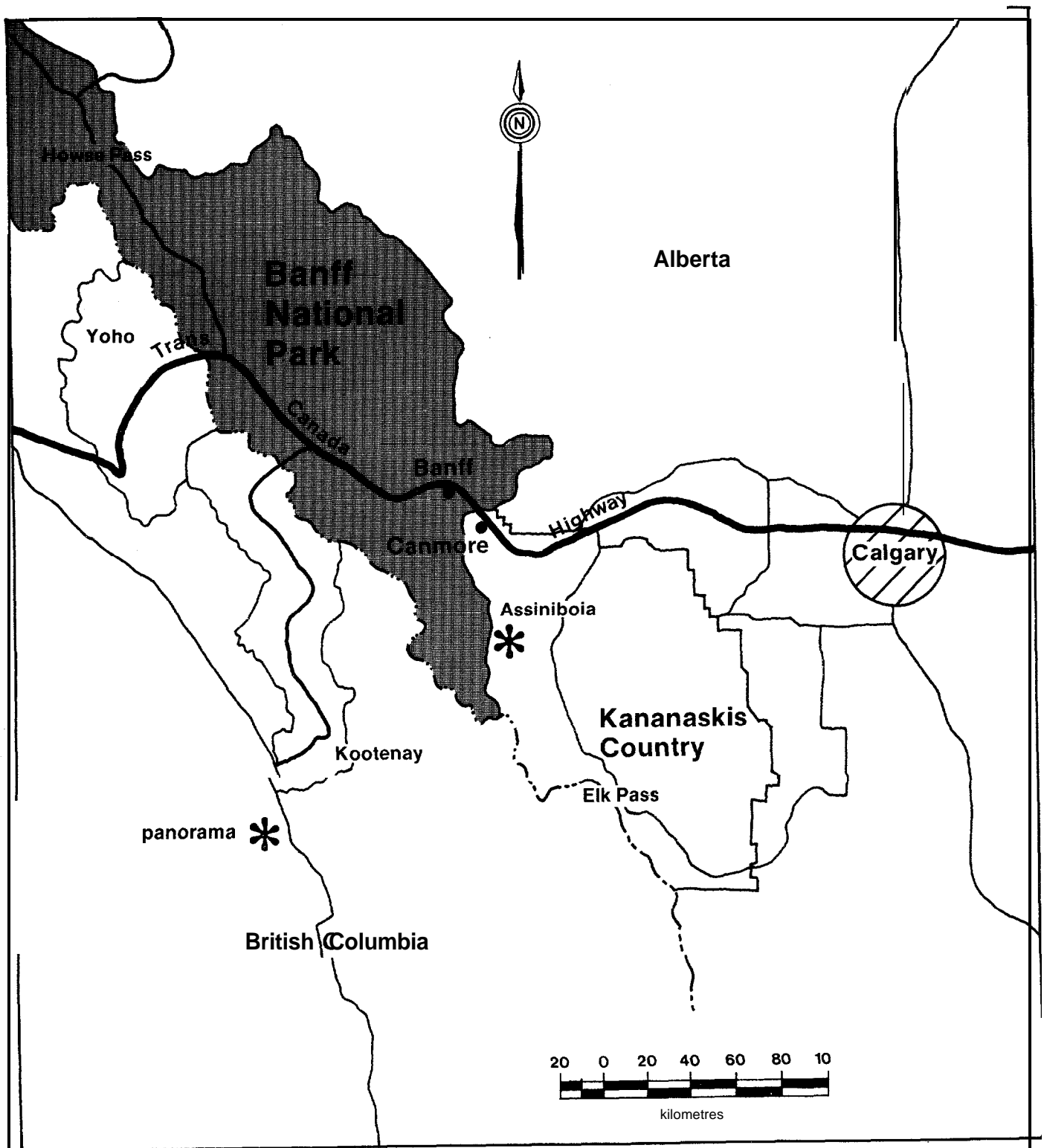


Figure 3



Banff National Park
and Surrounding Areas

Figure 4

was presented in the EIS). Thus, if some of the Park visitor traffic currently using the TCH were to make more use of the scenic Bow Valley Parkway (recently renovated and soon to be completely reopened for use) the congestion on the TCH beyond km 23 could potentially be reduced for this period of time. Similar observations were made by intervenors both at the information sessions and at the public meetings. Parks Canada expressed concern about the possible diversion of through traffic from the TCH to the Parkway.

Other intervenors pointed out, that by extending the Vermilion Lakes road to connect with the Bow Valley Parkway, increased capacity could be found along the section of highway from the Norquay interchange to km 23. As this option would involve adverse environmental impact in the vicinity of the Vermilion Lakes, other intervenors (from Banff) opposed this extension.

One alternative presented consisted of a comprehensive combination of many of these options. Included were a variety of spot improvements as discussed earlier, extension of the Vermilion Lakes road, a reduction of speed limits, a driver awareness program, a Vertebrate train line haul system for public transportation based in Canmore for use in the Park, provision for buses, parking in Canmore with higher parking fees inside the Park, a Park entrance fee discount for vehicles with high occupancy, elimination of parking at ski areas in the Park and alternative routes (e.g. Elk Pass) for some of the through traffic. The intervenor maintained that the feature of this proposal is that, while each of its components may not be capable of solving the problems which exist, together they may provide a solution. Aside from difficulties in implementing these measures in a short period of time, and in being certain they will work effectively, Public Works argued that these sorts of measures would not be acceptable and sufficient today.

However, the proponent agreed that over the next few decades similar measures (public transportation, shifts to other modes of transportation, curtailing driving activities) could indeed become acceptable and might be implemented. It was for this reason that an annual growth rate of 3.2% was used for long term planning purposes. It was noted that this rate is quite low compared with values which prevailed through the 1970's when the average annual growth rate was 7.4%. However tentative figures for 1981 indicate a 3.1 % growth rate over 1980.

The long term future growth rate is quite important. If indeed it is between 2% and 5 % per annum then, as noted by the proponent, the four lane highway will have adequate capacity to accommodate normal growth well into the next century. On the other hand intervenors

observed that conversely, if the annual growth rates are quite high (say around 10%) then the twinned highway could very well become as congested as the current highway by 1990. Before that time, more careful transportation planning would be required to implement the sorts of alternatives already discussed if six-laning is to be avoided. If this is to be the case, some intervenors argued, why not stop now and do a very detailed systems analysis of transportation alternatives before four-laning. There were also other intervenors who argued that even if the current project does proceed such planning studies are essential to prevent future problems. Evidence was presented at the meetings to indicate that such studies would need to involve Transport Canada, the governments of Alberta and British Columbia, Parks Canada, Public Works Canada, the railway companies and other agencies. They would also have to consider all options and park values.

The Panel concludes that while certain spot improvements, such as a widening of the road surface at key sites, could increase highway safety and modestly increase road capacity, the general problems of safety and congestion all along this section of the highway cannot be satisfactorily dealt with in this way.

The potential of public transportation, in the long run at least, is much greater. As noted in the Phase I Panel report, this mode is particularly suited for winter use when there are only a few major destinations (the ski areas). Over longer periods of time, given public acceptance of this mode of transportation in the Park, public transportation could play a major role in preventing the need for more than four lanes of highway in the Park. This would require some time and effort on the part of Parks Canada but the long term benefits may well be worth such effort. For the shorter term however, the Panel is not convinced, with one exception, that such efforts will be effective, or indeed that such efforts will be justified in order to prevent the impacts of four-laning. That is, public transportation is not presently a viable alternative except for winter ski traffic, in particular to Sunshine, where Parks Canada's limitation of parking spaces could require greater use of public transportation.

The alternative routes proposed outside of the Bow Valley are not presently viable alternatives. Howse Pass is rejected by Parks Canada and Elk Pass by Alberta government policy. The two alternative routes within the Bow Valley namely a new road south of the Vermilion Lakes or an extension of the present Vermilion Lakes road to connect with the Bow Valley Parkway would involve more significant environmental impacts than the Public Works proposal, as well as engineering problems.

Based on the evidence supporting the combination of alternatives presented, the Panel concludes that such a system will not respond satisfactorily to all of the current needs. The reasons for rejecting spot improvements, public transportation and alternative routes along most of the highway also apply to a combination which includes these elements. A combination of alternatives should however be considered in future Parks planning as the system has merits.

The Panel concludes that, because of existing traffic congestion problems and the absence of immediately available feasible alternatives, the need for twinning of the TCH from km 13 to the junction with the Bow Valley Parkway (km 23) has been demonstrated.

The Panel concludes that for the section of the TCH beyond km 23, use of the Bow Valley Parkway and public transportation to ski resorts, particularly Sunshine, could provide alternatives for Park user traffic and reduce traffic congestion on the TCH, at least in the short term. There is a need for Public Works and Parks Canada to evaluate the Parkway alternative before a judgment can be made on the need to twin from km 23 to km 27.

The Panel concludes that there is a need for further study beyond km 23 to establish an overall concept for transportation requirements covering the remaining sections of the TCH within Banff National Park. This would determine whether Public Works' proposal from km 23 to km 27 is compatible with overall highway requirements in the Park and in particular the relative priorities and benefits of any improvements that are determined as necessary.

The Panel also concludes as it did in the Phase I report that Parks Canada should actively promote the use of public transportation for visitors both to and from, and within, the Park because of its potential as a long term alternative to future TCH expansion.

Should the twinning proposal not proceed beyond the intersection with the Bow Valley Parkway the transition section from four lanes to two lanes should be determined in accordance with good engineering practices and the requirement of Park preservation. Although the designation "km 23" has been used in this report the exact location of the transition section may be either east or west of the Bow River.

2.2 PLANNING

A major concern expressed by some intervenors was that the project had not been studied in a broader context. This broader context took on different definitions

depending upon the intervenor's point of view. Parks Canada questioned the merit of the proposal compared to the possibility of alleviating higher priority traffic problems at other points on the highway to Lake Louise. The University of Calgary students presented the case that a transportation systems management approach could lead to different solutions. Many, including the proponent, foresaw a need for transportation planning within the Four Mountain National Parks and/or adjacent areas in British Columbia and Alberta in order to develop a long term strategy. The proponent and others, also saw a need for broad transportation planning to find alternatives to preempt a need for six-laning at a future date.

A particular concern expressed was that the proponent's proposal was a piecemeal approach to problem solving rather than an overall evaluation of the demands and a solution to satisfying those demands. Public Works maintained that twinning through the Park was being reviewed in phases because of environmental concerns and that if approval was granted on this phase it would proceed to investigate extension of twinning beyond km 27.

Some intervenors indicated that the proposal contravened the basic concept of National Parks, was not in keeping with National Park policy and would contribute to an increased demand for facilities in Banff National Park. Parks Canada made a statement to the Panel that its policy is to accommodate national transportation corridors in cases where there are no alternatives. Other than the question of alternatives the Panel did not hear conclusive evidence to illustrate that the project contravened current national, provincial, regional or Park plans and policies.

A planning program had been recently initiated for the Four Mountain National Parks, including Banff. There is no specific direction available at this time on future limits to activities which could affect demand on the highway. Some intervenors referred to the Kananaskis development and the winter Olympics and wondered about possible implications for Banff highway traffic use. The proponent noted that the Kananaskis development had been taken into account in its forecast and that the Olympics events would not have a significant impact on highway use.

For some intervenors the variety of development pressures on the Bow Valley requires stronger planning and/or management to deal with cumulative land use effects for transportation, wildlife and town activities. This requirement is of particular importance because of the limited area of montane zone available.

"Benefits. In our introductory remarks we stated, and we still feel, that the approach is a piece-meal one. We recognize the difficulty of co-ordinating a number of government agencies, particularly where levels of government are involved and where a number of provinces are involved. Co-ordination is essential for comprehensive planning. In order to ensure maximum societal benefits we have to take into consideration Park values. That is Parks Canada's mandate. We are not a transportation agency and from discussions at earlier meetings it seemed nebulous as to who has responsibility with accompanying authority to initiate the kind of action we deem necessary. We feel very strongly that a systems approach is required for transportation corridors linking Alberta and B.C. We hope the Panel will make a strong recommendation to the effect that such a study is required and that the multiple agency approach is essential."

P. Lange
Parks Canada

"I'm afraid that I have to answer that there is no planning being done in that area right now, long term planning, but I'd like to repeat something that was pointed out last night, and I don't want to shirk my responsibilities or pass the buck, as public servants are frequently accused of doing, but there's a fundamental political problem involved here in that there are three jurisdictions. There's the Province of Alberta, the Province of British Columbia, and the Federal Government and, within the Federal Government, there are at least two and maybe up to five or six jurisdictions involved."

R. Galarneau
Transport Canada

"All in all, the proponent has not brought forward any compelling argument that would indicate a decrease in travel demand resulting in a decline of the traffic growth trend from the current 10 to 13 per cent to 3.2 per cent annual growth. It may be a comfortable number to plan for, but will it materialize? What contingency plans should there be if it stays at the high level?"

G. Soly
Calgary

"Now, as to who is responsible for the overall transportation, the planning, it isn't Public Works. We have a very specific mandate, and that is to look after the Trans-Canada Highway through the National Parks, and from a highway transportation point of view that is really the limit of our mandate...."

D. Reid
Public Works

"The first observation of the review team was that the Environmental Impact Statement was not only an acceptable, but a well-written document. The best ecological information available had been incorporated and a good level of ecological knowledge was evident in the making of choices in location, design and route alternatives. The proponent must be commended for these achievements, and for incorporating many of the recommendations elucidated through the Phase I review."

A. Macpherson
Environment
Canada

"Yes, when we talked so extensively about wanting to know more about the possible terrain impact yesterday, this is directly related to our anxiety in seeing how the proponent is going to use techniques to minimize his impact on the montane vegetation, particularly the douglas forest part of it above the lakes, where the larger terrain impacts can be expected to go through that pristine country. The douglas fir portion is the most restricted part of the montane forest, and we want to be sure that every possible opportunity to minimize landscape disturbance of that particular zone in the montane forest is identified and implemented in order to not destroy any more of it than is absolutely essential."

B. Leeson
Parks Canada

"The problem faced in dealing with little pieces of development at a time, in isolation, such as the two phases of this twinning project, is that there is a failure to account for the cumulative impacts of the entire project. There is also a failure to account for environmental impacts from other sources but related to common areas. For example, the impact of twinning on the montane grasslands of this part of the Bow Valley may seem minor, but in concert with other current or projected land uses, may represent a more significant impact than implied by the EIS. If the areas of sensitive wetlands affected by the project are small, it must be **recognized** that they are limited in extent and continuation of the twinning will produce impacts throughout the Bow Valley."

M. McIvor
Federation of
Alberta
Naturalists

"Is not the purpose of the National Park to protect and preserve species of animals? I am not suggesting that every animal that crosses the entire length of the Trans-Canada Highway should be protected, but in a National Park, I think we, the people of this country, have the right to ask that all animals in a National Park be at least considered for protection, regardless of the threat to their population numbers or not."

J. Patterson
University of
Calgary

The Panel notes intervenors' points that acceptance of the project would place additional demands upon the resources and visitor facilities in Banff National Park and adjacent Parks. This project would require Parks Canada management to become more actively engaged in planning and managing the resources and land use to ensure the preservation of the resources in keeping with its mandate.

The Panel also notes that cumulative demands being placed upon the Park resources, could eventually reach a point, in certain locations, where the resources could no longer be maintained through management practices. Thus, the Panel foresees that there would be advantages to considering future proposals for expansion of human activities in the project area in a broader context.

The Panel concludes that the determination of relative priorities of, and alternatives for, various transportation options through the Rocky Mountains would be of assistance in long term Park and TCH planning. Transport Canada has the mandate for general transportation matters.

Agencies responsible for provision, approval, funding or overall planning of various transportation modes include Public Works, Transport Canada and provincial agencies while Parks Canada is responsible for managing the National Parks through which transportation routes run. The Panel concludes that there is a need for ongoing coordination between these agencies.

The project was designed to accommodate most existing land uses and circulation patterns and there was little comment on the impact of the project on adjacent land uses, interpretative facilities and traffic movements. The construction of the proposed interchange to replace the current traffic circle was considered an essential improvement by most parties even if the remainder of the proposal were deferred. The capability of the interchange to satisfactorily handle all traffic movements was not questioned. However, comments on its maintenance, particularly in winter were received. The proponent recognized the concern about the design and assured the Panel that the design would be subject to thorough model testing prior to proceeding with construction.

Several intervenors noted an improved access to the town along Banff Avenue which was shown on the model displayed at the public meetings, but not proposed in the EIS. None of the intervenors identified any environmental impact created by the expansion of this roadway to a four-lane urban standard.

The change to the **Norquay** interchange was noted by some intervenors as an improvement.

No major concerns were registered respecting the proposed access for the Big Horn Sheep Exhibit or the removal of access to the existing Mount Rundle Viewpoint. As an addition to the original EIS the proponent submitted a proposal to provide pedestrian access to the Mount Rundle Viewpoint from the Vermilion Lakes Road.

Some comments were received respecting the design of the interchange with the Bow Valley Parkway. It was pointed out that the proposed interchange did not accommodate all traffic movements which were currently permitted. The proponent's response indicated that the proposed design accommodates essential movements and with proper **signage** the highway users would not be inconvenienced.

Parks Canada requested recognition of the need for further financial resources to operate and maintain the new facility and related structures.

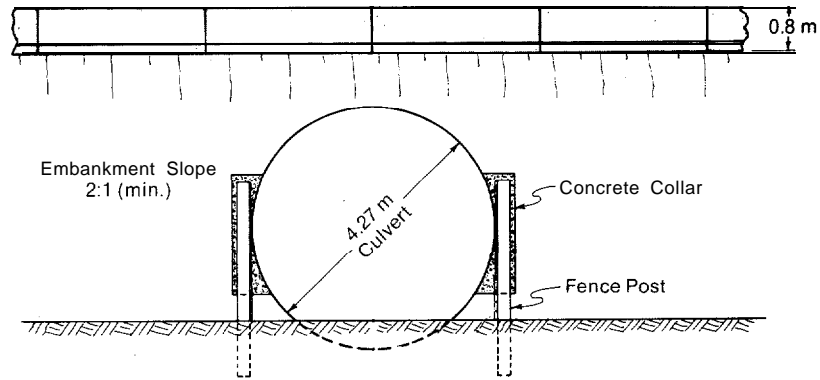
Parks Canada indicated at the public meetings that there may be a number of specific items which would arise at the detailed design stage and that they were confident that these issues could be resolved at that time. The Panel, in receiving evidence of the success of the committee structure established for Phase I (Section 2.7) is satisfied that there is a workable mechanism established to resolve issues that arise at the detail design stage in an environmentally satisfactory manner, within the scale of the impact which has already been identified.

The Panel concludes that the project would not detrimentally affect the adjacent land use, interpretive and traffic circulation needs. Any detailed problems could be resolved in an environmentally sensitive manner.

2.3 WILDLIFE

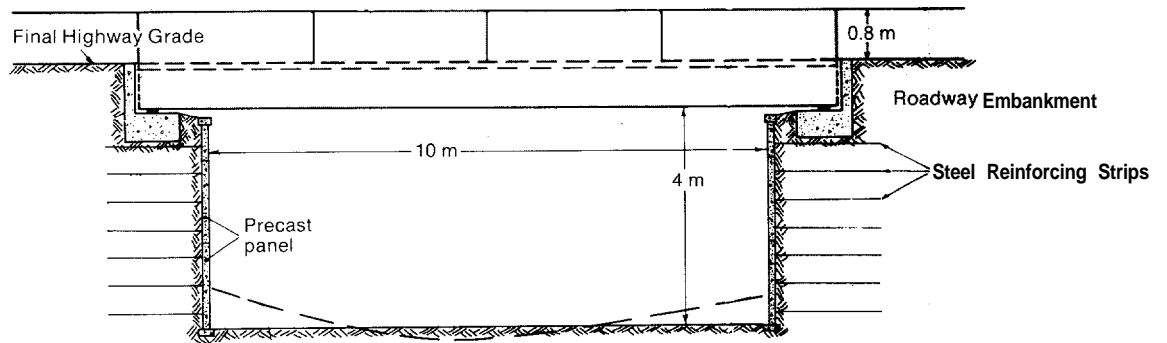
Environmental concerns of intervenors focused to a large degree on the impact of the project on wildlife. Two species which were considered the most likely to be affected were the sheep and the elk in the Bow Valley, because of possible loss of range. Road kills of wildlife were considered unacceptable and measures to reduce such kills were discussed. (It was estimated by the proponent that 30% of kills on the TCH in the Park take place from km 13 to km 27).

Evidence presented to the Panel indicated that the wildlife range immediately south of the existing highway near the Vermilion Lakes was of importance to the sheep in



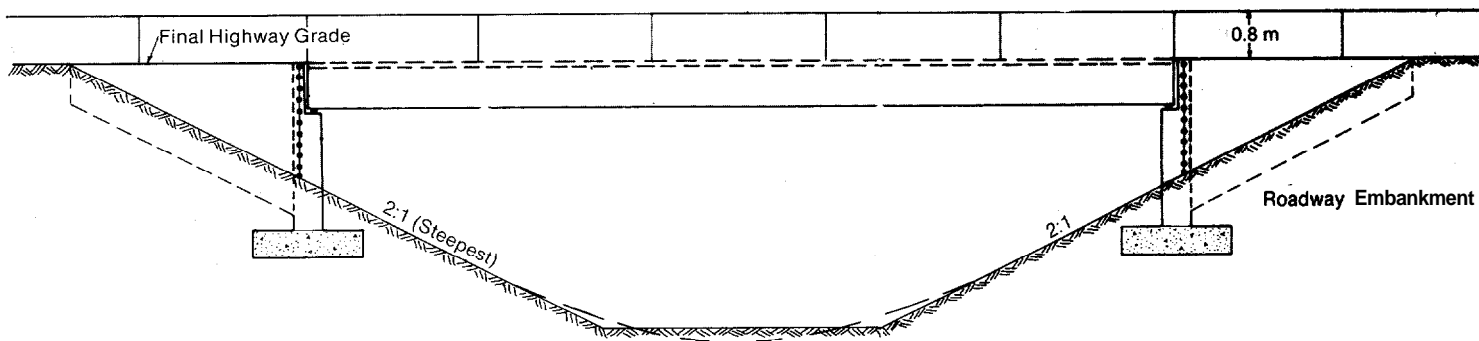
Culvert

Section A-A



Reinforced Earth

Section A-A



Open-Span

Section A-A

the spring because grasses there turned green earlier than at higher elevations. Such early growing vegetation is important to ewes and lambs. The project, if approved, would prevent sheep from reaching the lower range, unless mitigation measures were implemented. The proponent recommended an overpass to permit the sheep to cross the highway.

Some concern was expressed about the reduction of grasslands for elk should the project be approved and carried out. The Panel was informed that the reduction would be about three percent and that at present elk are under-utilizing the available range. However, the elk population is likely to increase if the proposed mitigation measures are implemented and wildlife kills diminish.

The possibility of habitat modifications elsewhere in the Park as a compensation measure for terrain lost to wildlife uses was discussed at the meetings. Suggestions to remove existing fencing at the Buffalo Paddock and the golf course were made. This would assist animal movement throughout the Bow Valley.

The proponent's proposal to mitigate road kills through fencing the highway, as in Phase I, received general approval, though a number of concerns were raised. Alternatives to fencing such as depression barriers were suggested. Intervenor stressed that an effect of fencing would be to reduce the availability of roadside vegetation. Additional concerns were to locate the fence in a manner to minimize visual disruption of highway travellers, to design the fence to allow small mammals through and to provide easy maintenance. An important design concern is the termination of the fence in a manner that will impede entry to the highway by ungulates. Public Works identified a number of options but these require further evaluation.

Intervenor suggested that mortality of small animals crossing the highway divided by a concrete barrier median could be substantially reduced by providing appropriately sized holes through the barrier.

While fencing will be an effective barrier to most movements of large animals across the highway, occasionally an animal may get on the road and must have a means of escape. The proponent informed the Panel that one-way gates would be placed in the fence at intervals on average of one per kilometre to allow the larger animals trapped on the highway to escape. Concerns were expressed about winter use of these gates and their effectiveness for smaller animals such as fawns. Parks Canada indicated it would continue its research in order to resolve these problems.

To permit wildlife crossing of the highway, Public Works committed itself to install five underpasses, one over-

pass and either another overpass or an underpass. The need to design the over and underpasses in a manner which would facilitate animal use was discussed. Open span structures with earth aprons were considered to be the best underpass design, but most costly. Other options for underpasses include a reinforced earth structure, and a culvert (Figure 5). An experimental large diameter culvert underpass is being installed at km 4 (Phase I).

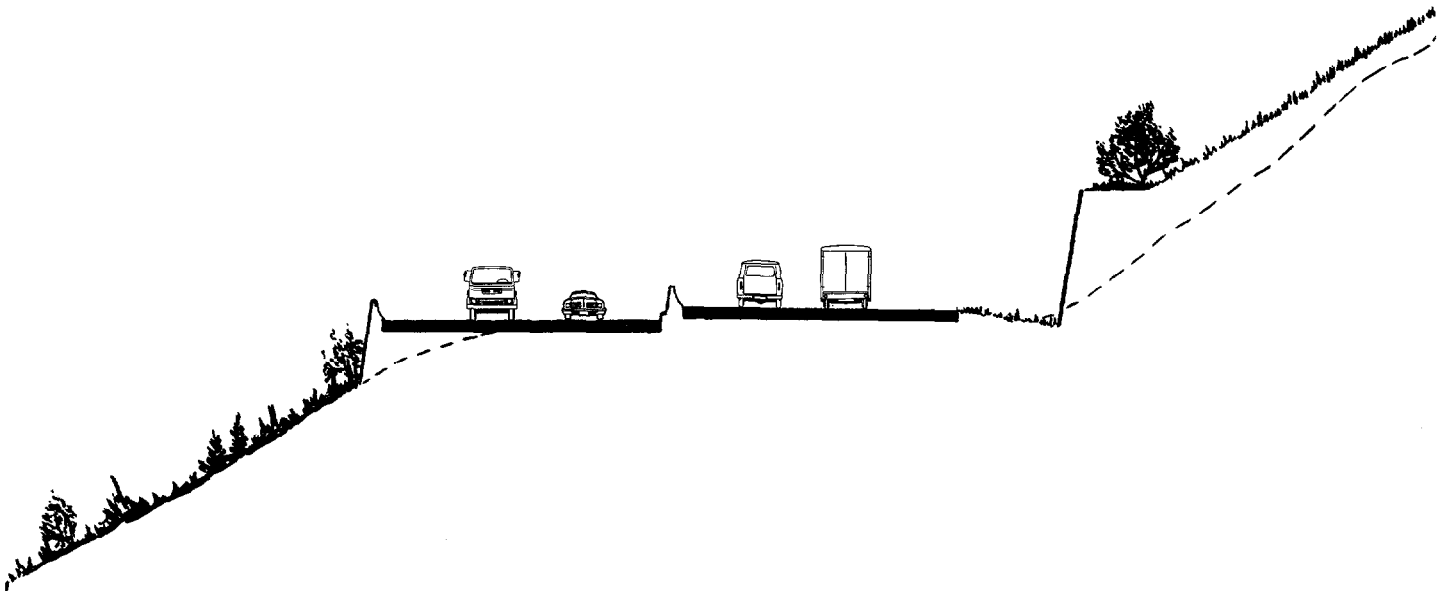
Under and overpasses for wildlife use have not been tried in Canada, although underpasses have been used successfully in the Western United States. A number of intervenors recommended that because of the novelty of the technique and because of the wider range of species involved in the Park, an evaluation of their effectiveness in Phase I be completed before proceeding with them in Phase II. Public Works noted the use of existing bridges by ungulates and Parks Canada was confident that with conservative design the measures would work.

The Panel concludes that the impacts on wildlife of the proposed highway location and design could be contained within acceptable limits provided that proposed mitigation measures are implemented sensitively and effectively. However, further study is required to evolve the best design for the termination of fencing and, as experience is gained, some modifications to the over and underpasses may be necessary.

The Panel concludes that fencing along both sides of the highway, together with one-way gates and properly located and designed over and underpasses would have to be incorporated in the design as the major factor to reduce road kills, improve public safety and facilitate animal movements between the valley floor and the slopes to the north. The final design and locations of the fences, one-way gates and over and underpasses would have to be subject to the approval of Parks Canada.

It is noted that monitoring and evaluation of the effectiveness of Phase I mitigation measures should be initiated as soon as possible by Parks Canada so that design or other changes indicated could be incorporated where possible in Phase II. Public Works should be responsible for the redesign, costs and construction of changes to any mitigation measures. These conclusions also apply to mitigation of other environmental impacts. Further conclusions respecting responsibility for mitigation measures, monitoring and evaluation are contained in Section 2.7.

The Panel concludes that where a concrete median barrier is constructed, a reasonable number and size of openings would have to be provided to assist small animal passage across the highway.



Slope Treatment
in Vermillion Lakes Area

Figure 6

If the project were not to proceed beyond km 23, wildlife mitigation measures would be required to deal with existing wildlife/vehicle accidents at km 26 near Healy Creek.

The Panel reaffirms the point noted in its report on Phase I that there is a need for an overall management plan for large animals in the Park that will take into account the incremental effects of this project on habitat and movements, and of past and future projects which have affected or may affect the species concerned. Habitat modification would be a component of this plan.

The Panel concludes that there is a need now to solve the wildlife kill problems on this section of highway and that the proposed mitigation measures are the only method with assurance of success. Further research is desirable however to determine if less drastic measures could be successful for future use elsewhere.

2.4 TERRAIN, VEGETATION AND AESTHETICS

Various inter-related terrain and vegetation issues were raised. These concern the montane zone in the Park and include the impact on the south facing slopes above the Vermilion Lakes, the requirement for borrow pits within the Park, the removal of areas including grasslands used for ungulate feeding, the prospects for revegetation and intrusion into wetlands areas.

The Panel was informed that there had been extensive biophysical surveys conducted within the Park area and that the figure of approximately 190 square kilometres was now recognized as the area of montane zone within the 6358 km² area of Banff National Park. The montane zone was described by Environment Canada as being land in areas at less than 1550 metres elevation, having warm summers compared to the rest of the Park and intermittent snow cover due to Chinook effects. Being relatively warm it tends to have high productivity of vegetation and produces more food for wildlife.

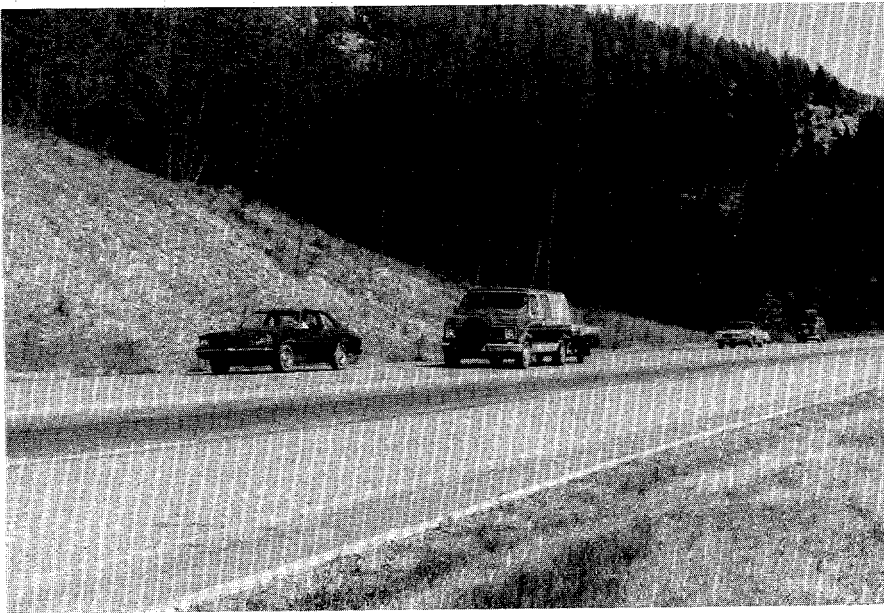
Occupying less than three percent of the area of Banff National Park (3/4 of that being in the Bow Valley) the montane zone is viewed by Parks Canada as constituting a "special and uncommon heritage natural resource". Moreover, while the montane zone generally is valued, the most important components, namely the Douglas fir forest, the montane grassland and the wetlands, represent but a small part of the montane zone.

It was estimated by Public Works that the highway would affect 57 hectares of land including 18 hectares of old pits and rock area. Environment Canada main-

tained that this would increase the percentage of the montane zone in the Bow Valley modified by human activity from 7.6% to 8.4%. The significance of the montane zone was acknowledged by Public Works which provided information that sensitive habitat areas eliminated would be in the order of 0.5 hectares of douglas fir, 3.0 hectares of grassland and 0.4 hectares of wetland, for a total of approximately 4 hectares. The Panel was informed by -Public Works that steps had been taken to minimize loss of montane zone, for example by routing to avoid the wetlands area and by making detours within the construction area of the Minnewanka interchange so as to avoid impact on the surrounding grassland.

One further reason for concern with impacts on the montane zone is that the highway twinning is by no means the only project which could reduce the availability of montane zone for animal habitat. Other transportation projects as well as projects associated with Banff town are proposed in the montane zone area.

A particular area of concern is the impact on the south facing slopes above the Vermilion Lakes. There are several cuts in this region made for the existing highway, many of them very poorly revegetated after twenty years. Many of these will be enlarged and new cuts made to accommodate the extra lanes. A variety of concerns arise. First some of this land is covered with the valuable Douglas fir stands. Secondly, there is some concern with the possibility of seepage problems resulting in erosion of the slope. (A much larger south facing slope with serious seepage problems has recently caused serious environmental and aesthetic problems at Lake Louise.) Thirdly, the cuts into this slope are intended to provide needed fill in the area (a balanced cut-and-fill is expected between the Norquay interchange and the Bow River) and it is noted that the suitability of the material for fill is not verified. Parks Canada insisted that further geotechnical investigations be carried out and noted that innovative design solutions could be required to reduce impacts to an acceptable level. In this way surprises (with possibly serious environmental problems) can be avoided. Finally, this south facing slope is expected to prove very difficult to revegetate and several attempts may be necessary. Inasmuch as this slope is important sheep habitat this revegetation difficulty, taken with the loss of land due to construction, is particularly important. Public Works noted that the use of retaining walls at the base of slopes would help to lessen the amount of cuts into the hill, that the material was not primarily slip-prone silt and that the current largest cut near km 19.5 could have its slope reduced (with a retaining wall) which might allow more revegetation success (Figure 6).



1971-1972

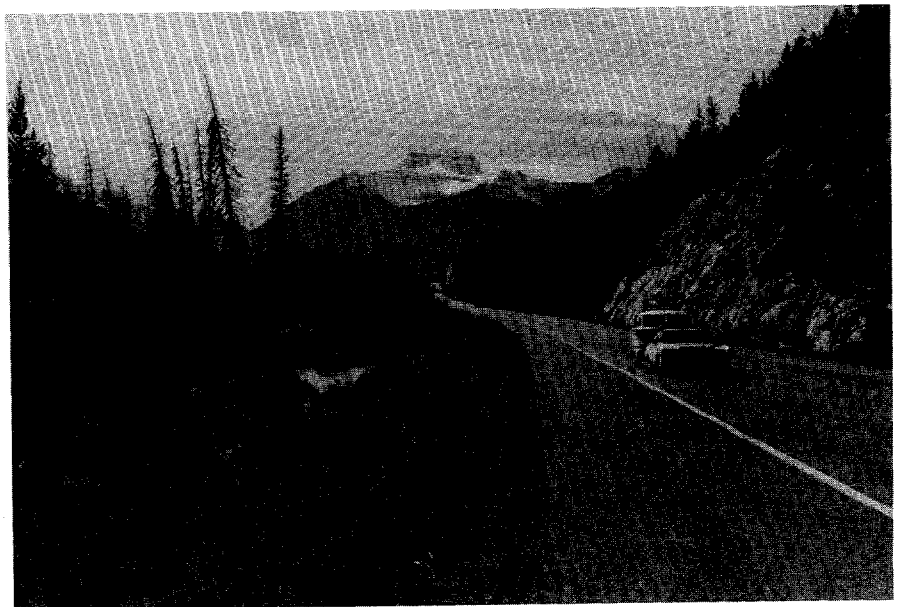
1971-1972

During the summer of 1971, the area was visited by a number of people, including a group of about 10 people who were on a field trip. They were looking for a place to set up a camp. The area was found to be a good place for a camp, and the group stayed there for a few days. The area was found to be a good place for a camp, and the group stayed there for a few days.

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Impacts on wetland vegetation are also associated with this project. Impact on the Vermilion Lakes area is not foreseen except for the Vermilion Lakes road just southwest of the Norquay interchange where 0.4 hectares of wetland sedge communities will be eliminated. In addition 2.0 hectares of wetland sedge communities on the south side of the existing road between Forty Mile Creek and the Norquay interchange will be replaced with the new highway. This area was also identified by the proponent as being special and a "seepage woodland area, rare vegetation type; potential habitat for rare plants such as orchids". The alternative of constructing the new lanes north of the existing highway in this section was also mentioned in the EIS and at the public meetings. This could reduce the impact on the wetlands but would have greater impact on the grasslands.

The issue of borrow pits within the Park was also raised. The project is likely to require about 100 000 m³ of borrow and about 130 000 m³ of aggregate. The latter is likely to come from the Cascade Pit just north of the Minnewanka interchange. There seems to be little doubt about the availability of suitable gravel from that source. The pit is currently in use so that although reclamation will be required, there were no objections to the use of this source. The borrow to build from km 23 to km 27 is to come from pits north of Sunshine Road (Healy Creek pits) which were previously used for the TCH construction. While Public Works is quite confident that this source will contain adequate material, Parks Canada requested and Public Works agreed that further studies are required to prove that the pit has enough material and to determine the precise area to be impacted. This was considered important again to avoid surprises such as an urgent need for borrow which might need to come from a much less suitable area. The 100 000 m³ estimated to be required from the Healy Creek pits was estimated to be likely to spread over 5 to 6 hectares because of non-uniformity of material. The development of a reclamation plan was proposed. This would involve revegetation to improve ungulate habitat.

Another area of concern is the impact on the montane grasslands in the vicinity of the Minnewanka interchange. Approximately 1.5 hectares of high quality grassland which is heavily used by ungulates, will be lost to the interchange. This includes the loss of a "special area" identified by the proponent as being the "best grasslands along this part of the highway".

The need for revegetation of exposed surfaces (cut and fill slopes, borrow pits) was another issue discussed. Public Works referred to their experience in revegetation along the Bow Valley Parkway. The techniques for revegetation were discussed including handling, storage and compaction of top soil. Parks Canada has undertaken research on the use of native species in revegeta-

tion and has developed several varieties of seed mixes appropriate to different types of surface. However, seed for these native species is limited so agronomic species would still play a major role. This revegetation is made difficult by calcareous subsoils which are detrimental to plant growth if they become mixed with the topsoil, so very careful handling and compaction of topsoil is required. In addition the hot sun and dessicating winds make the retention of moisture very difficult on these slopes. Parks Canada stated that the priorities for revegetation were: first the control of erosion, second aesthetics, and third the reintroduction of native species. It also noted that complete success in revegetation could be doubtful in particularly sensitive areas.

Aesthetic concerns were raised less frequently than during the Phase I public meetings. While one environmental group complimented Public Works on its design in the Vermilion Lakes area others expressed concerns about visual aspects either for drivers, or those viewing the highway from elsewhere in the Park. Public Works considered that in adopting a curvilinear alignment it was improving the visual appeal of the highway for the driver.

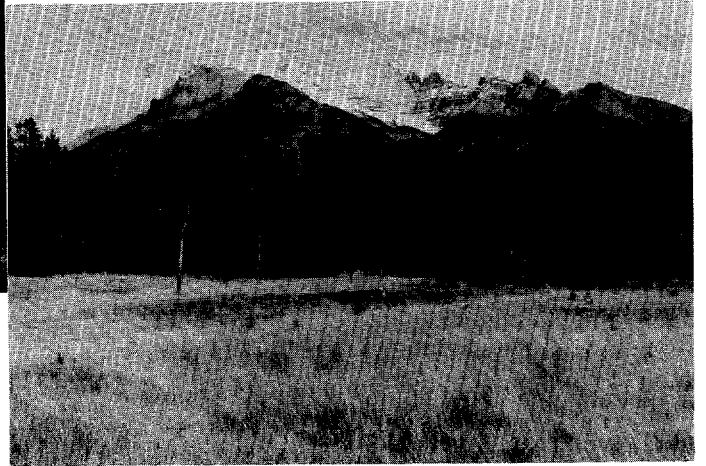
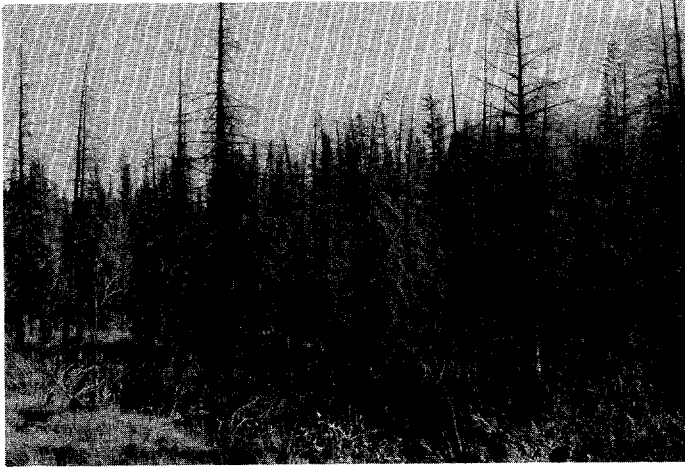
The Panel concludes that reclamation of disturbed areas would require careful investigation and that appropriate mitigation measures would have to be incorporated into designs before they are finalised.

Special attention would have to be given to the slopes above the Vermilion Lakes. Detailed investigation of seepage areas would be necessary to identify potential erosion zones and to design appropriate mitigation measures. In addition care would need to be taken to minimize the potential loss of Douglas fir stands and repeated efforts might be required to revegetate. The use of retaining walls could be an appropriate method of dealing with some of the above impacts, provided aesthetic considerations are satisfied.

With regard to revegetation, the best state of the art techniques would have to be utilized. The Panel notes that while complete success is not assured, any **revegetation** measures would have to be completed to the satisfaction of Parks Canada.

In the event that the Healy Creek borrow pits are used, further investigation prior to construction would be required to develop a plan for eventual improved **utilization** of this area by ungulates.

Although beyond km 23 the need to replace Parkland with highway is still in question, the Panel is generally satisfied that the impact of the proponent's proposal on the montane zone has been minimized. Certain minor additional measures would have to be investigated



before the alignment of the highway is finalized. These involve further investigation of the feasibility of retaining walls to reduce encroachment in the Vermilion Lakes area and the possibility of putting the additional lanes on the north side of the existing highway to avoid the wetlands between Forty Mile Creek and the Norquay Interchange. Plans to identify and avoid or salvage any rare or endangered species would have to be made at that time.

2.5 FISHERIES AND HYDROLOGY

The section of the TCH under review crosses Whiskey Creek (km 14.5), Forty Mile Creek (km 16), Edith Creek (km 22), Five Mile Creek (km 23), the Bow River (km 23.5), and two unnamed creeks at km 16.5 and km 17. There are also wetlands and springs between Forty Mile Creek and the Norquay interchange, the Vermilion Lakes to the south of the route between the Norquay interchange and the Bow River, and Healy Creek south of the route between the Bow River and Sunshine.

According to the EIS there are few fish in these waterbodies in the vicinity of the highway (with the exception of the two unnamed creeks at km 16.5 and km 17) but downstream the Bow River, the Vermilion Lakes and Forty Mile Creek do contain fish populations worthy of protection.

A variety of construction impacts are identified by the proponent in the EIS, including sedimentation, water contamination, culvert installation and other in-stream activities. In a submission to the Panel the proponent stated that "the protective measures described in «the EIS» will broadly apply to all systems along the TCH route in order to ensure that all impacts resulting from the project will be low. The protective measures are necessary to minimize impacts both on fish populations and habitat features including water quality in downstream locations".

Parks Canada and Environment Canada representatives at the public meetings were satisfied with this commitment by the proponent. Parks Canada noted that Public Works' commitment was backed up with encouraging achievements in managing fish impact situations on Phase I of the project, in particular the Chinaman Creek excavation and the contractual control over timing of stream crossings to minimize sedimentation.

Additionally, Parks Canada and other intervenors raised the issue of crossing the wetlands between Forty Mile Creek and the Norquay interchange. Public Works indicated that, with the present design, it was proposed to lower the water level in order to construct the highway. This lowering of the water table would influence a

considerable area in the vicinity but as the beaver dams causing the high water level are quite a recent phenomenon, the lower water level would really only reproduce a situation which existed five or ten years ago. Nevertheless, the beaver and the wetland vegetation in the area would be affected. These changes are very much like the natural fluctuations which would occur in the area and the beaver would, according to both the proponent and Parks Canada, recolonize elsewhere and may return after construction is complete. Parks Canada's concern was primarily for the fish resources in the two unnamed creeks at km 16.5 and km 17. Parks Canada indicated a need to preserve or restore these main channels in order to maintain the fish habitat in these streams.

The Panel concludes that with the careful application of mitigation measures (such as those identified in the EIS), the residual impact on fish and water resources, including sedimentation effects, would be well within acceptable limits. The Panel also concludes that, in consultation with Parks Canada, the proponent would have to develop an appropriate design to protect the fish in the two unnamed creeks at km 16.5 and km 17.

2.6 CONSTRUCTION SCHEDULE

In the EIS the proponent has proposed a seven year construction schedule. The most optimistic date for the provision of funds would be for the 1983-84 fiscal year thus setting the completion date of the project at 1990. However, a paved surface would be provided at the end of 5 years (1988). Public Works stated that the placing of the final pavement in 1989 and 1990 would cause minimal disruption to the travelling public.

Most intervenors felt that the construction time in accordance with this schedule was too long and that it would result in unacceptable disruption. This was the only major socio-economic impact discussed at the public meetings. The proponent submitted a revised schedule at the public meetings which cut one year off the total construction time. This would mean that a paved surface would be provided by 1987 instead of 1988, with completion of final paving by 1989.

A few intervenors felt that the Minnewanka interchange should have been included in Phase I and construction of it should proceed immediately. As mentioned in Section 2.3, some intervenors believed that Phase II, west of the interchange, should be delayed so that the mitigating measures on Phase I can be monitored and evaluated before proceeding further. From a construction point of view a delay of construction west of the interchange would present a number of problems that could not easily be handled. The present design for a

depressed interchange will result in approximately 400 000 m³ of material that would be used for construction of the highway farther west. If construction between the Minnewanka and Norquay interchanges were delayed double handling of this material would be necessary. Stockpile areas would be required outside of the Minnewanka interchange limits which would cause environmental damage to adjacent terrain.

The Panel concludes that a shortened construction period would reduce disruption in the Park, provided environmental protection scheduling requirements are respected. The overall socio-economic impact of a shorter construction schedule would be positive.

2.7 RESPONSIBILITY FOR MITIGATION MEASURES, MONITORING AND EVALUATION

The Phase I Panel report recommended that the project be allowed to proceed subject to the following conditions (See also Appendix B).

- “(4) The best possible state-of-the-art techniques be utilized to ensure that design features result in an aesthetically pleasing highway. Such matters as type of fencing and proximity to the highway must not only serve their intended purpose (to keep ungulates off the highway) but also meet high aesthetic standards to preserve park enjoyment for visitors.
- “(8) A Committee be constituted as a mechanism to ensure that highway design and construction meet the high environmental and aesthetic standards necessary in the Park. Membership would include representatives from Public Works Canada, Parks Canada and the Environmental Protection Service of Environment Canada, and others by invitation. Its terms of reference should include matters relating to:
 - (i) facilitating design approvals;
 - (ii) environmental standards and practices;
 - (iii) aesthetic standards;
 - (iv) further studies and resulting mitigation requirements;
 - (v) special environmental conditions in contracts;
 - (vi) ensuring that the conditions contained in recommendation 5.1 of this report are implemented.
- “(9) The Committee referred to in condition (8) also be responsible for ensuring the implementation of

those studies and mitigation and enhancement measures that were identified by the proponent in the EIS and at the public meetings consistent with condition (4) above.

- “(11) That the proponent designate a suitably qualified person, reporting to the Project Manager, with sole responsibilities as Environmental Coordinator for the project. Such a person will serve as the day-to-day contact for Park Wardens and other inspectors and ensure that construction operations are carried out by the contractors using good environmental practices and in accordance with the agreements reached by the Committee. The Environmental Coordinator should regularly submit reports to the Committee on matters related to the degree to which environmental requirements are being met during construction operations.”

In a detailed submission to the Panel, Parks Canada advised that a committee structure had been established prior to the start of construction on Phase I. In total there are six committees of which one is a coordinating Policy Committee with representatives from Public Works, Environment Canada and Parks Canada.

The Policy Committee, to ensure that the policies set by them are met, appointed a Senior Committee and four sub-committees (Environment, Design, Construction and Public Relations). Again Public Works, Environment Canada and Parks Canada make up the membership of the Senior Committee which co-ordinates the work of the four sub-committees and makes decisions relative to the project with the exception of those of a policy nature. On occasion and as required the Senior Committee has resolved issues referred to it when a decision could not be reached at the Sub-Committee level.

Public Works, Environment Canada and Parks Canada are represented on all six committees.

Public Works recruited the former Chief Warden of Banff National Park as Environmental Coordinator. Parks Canada stated that the Coordinator has proven to be effective and efficient in monitoring the construction that has been carried out so far, as well as considering the plans at the design stage, and making appropriate recommendations. The description of the duties of the Environmental Coordinator was tabled at the public meetings.

In summary, Parks Canada declared that they have every confidence in the team in place to ensure that environmental concerns are met and that proper monitoring is carried out for the first 13 kilometres of construction.

"Other concerns may be classified as construction impacts: the effectiveness of environmental monitoring on contractor performance regarding construction standards and pollution, and traffic movement and safety during construction. We fully understand the importance of the Trans-Canada Highway to the national economic interest just as we feel the preservation of the biological integrity of the Bow Valley in this National Park is in the national interest. We believe it is in the national interest to see that the highest possible standards and environmental safeguards have been instituted, adhered to, and proven effective before tying in to Phase II."

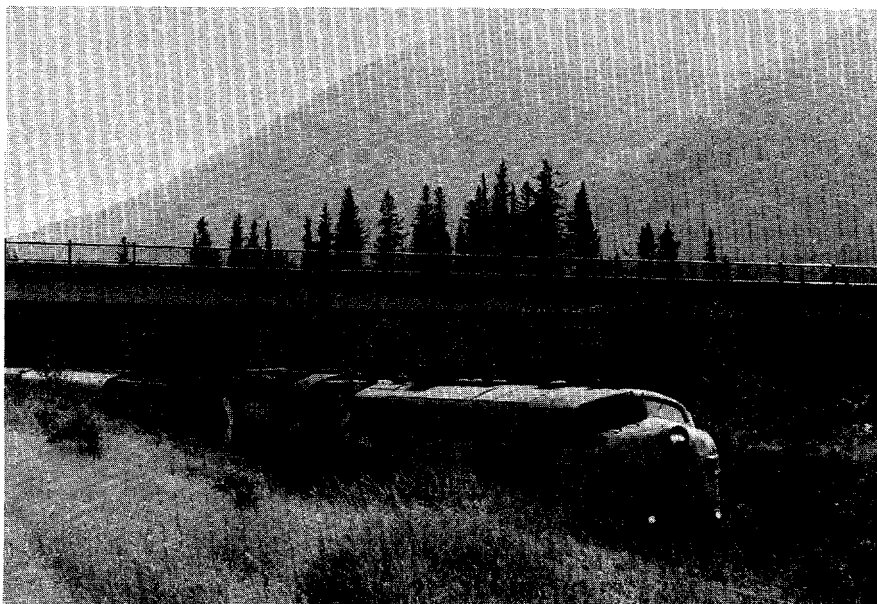
G. Wilkie
Bow Valley
Naturalists

"My name is Bill Smythe and I have a question regarding your time schedule on this. When one sees from km 13 to the Sunshine turnoff taking very nearly seven years to build and thinks back to the present two-lane Trans-Canada from the traffic circle to Revelstoke, probably 140 out of that 180 miles was built in just over six years. Are there advantages to spreading it out this long, or technical reasons, or have you not progressed in the last 25 years?"

W. Smythe
Banff

"Well, I think that we have a concern obviously because we asked for a shortened period of construction. But we do feel very strongly that there should be a gap between the two so that - perhaps our prime concern would be the environment, the animals, and what happens for the sake of the tourists to a Park that can be desecrated by construction going on continually. We would like to see that the first phase be done and a pause so that we can see the effects of the twinning, but we have said that in conjunction with having a traffic circle to Banff."

P. Boswell
Banff /Lake Louise
Chamber of
Commerce



Parks Canada and Public Works suggested that it would seem appropriate to maintain the same Committee structure if any further twinning is approved. Some intervenors doubted whether sufficient authority and manpower existed to effectively monitor construction. Parks Canada believed that if an accelerated program was undertaken more people might be required for environmental coordination. The authority for the Coordinator position was regarded as adequate by the incumbent.

Plans for monitoring are the responsibility of the Environmental Subcommittee. By mutual agreement Public Works is now responsible for the first year of monitoring the effectiveness of underpasses and fencing and Parks Canada would do it thereafter. Concern was expressed as to whether the present monitoring of Phase I was being done for a long enough period to judge results, especially for the experimental culvert underpass at km 4. Suggestions were made to speed up Phase I construction to get results quickly. A concern was also expressed as to whether sufficient funds would be available for Parks Canada to monitor Phase II, and as to who would be responsible for making changes identified as necessary.

Parks Canada considered that the issue of monitoring was of high enough priority that resources would be committed to do a reasonable job of monitoring and that they would also be responsible for changes of a maintenance type. Major modification to structures would, however be a Public Works responsibility.

Public Works considered that Phase I construction could not be substantially speeded up but that there would be sufficient time to obtain the results of monitoring for inclusion in Phase II. With regard to the experimental underpass, however, Parks Canada doubted that there would be sufficient information to warrant use of such a structure in Phase II.

The Panel concludes that experience with Phase I has indicated that the committee structure established has

been able to cope successfully to date with the stringent requirements of highway design and construction in a National Park setting. Public Works and Parks Canada should be commended for this cooperative effort.

The Panel concludes that the role of the Environmental Coordinator should be continued if Phase II proceeds and, that his authority is sufficient for the task, given the lines of communication that exist. However, if construction were to be significantly accelerated, consideration should be given to assigning additional resources.

Because of the special nature of the proposed mitigation measures the Panel concludes that a formal evaluation report would be required, as an integral part of the project. The evaluation should use the results of monitoring to assess the effectiveness of the mitigation measures and identify any improvements necessary to remedy problems noted. The evaluation should be documented in a formal written report.

The Panel also concludes that reports would need to be prepared on an annual basis during the construction period and include information on the manner in which the Panel recommendations and the proponent's commitments are being implemented.

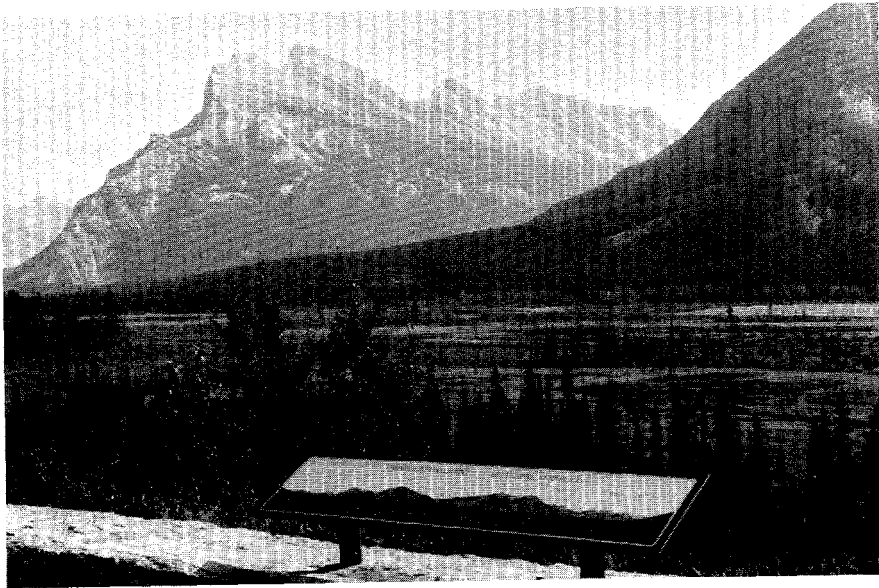
Because of the possible applicability of the mitigation measures to other situations and general interest in the National Park, the evaluation and annual reports should be made public.

The overall responsibility for monitoring should rest with Parks Canada but the resources required for this work should be regarded as an integral part of the cost of the construction project.

The Panel concludes that a Committee structure similar to that used for Phase I would be appropriate for Phase II. In addition the Senior Committee would be responsible to ensure that evaluation and annual reports are prepared for all works underway on the TCH.

CHAPTER 3

SUMMARY OF MAJOR CONCLUSIONS



The Panel reached a number of conclusions, many of which were considered major and are listed in this chapter.

The Panel concluded that:

- 1) the construction of a new interchange to replace the current Minnewanka traffic circle is considered an essential improvement, but that model testing should be conducted and the design adjusted, if necessary, to ensure a minimum of snow clearance problems;
- 2) the alternative routes proposed outside of the Bow Valley are not presently viable alternatives. Howse Pass is rejected by Parks Canada policy and Elk Pass by Alberta government policy;
- 3) the two alternative routes within the Bow Valley, namely a new road south of the Vermilion Lakes or an extension of the present Vermilion Lakes road to connect with the Bow Valley Parkway, would involve more significant environmental impacts than the Public Works proposal, as well as engineering problems;
- 4) certain spot improvements, such as a widening of the road surface at key sites, could increase highway safety and modestly increase road capacity but the general problems of safety and congestion all along this section of the highway cannot be satisfactorily dealt with in this way;
- 5) public transportation is not presently a viable alternative except for winter ski traffic, in particular to Sunshine;
- 6) the use of public transportation, for visitors both to, from and within the Park should be actively promoted by Parks Canada because of its potential as a long term alternative to future TCH expansion;
- 7) a combination of alternatives such as spot improvements, public transportation, etc. will not respond satisfactorily to all present needs but should be considered in future Parks planning as the system has merits;
- 8) because of existing traffic congestion problems and the absence of immediately available feasible alternatives, the need for twinning of the TCH from km 13 to the junction with the Bow Valley Parkway (km 23) has been demonstrated;
- 9) for the section of TCH beyond km 23, use of the Bow Valley Parkway and public transportation to ski resorts, particularly Sunshine, could provide alternatives for Park user traffic and reduce traffic congestion on the TCH, at least in the short term. There is a need for Public Works and Parks Canada to evaluate the Parkway alternative before a judgment can be made on the need to twin from km 23 to km 27;
- 10) there is a need for further study beyond km 23 to establish an overall concept for transportation requirements covering the remaining sections of the TCH within Banff National Park. This would determine whether Public Works' proposal from km 23 to km 27 is compatible with overall highway requirements in the Park and in particular the relative priorities and benefits of any improvements that are determined as necessary;
- 11) should the twinning proposal not proceed beyond the intersection with the Bow Valley Parkway the transition section from four lanes to two lanes should be determined in accordance with good engineering practices and the requirement of Park preservation. (Although the designation "km 23" has been used in this report the exact location of the transition section may be either east or west of the Bow River.);
- 12) acceptance of the project would place additional demands upon the resources and visitor facilities in Banff National Park and adjacent Parks. This project would also require Parks Canada management to become more actively engaged in planning and managing the resources and land use to ensure the preservation of the resources in keeping with its mandate;
- 13) cumulative demands being placed upon Park resources, could eventually reach a point, in certain locations, where the resources can no longer be maintained through management practices. Thus there would be advantages to considering future proposals for expansion of human activities in the project area in a broader context;
- 14) determination of the relative priorities of, and alternatives for, various transportation options through the Rocky Mountains would be of assistance in long term Park and TCH planning;
- 15) ongoing coordination is required between the agency responsible for managing National Parks and agencies responsible for provision, approval, funding or overall planning of various transportation modes. The agencies responsible include Parks Canada, Public Works, Transport Canada and provincial agencies;
- 16) the project would not detrimentally affect the adjacent land use, interpretive and traffic circulation needs. Any detailed problems could be resolved in an environmentally sensitive manner;
- 17) the impacts on wildlife of the proposed highway location and design could be contained within

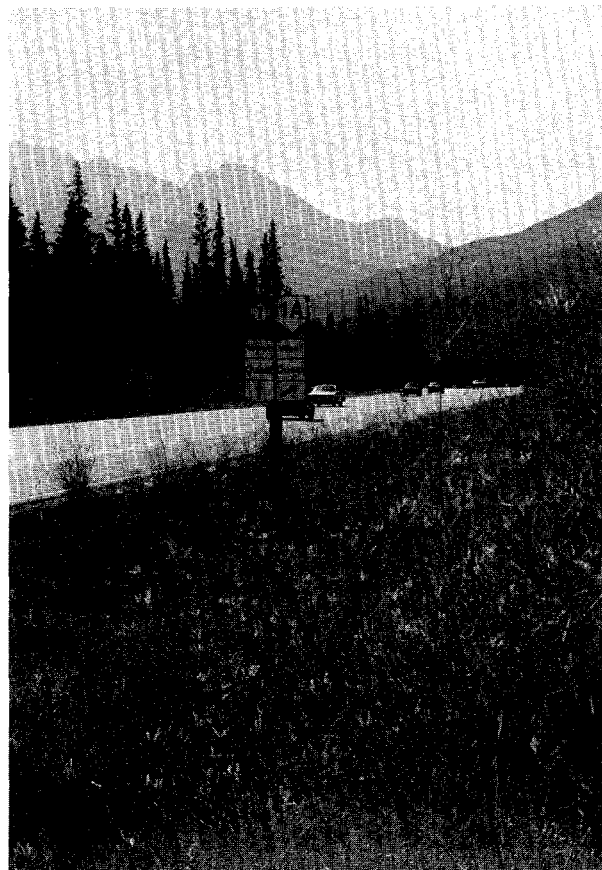
acceptable limits provided that proposed mitigation measures are implemented sensitively and effectively. However, further study is required to evolve the best design for the termination of fencing and as experience is gained, some modifications to over and underpasses may be necessary;

- 18) fencing along both sides of the highway, together with one-way gates and properly located and designed over and underpasses would have to be incorporated in the design as the major factor to reduce road kills, improve public safety and facilitate animal movements between the valley floor and the slopes to the north;
- 19) the final design and locations of the fences, one-way gates and over and underpasses would have to be subject to the approval of Parks Canada;
- 20) there is a need now to solve the wildlife kill problems on this section of highway and that the proposed mitigation measures are the only method with assurance of success. However, further research would be desirable to determine if less drastic measures could be successful for future use elsewhere;
- 21) where a concrete median barrier is constructed, a reasonable number and size of openings would have to be provided to assist small animal passage across the highway;
- 22) if the project were not to proceed beyond km 23, wildlife mitigation measures would be required to deal with existing wildlife/vehicle accidents at km 26 near Healy Creek;
- 23) as noted in the Phase I report there is a need for an overall management plan for large animals in the Park that will take into account the incremental effects of this project on habitat and movements, and of past and future projects which have affected or may affect the species concerned. Habitat modification would be a component of this plan;
- 24) reclamation of disturbed areas would require careful investigation and appropriate mitigation measures would have to be incorporated into designs before they are finalised;
- 25) special attention would have to be given to the slopes above the Vermilion Lakes. Detailed investigation of seepage areas would be necessary to identify potential erosion zones and to design appropriate mitigation measures. In addition, care would need to be taken to minimize the potential loss of Douglas fir stands and repeated efforts might be required to revegetate. The use of retaining walls could be an appropriate method of dealing with some of the above impacts, provided aesthetic considerations are satisfied;
- 26) while complete revegetation success is not assured, the best state-of-the-art techniques would have to be utilized. Any revegetation would have to be completed to the satisfaction of Parks Canada;
- 27) in the event that the Healy Creek borrow pits are used, further investigation prior to construction would be required to develop a plan for eventual improved utilisation of this area by ungulates;
- 28) although beyond km 23 the need to replace Parkland with highway is still in question, the impact of the proponent's proposal on the montane zone has been generally minimized. Certain minor additional measures would have to be investigated before the alignment of the highway is finalised;
- 29) with the careful application of mitigation measures (such as those identified in the EIS), the residual impact on fish and water resources including sedimentation effects, would be well within acceptable limits. In addition to the measures identified in the EIS the proponent would have to develop an appropriate design to protect fish in the two unnamed creeks at km 16.5 and km 17;
- 30) a shortened construction period would reduce disruption in the Park provided environmental protection scheduling requirements are respected;
- 31) experience with Phase I to date has indicated that the stringent requirements of highway design and construction in a National Park setting can be handled successfully by the Public Works, Environment Canada, Parks Canada Committee structure established for this purpose;
- 32) the role of the Environmental Coordinator should be continued if Phase II proceeds and that his authority is sufficient for the task given the lines of communication that exist. However, if construction were to be significantly accelerated consideration should be given to assigning additional resources;
- 33) monitoring and evaluation of the effectiveness of Phase I mitigation measures should be initiated as soon as possible by Parks Canada so that design or other changes indicated could be incorporated where possible in Phase II;
- 34) Public Works should be responsible for the redesign, costs and construction of changes to any mitigation measures;
- 35) because of the special nature of the proposed mitigation measures, a formal evaluation report would be required, as an integral part of the project. The evaluation should use the results of monitoring to

- assess the effectiveness of the mitigation measures and identify any improvements necessary to remedy problems noted;
- 36) annual reports would need to be prepared during construction and include information on the manner in which the Panel recommendations and the proponent's commitments are being implemented;
- 37) in view of the possible applicability of the mitigation measures to other situations and general interest in the National Park, the evaluation and annual reports should be made public;
- 38) the overall responsibility for monitoring should rest with Parks Canada but the resources required for this work should be regarded as an integral part of the cost of the construction project;
- 39) a Committee structure similar to that used for Phase I would be appropriate for Phase II. In addition the Senior Committee should be responsible to ensure that evaluation and annual reports are prepared for all works underway on the TCH.

CHAPTER 4

RECOMMENDATIONS



4.1 THE PANEL RECOMMENDS THAT:

- 1) Construction between km 13 and km 23 be allowed subject to the following conditions which are required to make the project environmentally acceptable:
 - (i) fencing along both sides of the highway, together with one-way gates and properly located and designed over and underpasses be incorporated in the project so as to reduce road kills, improve public safety and facilitate animal movements between the valley floor and the slopes to the north;
 - (ii) further study be carried out to evolve the best design for the termination of fencing;
 - (iii) where a concrete median barrier is constructed, a reasonable number and size of openings be provided to assist small animal passage across the highway;
 - (iv) reclamation of disturbed areas be carefully investigated and appropriate mitigation measures be incorporated into designs before they are finalised;
 - (v) special attention be given to the slopes above the Vermilion Lakes by (a) carrying out detailed investigation of seepage areas to identify potential erosion zones and design appropriate mitigation measures, (b) **minimizing** the potential loss of Douglas fir stands (c) making every effort to revegetate and (d) using retaining walls, if appropriate;
 - (vi) the best state-of-the-art techniques should be utilized for revegetation;
 - (vii) certain additional measures to **minimize** impact on the montane zone be investigated before the alignment of the highway is finalised. These include further investigation of the feasibility of retaining walls to reduce encroachment in the Vermilion Lakes area and the possibility of putting the additional lanes on the north side of the existing highway to avoid the wetlands between Forty Mite Creek and the **Norquay** interchange;
 - (viii) plans be made to identify and avoid or salvage any rare or endangered species along the right of way;
 - (ix) the proponent carefully apply the mitigation measures identified in the EIS to all water bodies crossed by the TCH and, in consultation with Parks Canada, develop an appropriate design to protect the fish in the two unnamed creeks at km 16.5 and km 17;
 - (x) monitoring and evaluation of the effectiveness of Phase I mitigation measures be initiated as soon as possible by Parks Canada and changes indicated be incorporated in Phase II where possible;
 - (xi) a formal evaluation of the mitigation measures, using the results of monitoring, be prepared to assess their effectiveness and identify any improvements necessary to remedy problems noted;
 - (xii) annual reports be prepared during construction, and include information on the manner in which the Panel recommendations and the proponent's commitments are being implemented;
 - (xiii) the overall responsibility for monitoring and evaluation rest with Parks Canada;
 - (xiv) Public Works be responsible for the redesign, costs and construction of changes to any mitigation measures found necessary as a result of monitoring or evaluation;
 - (xv) a Committee structure similar to that used in Phase I be continued for Phase II. The Committees should have the same responsibilities as those recommended in the Phase I report (Appendix B). In addition, the Senior Committee should be responsible for ensuring that evaluation and annual reports are prepared and made public for all works under way on the TCH;
 - (xvi) the role of the Environmental Coordinator be continued during Phase II and if construction is significantly accelerated consideration be given to increasing resources assigned;
 - (xvii) the contractor briefing practices implemented for Phase I be continued.
- 2) In connection with the construction between km 13 and km 23:
 - (i) the exact transition section between four lanes and two lanes be determined in accordance with good engineering practices and the requirements of Park preservation;
 - (ii) the construction period be shortened to reduce disruption in the Park, provided environmental protection scheduling requirements are respected;
 - (iii) resources for the monitoring and evaluation be regarded as an integral part of the project cost.

- 3) A decision on twinning of the TCH between km 23 and km 27 be postponed until Parks Canada and Public Works have resolved:
 - (i) that a satisfactory evaluation has been carried out of the effectiveness of the Bow Valley Parkway to relieve congestion on the TCH;
 - (ii) whether the proposed modifications of this section of highway are compatible with overall highway requirements in the Park and in particular the relative priorities and benefits of any improvements that are determined as necessary to the remaining sections of the TCH in Banff National Park.

Should the km 23 to km 27 stage eventually proceed, similar conditions to those established for the km 13 to km 23 stage should apply to make this part of the project environmentally acceptable.

4.2 IT IS FURTHER RECOMMENDED THAT:

- 1) Public Works and Parks Canada work closely together on studies of optimal transportation solutions to possible future TCH congestion problems;
- 2) Transport Canada undertake such studies as are necessary to provide advice on various transportation options through the Rocky Mountains, in order that Parks Canada, Public Works and others are aware of possible future highway or other transportation demands on National Park lands;
- 3) Parks Canada identify potential resource management constraints related to transportation demands so that these can be taken into account in the development of interprovincial transportation routes and future Park policy;
- 4) an interdepartmental committee consisting of Transport Canada, Public Works and Parks Canada be established to coordinate the study of transportation matters involving the Mountain Parks;
- 5) that measures be taken to prevent wildlife/vehicle accidents in the vicinity of km 26 near Healy Creek;
- 6) in the event that the Healy Creek borrow pits are used, further investigation prior to construction be carried out to develop a plan for eventual improved utilisation of this area by ungulates;
- 7) that an overall management plan for large animals in the Park be developed to take into account the incremental effects of this project on habitat and movements, and of past and future projects which have affected or may affect the species concerned. Habitat modification would be a component of this plan;
- 8) that Parks Canada continue to actively promote the use of public transportation for visitors both to and from, and within the Park;
- 9) that further research be conducted on wildlife kill mitigation measures;
- 10) that model testing be conducted of the proposed Minnewanka interchange and the design adjusted if necessary to ensure a minimum of snow clearance problems.

ENVIRONMENTAL ASSESSMENT PANEL

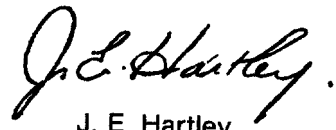
BANFF HIGHWAY PROJECT



P. J. Paradine
(Chairman)



W. R. Binks



J. E. Hartley



W. A. Ross



J. S. Tener

APPENDICES

APPENDIX “A” — PROJECT SETTING AND BACKGROUND

Project Setting

The TCH was built under authority of the Trans-Canada Highway Act which provided for general standards for its design and construction. Public Works was the department responsible for administration of this Act, and, as the federal government's construction agency, completed the TCH within the boundaries of Banff National Park in 1960.

The TCH in Banff National Park is presently a paved, two-lane highway meeting the standards set out under the authority of the Trans-Canada Highway Act. It stretches some 80 kilometres from the Park's Eastern Gate, near **Canmore**, Alberta, to Yoho National Park in British Columbia. The highway also provides for access to Jasper National Park to the north and Kootenay National Park to the south. Thus it serves as an entranceway into Canada's Rocky Mountain Parks and also as an integral part of the major east-west interprovincial highway route.

In 1885 following construction of the CP Rail line across Canada the federal government set aside a 26 square kilometre area of the Rocky Mountains, including Banff Hot Springs. Over the years the area of the Park has changed and today Banff National Park covers 6,358 square kilometres including part of the Bow Valley through which both the railway and the TCH pass.

The Bow Valley has been an important place for man's activity. Archaeological evidence indicates the presence of prehistoric people. Modern man, however, has left more tangible evidence of his presence. In addition to Banff **townsite** the remains of coal mines and settlements are apparent along with an abandoned bungalow camp and picnic sites.

Facilities, such as the Cascade hydroelectric power plant and penstocks, the highway, railway and air strip, which were developed years ago are still in service. Timber was harvested until the 1920's and grazing was permitted until the 1930's. These facilities and activities, and the many fires which have occurred in the area, have resulted in extensive changes to the landscape over the past 100 years.

Banff National Park is administered by Parks Canada under authority of the National Parks Act. Section 4 of this Act states “the Parks are hereby dedicated to the people of Canada for their benefit, education and enjoyment, subject to the provisions of this Act and the Regulations, and such Parks shall be maintained and made

use of so as to leave them unimpaired for the enjoyment of future generations.”

The unusual situation of having a road of national importance running through a National Park is the subject of a National Parks policy which “accepts, as one of the facts of economic life, that transportation routes through the Mountain Parks are required in the national interest”.

While new construction on the TCH within the Park remains the responsibility of Public Works, Parks Canada operates and maintains the highway. Any highway modifications proposed by Public Works are reviewed by Parks Canada as a matter of policy to ensure that the spirit of the National Parks Act is maintained.

Project Background

The concept of twinning the highway in Banff National Park has had a relatively long and somewhat turbulent history. Initial studies commenced as early as 1963 and during the next eight years proposals were made to twin the TCH for a distance of 120 kilometres through Banff and Yoho National Parks, and of 75 km (from km 0 to the Banff Jasper Highway junction). These studies however were done at a time when environmental considerations had a smaller role than they do today.

Environmental studies were carried out between 1971 and 1975. At this time Parks Canada conducted a public participation program on the proposal. Environmental groups strongly opposed the project and this opposition was noted by Parks Canada. At about this time there was also worldwide concern over oil shortages. With 1975 showing a decrease in traffic over 1974 consideration of twinning the highway was shelved.

After 1975 traffic growth resumed. Public Works recommenced studies and, in 1978, completed an Initial Environmental Evaluation (IEE) from km 0 to 13 providing information on various twinning alignment alternatives and their environmental effects.

The modifications proposed by Public Works to the TCH in Banff National Park would eventually result in twinning the highway between the Park's East Gate and km 27 near the Sunshine Village Ski area access. No proposal has been submitted by Public Works for any modifications beyond km 27. The twinning would result in a four-lane, limited access, divided highway.

APPENDIX “B” — PHASE I CONCLUSIONS AND RECOM- MENDATIONS

Summary of Major Conclusions

The Panel reached a number of conclusions, many of which were considered of major importance and are listed in this chapter.

The Panel concluded that:

1. The need for twinning the TCH in Banff National Park from km 0 to 13 has been demonstrated.
2. Should this project proceed and the adjoining section (km 13 to 27) be rejected or delayed, it would be imperative that the four-lane section be extended to a suitable intersection to replace the existing traffic circle at approximately km 13.5.
3. There are no viable alternatives to the twinning proposal that would meet both the need and the environmental requirements.
4. The use of public transportation should be encouraged in Banff National Park.
5. Careful design and construction techniques are required to prevent siltation and sedimentation of surface waters during the construction phase.
6. The realignment of Chinaman Creek can be completed successfully and techniques are available to produce an enhanced fish habitat in the new portion of the creek.
7. Further site specific studies on fisheries and hydrology are required before detailed design can proceed.
8. The high mortality of ungulates on the km 0 to 13 section of the TCH is unacceptable particularly in a National Park situation.
9. The construction of under/overpasses and fencing would virtually eliminate ungulate highway mortality.
10. Further study is required to determine the number and locations of under/overpasses and location and type of fencing.
11. Highway traffic safety would be enhanced by isolating ungulates from the highway.
12. Monitoring of the effectiveness of the under/overpasses and fence structures will be necessary.
13. Ungulate populations in the National Park will increase as a result of the proposed project and mitigation measures.
14. New habitat away from the highway may be required to compensate for ungulate population increases and habitat loss due to construction and fencing.
15. Consideration of the requirement for new habitat should be done in the context of a management plan for large mammals in the Park.
16. The area of montane zone required for twinning is not of such significance as to preclude construction of the project.
17. Further study of vegetation is necessary to determine if there are any rare or endangered species in the right of way.
18. Rehabilitation and revegetation of disturbed terrain, while difficult, can be accomplished satisfactorily.
19. Rehabilitation and revegetation of existing cut slopes and abandoned road-beds is required.
20. The balanced cut and fill concept proposed by Public Works is, in principle, acceptable from an environmental point of view. During the detailed design stage any residual problems relating to the extent of cuts or to provision of fill material can be resolved.
21. The need for an aesthetically pleasing highway in a National Park is clear. Visual analysis and landscaping techniques and expertise should be applied at the design stage to meet the high standards required in this sensitive area.
22. The combination of the three median types proposed by Public Works is generally acceptable and reflects a reasonable balance between aesthetics, safety, environmental considerations and the physical availability of space for the highway.
23. The proposal to twin km 0 to 13 of the TCH in Banff National Park is compatible with current national, provincial, regional and Park plans and policies.
24. Kananaskis Country and other Alberta recreational developments will not negate the need for the project. The reduction in traffic resulting from the

new recreational opportunities will be more than offset by an increase in the traffic demand created by through trips and population growth in Alberta.

25. The proposed project and the associated construction activities will not cause significant negative societal impacts.
26. A reduction in the posted speed limits on the TCH, and other roads in the Park, to a maximum of 90 km/h, will be beneficial.
27. Modifications should be made at the Park's East Gate to improve traffic flow.
28. There is a need to clearly delineate responsibilities between government agencies to allow the project to take place in an environmentally acceptable manner. A Committee with representation from agencies having responsibilities in the Park is required to ensure that decisions affecting or resulting from the project are carefully considered beforehand.
29. There is a need for close inspection and surveillance of construction operations to ensure all activities are carried out in accordance with good environmental practice to protect and enhance Park values.

Overall Conclusions

After careful review of all information provided, the Panel concludes that:

1. The need for additional highway capacity has been clearly demonstrated.
2. There are no viable alternatives to the project as proposed that would reduce negative environmental impacts.
3. The proposal is compatible with national, provincial, regional and Park plans and policies.
4. The proposed project can be constructed and operated with acceptable environmental disturbance, and
5. The residual overall environmental impact of the proposed project will not be significantly detrimental.

The Panel therefore concludes that the project to twin the TCH from km 0 to 13 may be allowed to proceed, subject to certain conditions outlined in the first recommendation in the next Chapter.

The main conditions of approval relate to the requirement for under/overpasses and fencing to isolate the highway from ungulates. There will also be a require-

ment to relocate Chinaman Creek. There is an overriding need to ensure that the project results in an environmentally acceptable and aesthetically pleasing highway, consistent with Park values. Innovative techniques and careful attention to design and construction operations will be required to ensure that this is accomplished. The Panel is confident that this can be done.

Recommendations

5.1 The Panel recommends that the project be allowed to proceed, subject to the conditions indicated hereunder:

1. Underpasses, of the type proposed by Public Works, or overpasses, be installed to permit movement of animals across the highway without interfering with highway traffic.
2. Fencing be installed to eliminate ungulate movement onto the 13 km of highway.
3. Chinaman Creek be realigned in such a manner as to preserve or enhance its value as fisheries habitat.
4. The best possible state-of-the-art techniques be utilized to ensure that design features result in an aesthetically pleasing highway. Such matters as type of fencing and proximity to the highway must not only serve their intended purpose (to keep ungulates off the highway) but also meet high aesthetic standards to preserve park enjoyment for visitors.
5. Revegetation of areas disturbed by the project be carried out in order to restore them to a state consistent with both condition (4) and the need to minimize erosion problems.
6. Rehabilitation of disturbances created by former highway construction be carried out. This would include rehabilitation and modification of existing cuts and fills and abandoned road-beds, consistent with condition (4).
7. If rare and endangered species of vegetation exist along the right-of-way, appropriate mitigation measures such as removal to another site, salvage for interpretation, or alteration of highway alignment be utilized.
8. A Committee be constituted as a mechanism to ensure that highway design and construction meet the high environmental and aesthetic standards necessary in the Park. Membership would include representatives from Public Works Canada, Parks Canada and the Environmental Protection Service of Environment Canada, and others by invitation.

Its terms of reference should include matters relating to:

- (i) facilitating design approvals,
 - (ii) environmental standards and practices,
 - (iii) aesthetic standards,
 - (iv) further studies and resulting mitigation requirements,
 - (v) special environmental conditions in contracts,
 - (vi) ensuring that the conditions contained in recommendation 5.1 of this report are implemented.
9. The Committee referred to in condition (8) also be responsible for ensuring the implementation of those studies and mitigation and enhancement measures that were identified by the proponent in the EIS and at the public meetings, consistent with condition (4) above.
 10. Certain studies be conducted prior to final design or site work. These would include studies related to the realignment of Chinaman Creek, determination of whether rare or endangered species of vegetation exist along the right-of-way and others as determined by the Committee.
 11. That the proponent designate a suitably qualified person, reporting to the Project Manager, with sole responsibilities as Environmental Coordinator for the project. Such a person will serve as the day-to-day contact for Park Wardens and other inspectors and ensure that construction operations are carried out by the contractors using good environmental practices and in accordance with the agreements reached by the Committee. The Environmental Coordinator should regularly submit reports to the Committee on matters related to the degree to which environmental requirements are being met during construction operations.
 12. The twinned highway be extended to a suitable intersection to replace the existing traffic rotary at approximately km 13.5, in the event of non-approval of, or a significant delay in, twinning the highway from km 13 to 27.

5.2 The Panel also makes the following recommendations:

1. That the proponent hold pre-tender briefings for prospective contract bidders to ensure that they

are fully aware of environmental and aesthetic requirements before submitting bids.

2. That the proponent regularly brief contractors during construction concerning environmental and aesthetic requirements.
3. That Parks Canada develop and implement a wildlife management plan which may include development of ungulate habitat in areas away from the highway.
4. That Parks Canada actively promote the use of public transportation for visitors both to and from, and within, the Park.
5. That the existing access roads to Two Jack Lake and Tunnel Mountain be closed.
6. That Parks Canada evaluate the effectiveness of under/overpasses and fencing to mitigate vehicle-animal kills, for possible utilization of similar techniques in other areas of Canada and elsewhere.
7. That special efforts be made by all parties to ensure effective communications in order to allow the project to be designed and constructed in an environmentally acceptable and aesthetically pleasing manner.
8. That in connection with the future review of the second phase of the twinning project (km 13 to 27) the proponent and his consultants actively seek information, relevant to the environmental impacts associated with the proposed twinning, from Parks Canada, and that Parks Canada officials make every effort to ensure that the proponent has access to Parks Canada's scientific or technical studies and reports that may *have* a bearing on the proposed project and its potential impacts.
9. That Parks Canada review the operation of the East Gate and that such changes in this facility as are necessary and possible to reduce congestion be reflected in the final design of the proposed twinning project.
10. That Parks Canada consider reducing the posted speed limits on the TCH, and other roads in the Park to not more than 90 km/h.

APPENDIX "C" — PANEL MEMBERS BIOGRAPHIES

MR. PHILIP J. PARADINE, CHAIRMAN

Mr. Paradine graduated with a B.Sc. (Civil Engineering) and later completed a M.Eng. (Water Resources) at the University of Ottawa.

He joined the Public Service of Canada in 1967 and held positions as a professional engineer with Transport Canada, the National Capital Commission and Environment Canada. Since 1973 he has specialized in environmental protection and assessment.

In 1978, Mr. Paradine joined the Federal Environmental Assessment Review Office (FEARO) and has been responsible for the administration of several Panel reviews; including the Banff Highway project (km O-13).

Since 1979 he has been chairing Panel reviews in the Atlantic area and is currently a Director of Panel Operations with FEARO.

MR. WYMAN R. BINKS

Mr. Binks graduated from Queen's University in 1940 with a B.Sc. in Civil Engineering.

After commissioned service with the RCAF, he joined the Department of Highways of Ontario as a soils and research engineer.

In 1951, he entered the Trans-Canada Highway Division of the Federal Public Service where he was involved in all phases of highway planning, design, construction, operations and management until his retirement in 1977 as Director of Transportation, Public Works Canada. Major projects included the Trans-Canada, the Banff-Jasper, the Mackenzie, the Dempster and the Alaska Highways.

As a dual responsibility with his highway functions, he was appointed Director of Environmental Co-ordination for Public Works Canada (1975/76). Mr. Binks is a member of the Association of Professional Engineers of Ontario.

MR. JAMES E. HARTLEY

Mr. Hartley obtained his Bachelor's degree from the College of Agriculture, University of Saskatchewan and subsequently in 1963 a Master's degree in Community

and Regional Planning from U.B.C. In 1981 he received a Master's degree in Business Administration from the University of Calgary. From 1963 to 1971 he held a number of progressively more responsible positions as a planner with regional governments in Alberta and Ontario. Since 1971 he has been with Parks Canada's western region and is currently Chief of Management Planning.

Mr. Hartley has served as a member of a commission established to select a site for Alberta's third university and as Chairman of a Task Force examining CN relocation in Jasper National Park.

DR. WILLIAM A. ROSS

Dr. Ross graduated with a B.Sc. Degree (Manitoba) and subsequently obtained a Ph.D. in Physics from Stanford in 1970.

After doing post-doctoral research work at McGill University, Dr. Ross joined the Faculty of Environmental Design, University of Calgary, in 1973.

Since that time he has been working extensively in the field of environmental science with particular interest in environmental management and energy conservation. He is currently Professor of Environmental Science and Associate Dean, Faculty of Environmental Design, University of Calgary.

Dr. Ross has lectured on various aspects of environmental sciences including environmental impact assessment. He has also directed environmental research and published numerous papers.

DR. JOHN S. TENER

Dr. Tener graduated with a B.A. (Zoology) at the University of British Columbia in 1948. He later completed a M.A. (Zoology and Botany) and a Ph.D. (Vertebrate Ecology) at the same university. One year of his Ph.D. residence was spent at Oxford University in England.

He joined the Public Service of Canada in 1949 and held various positions with the Canadian Wildlife Service including a period during 1953/54 as a biologist stationed in Banff National Park.

In 1973, Dr. Tener was appointed Assistant Deputy Minister, Environmental Management Service, Department of the Environment. From 1977 to 1979 he served as Executive Director of the Arctic Institute of North America in Calgary.

Dr. Tener retired from his position as Special Advisor to the Senior Assistant Deputy Minister, Environment Canada at the end of 1980. He is currently Chairman, Beaufort Sea Environmental Assessment Panel and is a member of the Department of Biology at the University of Calgary.

APPENDIX “D” — PARTICIPANTS IN PUBLIC R E V I E W

1. PARTICIPANTS AT PUBLIC INFORMATION SESSIONS

A. Groups

1. Alberta Trucking Association
2. Alberta Wilderness Association
3. Federation of Alberta Naturalists
4. National and Provincial Parks Association of Canada
5. Trans-Canada Highway West Association
6. University of Calgary Students, Faculty of Environmental Design

B. Government Agencies

1. Parks Canada
2. Public Works Canada (proponent)

C. Individuals

R. Aitken (8.2 consultant)
 W. Bowes (8.2 consultant)
 P. Clarkson
 R. Coote (A.6)
 M. Copeman (A.6)
 P. Duck
 T. Duguid (A.6)
 T. Forseth (A.5)
 V. Geist
 R. Glaholt
 J. Halprin
 S. Hendler
 S. Herrero (A.4)
 N. Huculak (B.2)
 P. Lange (B. 1)
 B. Leeson (B. 1)
 J. Mahoney (A.6)
 M. McCallum (A.6)
 G. Morgan (8.2 consultant)
 J. Patterson
 D. Reid (B.2)
 J. Robertson
 K. Scott (A. 1)
 R. Sloan (A.2)
 R. Smith
 W. Smythe
 G. Solty
 L. Sperrow
 H. Srigley
 L. Sutterlin
 R. Thomson (8.2)
 H. Turnbull
 K. Van Tighem
 A. Westhaver
 C. White

P. White
 L. Zwicky

2. WRITTEN BRIEFS SUBMITTED TO THE PANEL DURING TECHNICAL REVIEW OF EIS

A. Groups

1. Banff/Lake Louise Chamber of Commerce
2. Bow Valley Naturalists
3. Federation of Alberta Naturalists
4. University of Calgary Students - Faculty of Environmental Design

B. Government Agencies

1. Government of Alberta - Minister of Federal and Inter- governmental Affairs
2. Environment Canada including Parks Canada and Fisheries and Oceans Canada

C. Individuals

P. Duck
 P. Laird
 G. Solty

3. PRESENTATIONS TO THE PANEL AT THE PUBLIC MEETINGS

A. Groups

1. Alberta Trucking Association
2. Banff/Lake Louise Chamber of Commerce
3. Bow Valley Naturalists
4. Federation of Alberta Naturalists
5. Sierra Club of Western Canada
6. University of Calgary Students - Faculty of Environmental Design

B. Government Agencies

1. Environment Canada
 - a) Parks Canada
 - b) Canadian Wildlife Service
2. Public Works Canada (proponent)
3. Transport Canada

C. Individuals

R. Aitken (8.2 consultant)
 A. Anderson (8.2)
 P. Boswell (A.2)
 W. Bowes (B.2 consultant)
 R. Crosby
 T. Duguid (A.6)
 R. Galarneau (B.3)
 D. Harvey
 G. Holroyd (B. 1 b)
 N. Huculak (B.2)
 R. Jakimchuk (8.2 consultant)

H. Kariel (A.5)
 P. Kariel (A.5)
 P. Kehoe (8.3)
 C. Kingman
 P. Lange (B. 1a)
 B. Leeson (B. 1a)
 H. Locke
 A. Macpherson (B. 1)
 J. Mahoney (A.6)
 M. McCallum (A.6)
 M. McIvor (A.4)
 G. Morgan (8.2 consultant)
 L. Paterson (8.2 consultant)
 J. Peatfield
 B. Pitman (A.6)
 D. Reid (8.2)
 J. Rouse (B. 1a)
 K. Scott (A. 1)
 G. Solty
 D. Street (B. 1 a)
 R. Thomson (B.2)
 P. Vermeulen (A.5)
 C. Wallis (8.2 consultant)
 G. Wilkie (A.3)

M. Winsby (8.2 consultant)
 S. Zoltai (B. 1)

4. WRITTEN BRIEFS PRESENTED TO THE PANEL AT THE PUBLIC MEETINGS

A. Groups

1. Alberta Trucking Association
2. Banff /Lake Louise Chamber of Commerce
3. Bow Valley Naturalists
4. Federation of Alberta Naturalists
5. University of Calgary Students, Faculty of Environmental Design

B. Government Agencies

1. Environment Canada, including Parks Canada and Fisheries and Oceans Canada
2. Transport Canada

C. Individuals

G. Solty
 L. Vaxvick

5. WRITTEN BRIEFS SUBMITTED TO THE PANEL AFTER PUBLIC MEETINGS

1. Alberta Wilderness Association
2. P. Duck

APPENDIX "E" — BIBLIOGRAPHY

- Guidelines for the preparation of an Environmental Impact Statement for improvements to the Trans-Canada Highway in Banff National Park, September, 1978, issued by the Banff Highway Environmental Assessment Panel.
- Environmental Impact Statement for Proposed Improvements to the Trans-Canada Highway in Banff National Park, km 13 to Sunshine Road, Volumes I and II, August 1981, prepared by Thurber Consultants Ltd. and issued by Public Works Canada.
- Transcripts of public information sessions held in Banff (September 29, 1981) and Calgary (September 30, 1981).
- Compendium of comments presented to the Panel concerning Public Works Canada's Environmental Impact Statement (EIS) on the proposed improvements to the Trans-Canada Highway in Banff National Park (km 13-27), November 13, 1981 and November 25, 1981, issued by the Panel Secretariat.
- Proposal for access to Mt Rundle Viewpoint from the Vermillion Lakes Rd. and statistical data on animal/vehicle accidents for the years 1978, 1979 and 1980 on three sections of the TCH submitted to the Panel by Public Works Canada and issued by the Panel Secretariat on December 9, 1981.
- Responses to comments on proposed improvements to the Trans-Canada Highway in Banff National Park (km 13-27), December, 1981 submitted by Public Works Canada and issued by the Panel Secretariat.
- Principles and details of animal fencing and crossing structures proposed for Trans-Canada Highway twinning in Banff National Park, November 1981, submitted by Public Works Canada and issued by the Panel Secretariat.
- Compendium of written submissions to the Panel presented during the public meetings on Banff Highway Project, Phase II and of other submissions received before February 8, 1982, prepared by the Panel Secretariat.
- Transcripts of public meetings held in Calgary (January 11 and 12, 1982) and in Banff (January 14 and 15, 1982).
- Banff Highway Project (East Gate to km 13), Report of the Environmental Assessment Panel, October, 1979, issued by the Federal Environmental Assessment Review Office.
- Vermilion Lakes, Banff National Park, an Introductory Study, 1978, prepared by the Bow Valley Naturalists with the support of Parks Canada.
- Trans-Canada Highway, Wildlife Mitigation Measures, Banff National Park (East Gate to Banff Traffic Circle), November 1980, prepared by Parks Canada Western Region.
- Pacific Rim Highway Access Study Phase I Report, 1979, prepared by Transport Canada.
- Documents tabled at the public meetings:
 1. Fatal crashes on TCH in Banff National Park, tabled by K. Scott, Alberta Trucking Association
 2. Habitat loss in the montane zone of Banff National Park, tabled by G. Holroyd, Canadian Wildlife Service
 3. Outline of duties for the Environmental Coordinator, TCH twinning Banff National Park, tabled by P. Lange, Parks Canada
 4. Revised construction schedule, km 13 to km 27, tabled by D. Reid, Public Works Canada
 5. Design for cattle guard, tabled by G. Solty

APPENDIX “F” — TRAFFIC ANALYSIS AND LEVELS OF SERVICE

The various levels of service were described as follows in the EIS.

Level of Service A is the highest quality of service a particular class of highway can provide. It is a condition of free flow in which there is little or no restriction on speed or manoeuvrability caused by the presence of other vehicles.

Level of Service B is a zone of stable flow. However, the operating speed is beginning to be restricted by other traffic. Density is under 12 v/km (20 v/mi), restriction on manoeuvring is still negligible, and there is little probability of major reduction in speed or flow rate.

Level of Service C is still a zone of stable flow but at this volume and density level most drivers are becoming restricted in their freedom to select speed, change lanes, or pass. Operating speeds are still in the range of 2/3 to 3/4 of maximum.

Level of Service D approaches unstable flow. Tolerable average operating speeds are maintained but are sub-

ject to considerable and sudden variation. Freedom to manoeuvre and driving comfort are low because lane density, and the probability of accidents has increased.

The upper limit of Level of Service E is the capacity of the facility. Operation in this zone is unstable; speeds and flow rates fluctuate, and there is little independence of speed selection or ability to manoeuvre. Since headways are short and operating speeds subject to rapid fluctuation, driving comfort is low and accident potential high.

Level of Service F describes forced flow operations. Speed and rate of flow are below the levels attained in Zone E and may, for short time periods, drop to zero.

Capacities of the Trans-Canada Highway for various levels of service are given on the Chart (Figure 7) as per the EIS. It was noted during the public meetings that the actual capacities that can be achieved in practice may vary, dependent upon the type of traffic and other conditions.

Projected 30th Highest Hour Traffic Volumes T.C.H. Mt. Noquay to Bow Valley Parkway

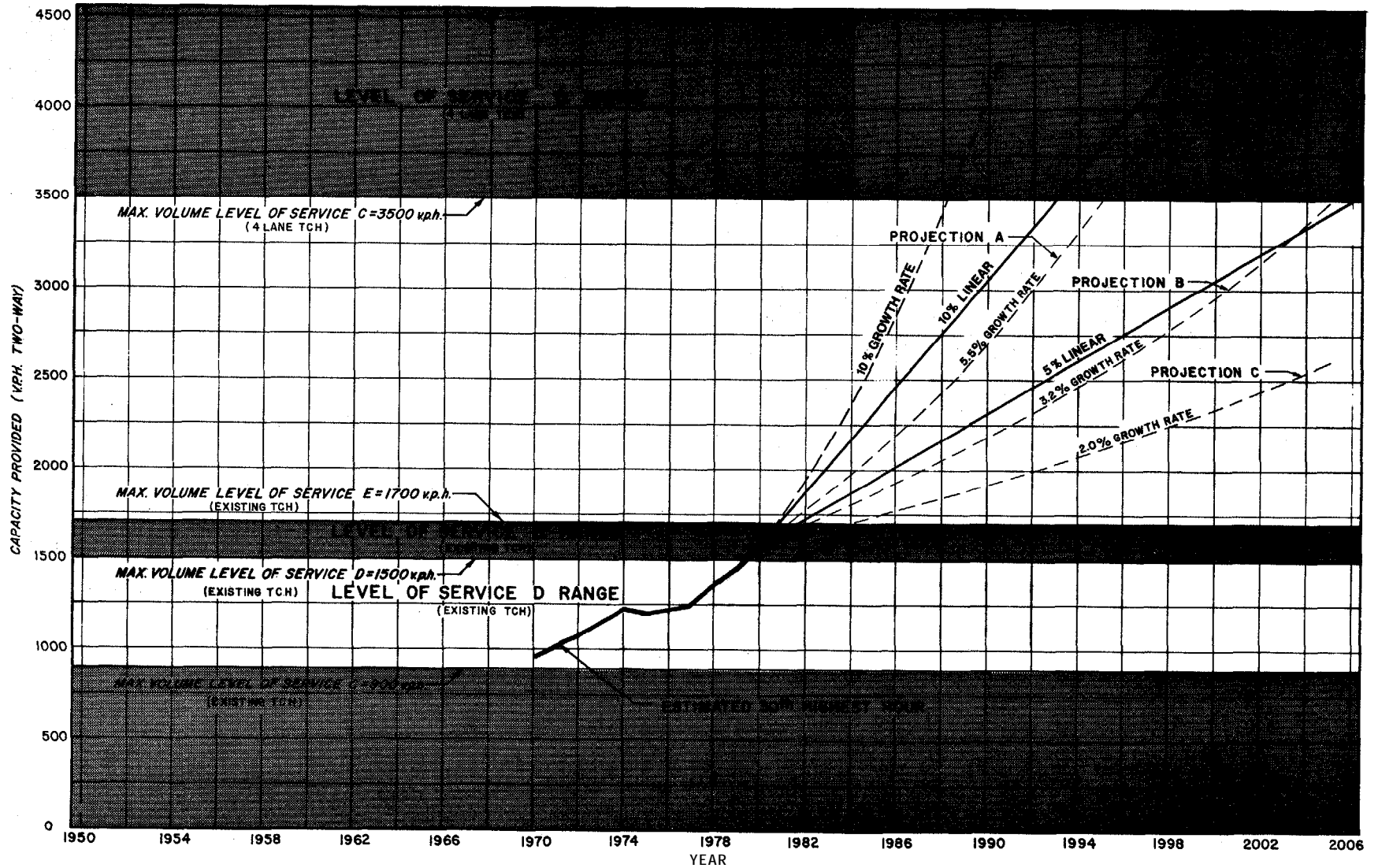


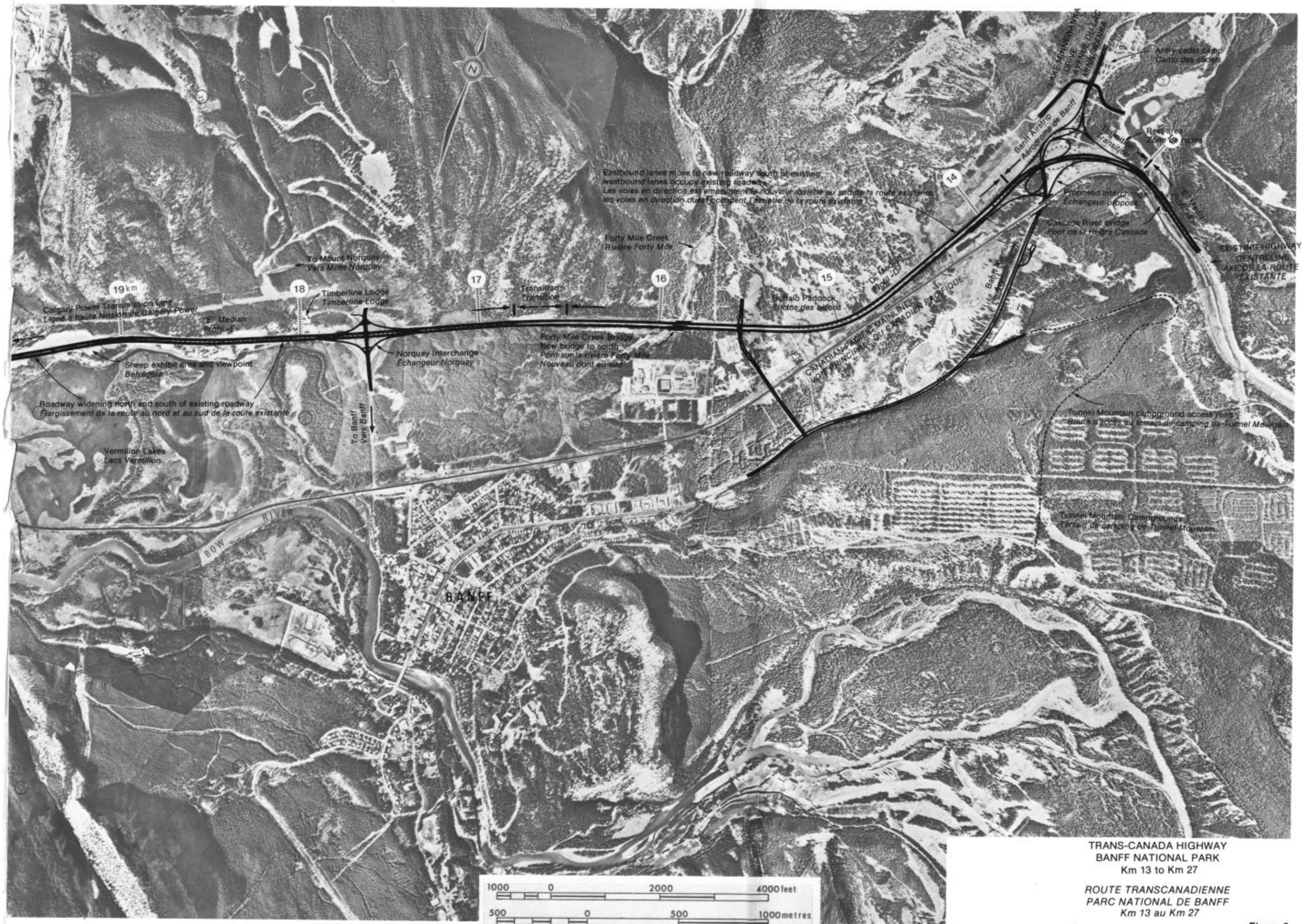
Figure 7

APPENDIX “G” — ACKNOWLEDGEMENTS

The Panel wishes to thank the public and members of government agencies who contributed to the review, as well as the following Panel staff for their assistance:

G. Riverin
H. Lamoureux
G. Crites

Panel Secretary
Panel Secretariat
Secretarial Support



TRANS-CANADA HIGHWAY
BANFF NATIONAL PARK
Km 13 to Km 27

ROUTE TRANSCANADIENNE
PARC NATIONAL DE BANFF
Km 13 au Km 27

Figure 8

